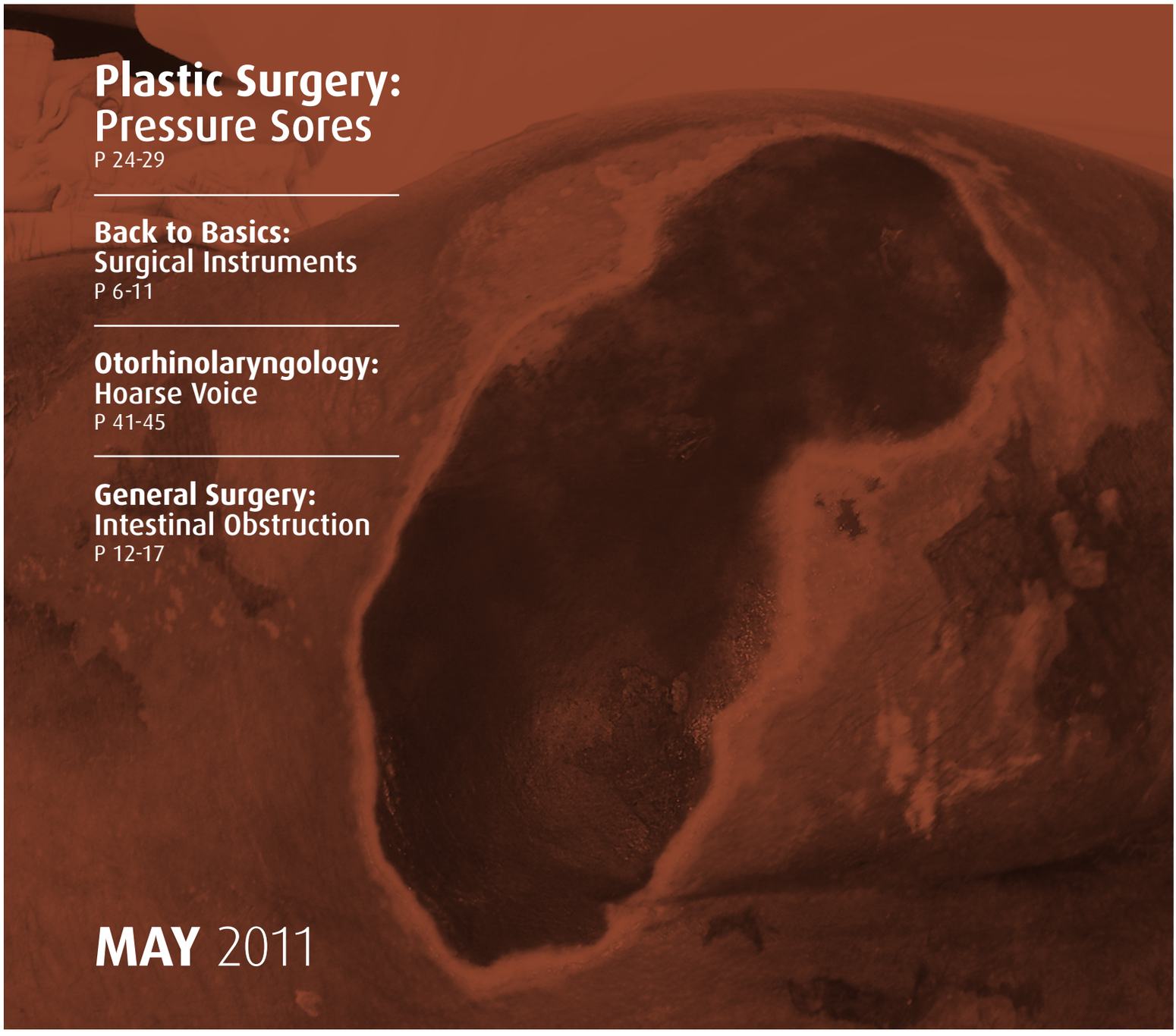
123 Doc EDUCATION

CORE SURGERY JOURNAL

Volume 1, Issue 4



MAY 2011

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Volume 1, Issue 4

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CORE SURGERY JOURNAL

Volume 1, Issue 4

Dear Prospective Authors

Thank you for considering the submission of an article to 'Core Surgery'. This is a new journal aiming to educate and inform surgical trainees about relevant 'core' subject topics. Each issue will cover a topic from selected subspecialty fields: General Surgery, Trauma and Orthopaedic Surgery, Plastic and Reconstructive Surgery, Otorhinolaryngology and Neck Surgery, Neurosurgery, Urology, Paediatric Surgery, Cardiothoracic Surgery and Critical Care. Articles will be required to be broad enough to help with preparation for the intercollegiate MRCS examination but also focus on key hints and tips on becoming a higher surgical trainee. Authors are encouraged to submit articles on relevant topics to core surgical training.

Types of Article

Manuscripts are considered under the following sections:

1) Case based discussions
2) Practical procedures
3) Audit
4) Review articles
5) Course reviews
6) Research papers

Submission of Manuscript

Submissions will only be accepted via email and must be accompanied by a covering letter. Please submit your article to **coresurgicaltrainee@googlemail.com.** The covering letter must include a statement that all authors have contributed significantly and accept joint responsibility for the content of the article. In addition any financial or other conflict of interest must be declared.

Manuscript Style

Submissions should follow the style of the Vancouver agreement detailed in the International Committee of Medical Journal Editors' revised 'Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication', as found at **http://www.ICMJE.org/**

References

All articles must be referenced appropriately. The Vancouver system of referencing should be used; details can be found at h**ttp://www.imperial.ac.uk/Library/pdf/Vancouver_referencing.pdf.** References should be cited using superscript numerals in the order in which they appear. The list of references should reflect this order and names of journals should be abbreviated in the style used in Index Medicus **ftp://nlmpubs.nlm.nih.gov/online/journals/ljiweb.pdf.**

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Format of Articles

Guidelines for the format of respective article types are as follows:

Case Based Discussions

Should be about 1000-1500 words long and should focus on clinical assessment, differential diagnosis or treatment. The basic structure should be as follows:

Abstract: The salient points of the case and discussion.

Case history: Including the initial presentation, clinical setting and problem, investigation and treatment.

Discussion: Covering the critical aspects of the management and the treatment options.

Practical Procedures

Should be about 1000-1500 words long. Although not essential it is highly advantageous if pictures and diagrams are supplied to illustrate the most salient points. Articles should be set out as follows:

- History and pathology
- Indications and contraindications
- Gaining informed consent/explaining procedure to patient
- Equipment required
- Draping/sterile field preparation
- Patient positioning and relevant anaesthetic points
- Documentation of procedure
- Recording of complications and management of such

Audit

Articles should be 1000-1500 words long and of high quality. Completed audit cycles are strongly preferred as are audits which have led to guideline development.

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Review Articles

The topic should be relevant to core surgical trainees, and a maximum of 2500 words long. The review should include an abstract, and a clinical vignette of a case relevant to the topic. The aim of including a clinical case is to provide a focus for discussion, and to ensure that the review is relevant and useful to our readership.

Course Reviews

Should be a maximum of 1000 words and review a course which is either mandatory or desirable for core trainees and junior higher surgical trainees.

Research Papers

Although the publication of research articles is not a core aim of the journal, Core Surgery welcomes research submissions if thought to be of interest to the readership. Articles should be written using the following headings (title page, abstract, introduction, methods, results, discussion, references). They should be a maximum of 2500 words of text including abstract, 30 references, 3 illustrations or figures. The abstract should be a maximum of 250 words and use the following headings (introduction, methods, results, conclusion). The title page should contain the title of the paper, the full names of the authors, the addresses of the institutions at which the research was carried out and the full postal address, email address and telephone number of the corresponding author.

MCQs / EMQs (All Articles)

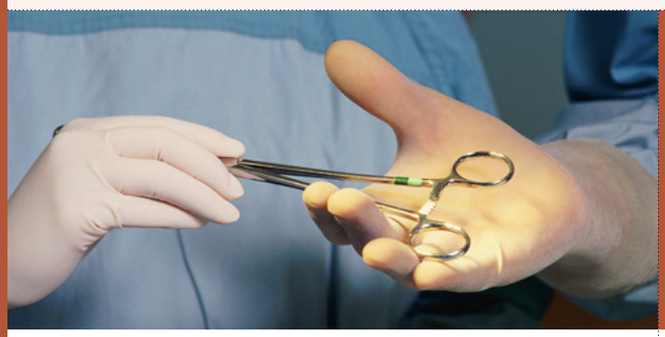
Please note that all articles should be submitted with five multiple choice questions (MCQs) or extended matching questions (EMQs) attached, in the style of the Member of the Royal College of Surgeons (MRCS) 'Part A' examination. These questions should have answers and brief teaching notes/discussion included. Examples of the requirements for question style can be found here: **http://www.intercollegiatemrcs.org.uk/old/pdf/samplequestions_MCQ.pdf**

Summary

Articles considered for publication will be sent for review by our panel of consultants and surgical trainees. We wish you every success with your submission. Please contact the editorial team with any questions.

SURGICAL INSTRUMENTATION

Karl Frederick Braekkan Payne and Syed Amer Hussain Andrabi



Surgical Instrumentation.
Back to Basics.

Introduction

The dictionary defines surgery as "the treatment of injuries or disorders of the body by incision or manipulation, especially with instruments". For a surgeon, the instruments he uses are an extension of his/her hands, and quite literally the "tools of the trade". They must be both ergonomically friendly and fit for purpose.

This article will focus on the instruments found in a large basic surgical tray; discussing their names and functions. It should be noted that hospitals may have different surgical trays, and some of the instruments discussed below may not be encountered by one surgical trainee, and other instruments routinely used by another trainee may have been omitted.

Classifying Surgical Instruments

A useful way to group surgical instruments is to classify them according to their function. Broadly they can be split into the following groups:

- Instruments to cut, incise or dissect tissue
- Instruments to retract tissue
- Instruments to grasp, hold or occlude tissue

Instruments to Cut, Incise or Dissect Tissue

Instruments designed to cut or incise/dissect tissue are generally either a scalpel or knife, or scissors. Scalpels can be used to cut skin, superficial or deep tissue, and for each role, a different knife handle and size/shape of blade is used. Starting from a 10 blade; as a general rule, the higher the number, the larger the blade (Figure1). As a trainee you need to know which blade fits which operative incision, for example; a large incision such as a midline laparotomy, will need a 20 or 22 blade, while smaller incisions will warrant a 10 blade. A procedure such as excision of a minor cutaneous lesion will warrant the thinner 15 blade, allowing more manoeuvrability and control of the incision, and an arteriotomy requires the straight 11 blade. Blade sizes up to 15 need a number 3 handle, and larger blades use a number 4 handle (Figure 1).

Scissors come in many shapes and sizes; their tip can be either blunt or sharp, and also straight or curved. Scissors do not serve different purposes i.e. those used to cut a suture material are not then used to cut tissue, in this respect one should observe the design variations present in order to be fit for purpose. For example; the straight Mayo scissor (Figure2) is used to cut suture material, while the curved ended Mayo scissor is used to cut heavy tissue. The Metzenbaum and McIndoe scissors (Figure3), which have a longer narrower middle section and smaller jaws, are the scissors used most often to perform more delicate tissue dissection.

Figure 1. Scalpel handle and blades. From left: number 3 handle, number 4 handle, blade selection.

Figure 2. Mayo Scissors. Used to cut suture or dressing material, or used to dissect tissue.

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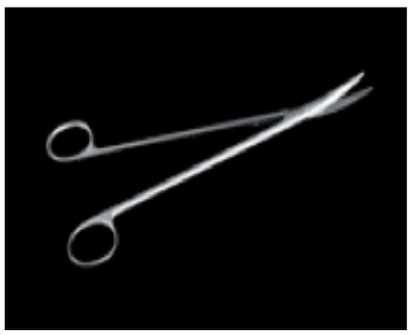

Figure 3. McIndoe Scissors. Used to dissect along tissue planes.

Instruments to Retract Tissue

A retracting instrument is designed to hold back tissue or organs, to improve the exposure of a body cavity or increase the operative view through an incision. They are further classified as being manual i.e. constantly held in place, or self-retaining i.e. designed to keep themselves open.

Manual retractors can be sub-divided into larger organ/cavity-retracting devices, and smaller tissue retractors. The Deaver (Figure4), Morris (Figure5), and Kelly (Figure6) retractors are examples of organ or large cavity retractors, which can be contrasted with the smaller Langenbeck retractor (Figure7). An important feature of a retractor is the bottom inward lip (Morris, Langenbeck), which will allow multiple tissues planes to be gripped and elevated to improve the field of view.

Self-retaining retractors can be handheld, or externally attached to the operating table. The handheld variety are used to open skin incisions and maintain taught tissue while dissecting subcutaneously and deep to fascia. In order of size they include the Wests, Travers and the Norfolk and Norwich retractor. The Omnitract, is an example of a larger self-retaining retractor which uses a pillar attached to the operating table, with curved arms, to which various sized and shaped retractors can be clamped and adjusted at different angles; this is utilised in larger operating fields, such as holding back abdominal viscera in a laparotomy. Other examples of smaller instruments, designed to retract skin, although not present in the basic surgical tray, include Skin-hooks and the so-called Cats-paw retractor.

Figure 4. Deaver retractor. A retractor designed to retract the liver during an open cholecystectomy.

Figure 5. Morris retractor. A large retractor used to grip greater portions of tissue, such as in the incision used in a laparotomy to expose the abdomen.

Figure 6. Kelly retractor. A large curved retractor used to hold back abdominal organs.

Figure 7. Langenbeck retractor. A retractor used to hold open wound edges or margins of tissue. A familiar site to any assistant, and often used in a pair to widen the operating field for the chief surgeon.

SURGICAL INSTRUMENTATION

Karl Frederick Braekkan Payne and Syed Amer Hussain Andrabi

Instruments to Grasp, Hold or Occlude Tissue

Instruments designed to grasp, hold or occlude are called forceps. These are further classified by function as: tissue forceps, haemostat forceps and towel/sponge forceps. Forceps vary in their size, but more notably by the style of the jaws.

Tissue forceps can be thumb forceps i.e. a "tweezer" type design, or locking forceps, otherwise known as a clamp. Thumb forceps may be plain, grooved jaw forceps (Figure 8), toothed, such as Gillies forceps (Figure9), or with specifically designed jaw grooves such as DeBakey (Figure10) forceps. The design of the jaw will impact how and when these forceps are used, as they exert different pressure upon the tissue.

Forceps are also used to grasp delicate soft tissue, such as Allis, Babcock or Pennington forceps (Figure 11,12), or grip tougher tissue, as with Littlewoods forceps (Figure 13). With the above the variation in tip design should be observed as being specific to the task they serve.

Haemostat forceps are designed to occlude or grasp vessels, ducts or other soft tissue. They can be small, such as Mosquito forceps (Figure 14), or larger, such as Kelly, Dunhill or Spencer Wells forceps (Figure 15), which are often used for tissue dissection. The Roberts forceps (Figure 16) have notable long jaws, and are used for occluding larger structures.

Sponge and Towel forceps (Figure 17,18) are used for preparation of the patient; either sterilising the skin, or positioning drapes around the operating field. Other forceps are designed for a specific purpose; such as needle holding (Figure 19), or passing suture material around a vessel or other structure (Figure 20). Further attention should be paid to the retaining system used by different surgical instruments. The majority of forceps on the general surgical tray will use a ratchet lock i.e. interlocking metal triangles that can be released using a finger-thumb motion. Other retaining systems include a cam-ratchet, as used by many self-retaining retractors.

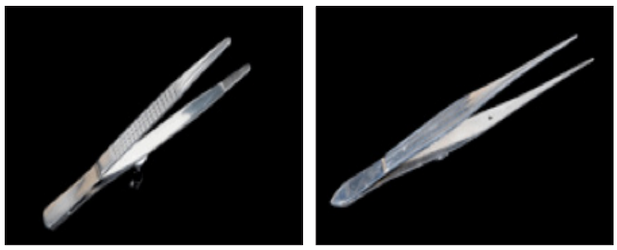

Figure 8. Plain forceps (fine and heavy). These are non-toothed forceps, with grooved jaws. These are used for general manipulation of soft tissues.

Figure 9. Gillies forceps. These are forceps with teeth at the end of the jaw. Useful to grasp tough tissue such as skin i.e. when suturing a wound. Available in a variety of jaw length and sizes.

Figure 10. DeBakey forceps. These are atraumatic forceps used to handle delicate tissue such as a vessel wall or bowel. Note the vertical direction and pattern of the grooves on the jaws.

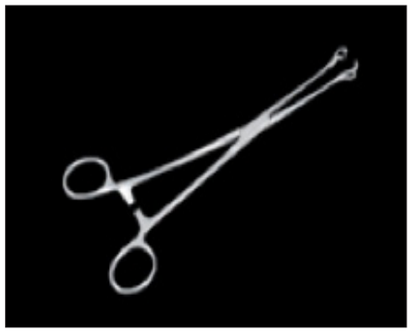

Figure 11. Babcock forceps. A forcep used to grasp delicate tissue, such as fallopian tube or small intestine. It enables the surgeon to hold the tissue without compressing it.

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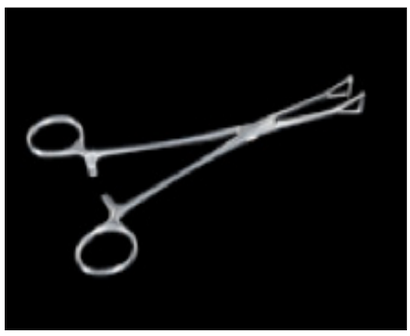


Figure 12. Pennington forceps, Duval forceps. Used to hold intestinal tissue, and other soft tissue.

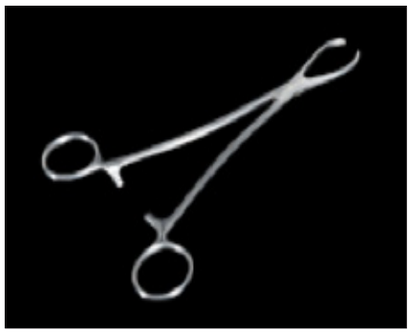


Figure 13. Littlewoods forceps. Used for gripping fascia or other soft tissue.

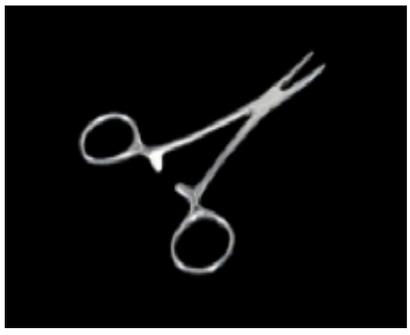
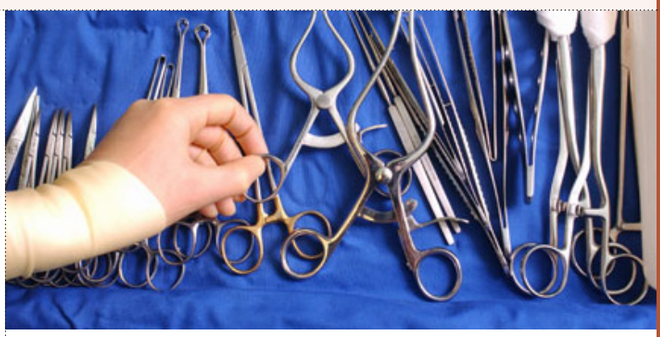


Figure 14. Mosquito forceps, Artery Forceps. Small forceps used to clamp arteries or veins prior to tying off. Curved or straight ended.



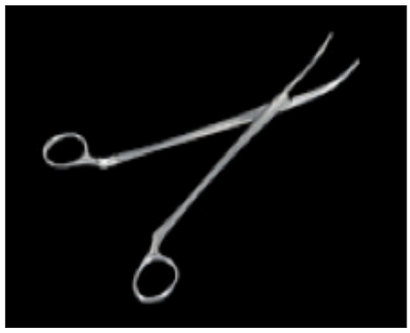


Figure 15. Spencer Wells forceps. A general purpose medium to large sized forcep. Used for vessel/duct occlusion and tissue dissection.

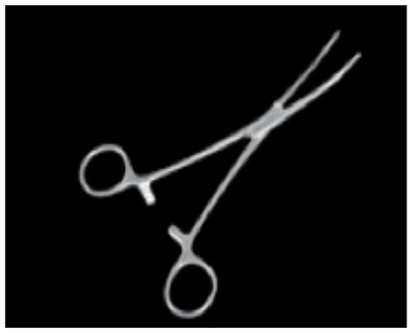


Figure 16. Roberts forceps. A large forcep used during ligation of larger pedicles, such as in bowel resection.

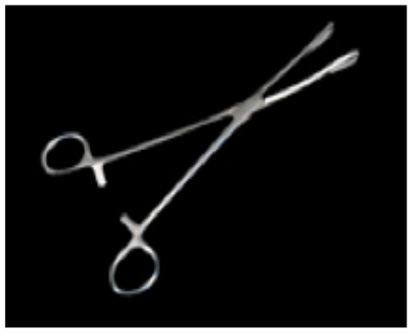


Figure 17. Sponge forceps, Foerster forceps. Used to grip the sponge or gauze when cleaning the skin or a wound.

SURGICAL INSTRUMENTATION

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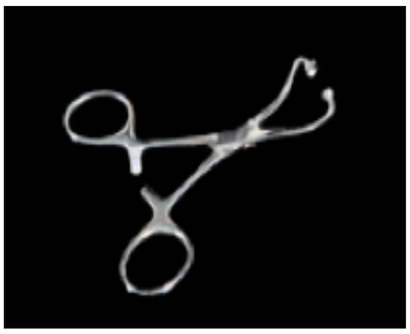

Figure 18. Towel forceps, Backhaus forceps. These are used to fix together the prep drapes used to cover the patient. They can have blunt or sharp ends.

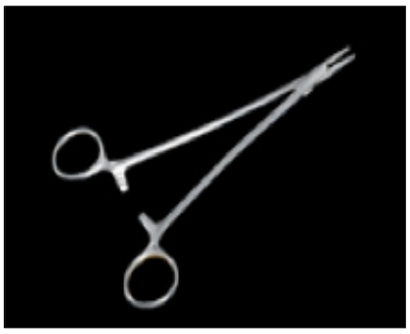

Figure 19. Needle Holding Forceps, Crile-Wood forceps, Mayo-Hegar foceps. Used to hold the needle on suture material. These have shorter wider jaws compared to tissue forceps, and come in long or short varieties.

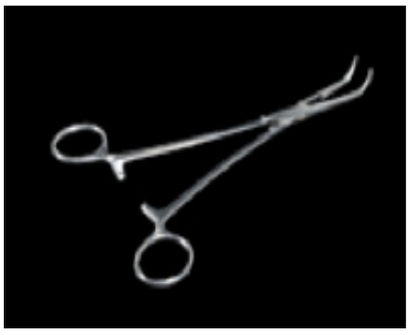

Figure 20. Lahey forceps, O'Shaughnessy forceps. Used to dissect, or pass suture material around a structure, such as a blood vessel or the cystic duct in a cholecystectomy. Note the near right angled jaws.

Conclusion

As a surgical trainee you will be expected to know both instrument names, and their role and limitations. With advancement in surgical technique and differing procedures, comes the advent of newly designed surgical instrumentation.

This article discussed only a small number of the surgical instruments available, outside of the scope of this article are the instruments used by individual specialities and how they are further suited to meet their needs. The only way to know how and when to use an instrument is to watch and assist with surgery in theatre, but revising the basics is always good preparation.

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1. Oxford English Dictionary, Online Edition. **http://oxforddictionaries.com**
2. Williams NS, Bulstrode CJK, O'Connell PR. Bailey & Love's Short Practice of Surgery, 25th Edition. Hodder Arnold publishing 2008; Appendix 1
3. Wells MP, Bradley M. Surgical Instruments A Pocket Guide. W.B. Saunders 1998

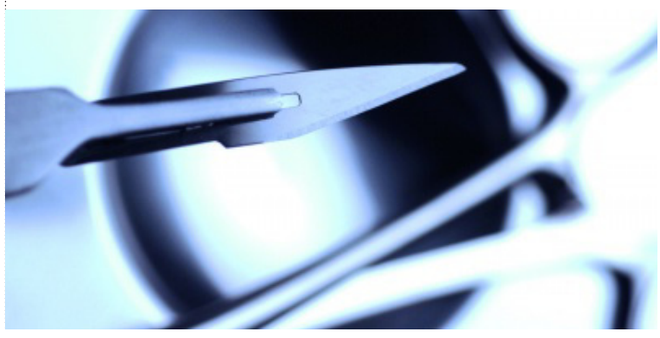
MCQ's

Question 1: You are a surgical trainee scrubbed with your consultant in theatre, about to start a large mid-line laparotomy. Your task is to cut the skin. You ask the scrub nurse for a scalpel and she asks which size blade you require. What do you reply?

1. 11 blade
2. 5 blade
3. 20 blade
4. 15 blade
5. 30 blade

Question 2: You have cut the skin and are dissecting down to the rectus sheath. Suddenly your Consultant's phone rings and he has to take an urgent call. He instructs you to continue. You have no assistant at this point, what would be the best choice of self-retaining retractor to enable you to continue?

1. Langenbeck retractor
2. Deaver retractor
3. Morris retractor
4. Kelly retractor
5. Travers retractor



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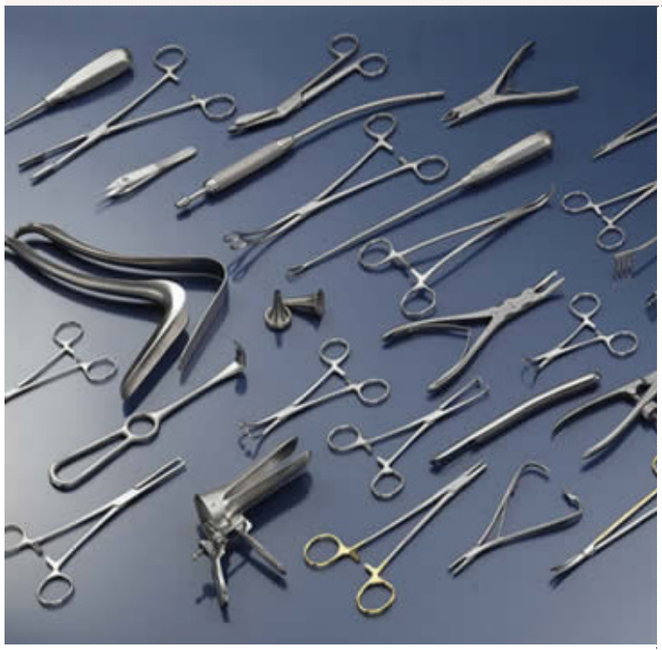

Question 3: It transpires that you are resecting the small bowel. Which forceps are appropriate to grip the intestine as your Consultant dissects around it?

1. Pennington forceps
2. Littlewoods forceps
3. Lahey forceps
4. Backhaus forceps
5. Foerster forceps.

Question 4: You have finished the operation and your Consultant asks you to close the abdominal skin wound, which one of the following forceps do you ask the scrub nurse for?

1. Mosquito forceps
2. Rochester-Pean forceps
3. Gillies forceps
4. Babcocks forceps
5. Littlewoods forceps

Question 5: After placing your first suture you realise you have no instrument to cut the suture material. What instrument do you ask for?

1. Scalpel
2. Mayo scissors
3. McIndoe Scissors
4. Metzenbaum scissors
5. Stitch cutters

Answers

Answer 1

Number 3 is correct. The correct blade to use is the 20 blade (although a 10 blade would be permissible for smaller abdominal incisions). This is the blade used to cut skin in larger incisions, with the 15 blades being too small for such an incision. There is no such size blade as a 5 or 30.

Answer 2

Number 5 is correct. In this unlikely scenario you require a self retaining tractor, such as a Travers retractor, thus leaving your hands free to continue dissecting down. The other retractors on the list are manual retractors and would leave you one handed, unless you could persuade the scrub nurse to help you!

Answer 3

Number 1 is correct. The Pennington forceps are designed to grip the bowel while spreading even pressure across the tissue. The other forceps on this list would either be too firm, or are used in prepping the patient.

Answer 4

Number 3 is correct. The Gillies forceps are thumb forceps with a toothed jaw specially designed for gripping skin. The other forceps on this list are all clamp forceps, designed for holding or occluding tissue, and therefore not suitable when suturing up a wound.

Answer 5

Number 2 is correct. The correct choice in this instance are the Mayo scissors. The other scissors are used for tissue dissection or tissue cutting, a scalpel would not be used to cut suture material, and a stitch cutter is used post-operatively.

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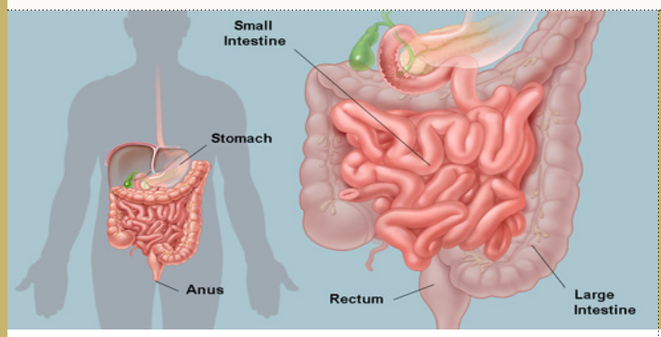
INTESTINAL OBSTRUCTION

Nomaan Sheikh



Intestinal Obstruction.
General Surgery.

Introduction

Intestinal obstruction is defined as any mechanical or functional disruption in intestinal motility that leads to a halting of the forward passage in the gut. Nearly 30% of all admissions in the UK to surgical assessment units are for suspected intestinal obstruction [1].

This can be classified according to its site – high or low i.e. small or large intestines and can be divided into two groups; either functional or mechanical.

Another form of classification of causes is looking at the relationship of obstruction to the bowel wall, is it?

1. external to the intestinal wall e.g, volvulus, adhesions
2. in the wall of the intestine e.g, crohn's strictures, tumours
3. in the lumen e.g, gallstones, impacted stool

Some of the common causes of large and small bowel obstruction in adults are laid out in table 1:

Large Bowel	Small Bowel
Tumour	Adhesions (> 60%)
Volvulus	Hernia
Hernia	Crohn's strictures
Faecal impaction	Tumour
Inflammatory Bowel disease	Volvulus

The signs common for obstruction are

1. Abdominal colicky pain – not present in pseudo obstruction
2. Abdominal distension
3. Absolute constipation – no passage of faeces and flatus
4. Nausea and vomiting

Most patients admitted have abdominal pain with distension. Vomiting may be an early or late sign depending on the site of obstruction. Faeculent vomiting tends to be late in onset and is associated with large bowel obstruction. Before a diagnosis of functional obstruction is made, mechanical causes have to be rules out.

The management of any acute bowel obstruction first involves correct diagnosis of the condition and its cause.

Pathophysiology

In mechanical obstruction, the distal intestine rapidly collapses after emptying. Any bowel proximal to the obstruction point becomes dilated by food, swallowed air and ongoing gastric, pancreatic, bile and intestinal secretions. Peristaltic activity still occurs trying to push these contents past the blockage. This is what gives the characteristic colicky pain[2]. As the proximal bowel distends, the patient develops abdominal distension. The bowel wall becomes more oedematous and the blood supply to wall can become impaired. If this happens mucosal ulcerations may develop, which can eventually lead to perforation and peritonitis. Also, weakening of mucosal barriers can allow fluids, toxins and bacteria to move into the peritoneal cavity. Ischaemic bowel leads to necrosis, again leading to perforation and sepsis.

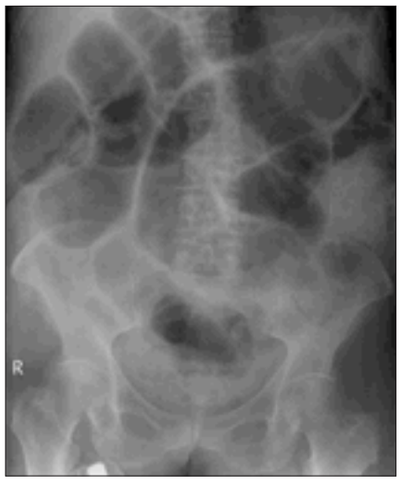


Figure 1 – Abdominal X ray of obstruction

In a functional obstruction (also termed paralytic ileus or pseudo obstruction by some), as there is a loss of peristalsis rather than an obvious blockage, colicky abdominal pain is not a significant feature. Although the cause is not fully understood, it is thought to be due to an imbalance in the autonomic innervation of the gut 3. The same process of distension, oedema and toxin shift can occur with severe loss of fluid and electrolytes in the gut known as third space loss. Paralytic ileus is a common problem in the post operative care of surgical patients, particularly following bowel surgery and it is important to recognise it early and mange it appropriately.

INTESTINAL OBSTRUCTION

Nomaan Sheikh

The following cases show some of the management of certain types of obstruction.

Case 1

A 73 year old lady Mrs O, is admitted to the surgical assessment unit via the emergency department with suspected acute large bowel obstruction. She has recently been diagnosed with Stage 4 ovarian cancer.

Obstruction in patients suffering from ovarian cancer is common, some research suggesting anywhere between 15-50 % of Stage 3-4 cancer patients developing a malignant bowel obstruction [4]. It is also one of the major causes of death in this population group. However, this does not rule out other causes for obstruction, some surgical series citing a rate of 23% for non malignant causes of obstruction in ovarian cancer patients, predominantly adhesions 5. The mortality and morbidity from obstruction is significant and good management with a palliative approach, if appropriate, is important.

On examination, Mrs O shows physical signs of dehydration, is anorexic with an obviously distended abdomen, which, on palpation, is soft with minimal tenderness. There is a palpable mass in the left iliac fossa and on auscultation there is high pitched tinkling bowel sounds throughout. There is also a scar visible in the suprapubic region. The hernial orifices are clear.

Immediate management starts off with a conservative approach and a resuscitative effort in the way of the classic 'drip and suck' we all read about in the text books. She is kept nil by mouth and intravenous access achieved. Routine bloods including biochemistry are sent off and crystalloid fluid started to help electrolyte imbalance and to compensate for the dehydration secondary to reduced intake, increased losses and third space loss. A Nasogastric (NG) tube may be inserted to help decompress the bowel particularly if the patient is feeling nauseous or vomiting. The patient is monitored, particularly looking for symptoms and signs of progression, ranging from increased pain to peritonism and sepsis.

Initial diagnostic imaging is an erect chest X-ray as well as an abdominal film. The erect chest X-ray is used to rule out the presence of pneumoperitoneum, and therefore perforation. The abdominal film in this instance shows dilated large bowel up to the left descending colon, with no obvious gas distal to this. There is no evidence of a volvulus.

The next appropriate step while Mrs O is stable is obtaining a contrast CT abdomen and pelvis. This comes back showing an area of obstruction in the descending colon due to what looks like an invading tumour. There is extensive evidence of metastatic spread from the left ovarian tumour which is quite adherent to surrounding structures. There is no evidence of perforation but some ascites is also present.

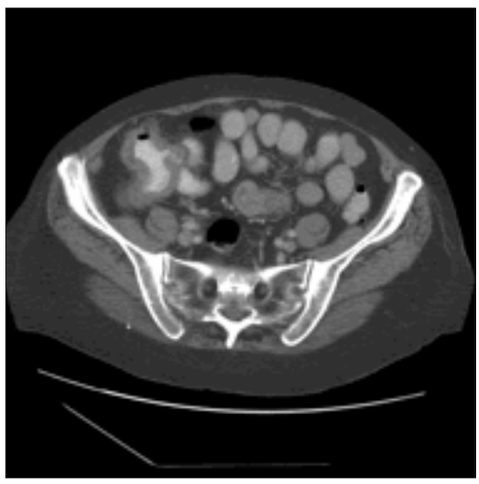
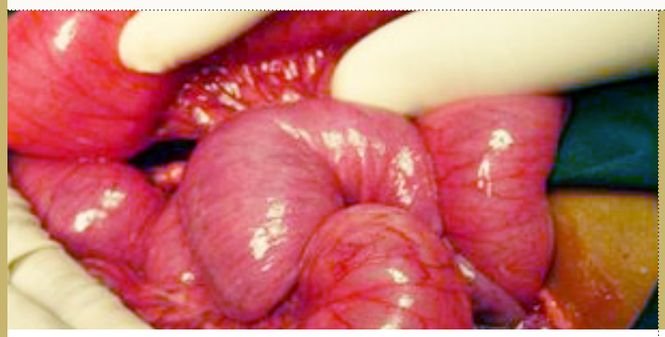


Figure 2: A CT scan showing caecal mass as a cause of obstruction

The real decision now is whether one adopts a conservative or operative approach to this patient's management. Once patients with ovarian cancer establish bowel obstruction, they are looking at a median survival of less than 3 months [6]. There are some suggestions in the literature to help with determining prognosis, such as tumour load, age, ascites, which aid in planning management routes [6].

INTESTINAL OBSTRUCTION

Nomaan Sheikh



Intestinal Obstruction.
General Surgery.

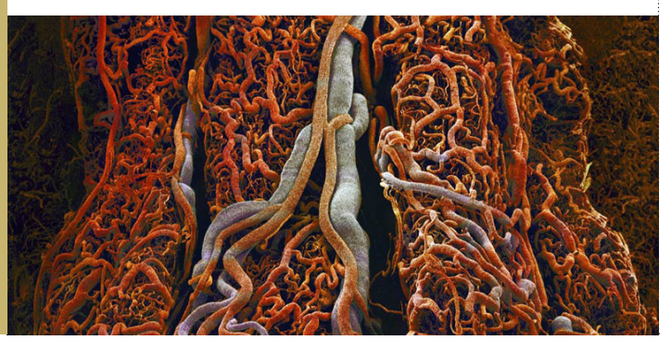
Aggressive surgery with resection is probably not suitable, with her extensive metastasis, poor life expectancy (ovarian cancer stage 3 has a 15%, 5 year survival stage 4 has 5%) along with her other co-morbidities. A more palliative approach should be adopted.

Medical management involves analgesia with the view of helping the abdominal pain. In the palliative care setting the use of corticosteroids is common. They act to suppress nausea and vomiting and their use for refractory obstruction is well documented. It is also thought that the anti inflammatory role of the steroids can help reduce proximal bowel inflammation and swelling, possibly reducing the extent of bowel damage and ischaemia [7]. This is still being investigated.

Octreotide is a somatostatin analogue which has traditionally been used for its antineoplastic ability in the management of carcinoid tumours. It has also been shown to have good effect on symptoms of diarrhoea. Its use in the palliative approach is therefore multiple. In this case, its use will help reduce gastro intestinal secretions and also reduce oedema. If patient suffering from diarrhoea with incomplete obstruction, it can provide great symptomatic benefit [8].

If Mrs O is very symptomatic and there is an obvious point of obstruction, many centres now consider endoscopic self expanding metallic stenting (SEMS) placement for colorectal malignancies. This has been shown to be a very successful option in the short term as well as a 'bridging' therapy in patients who may undergo resection of the tumour at a later, better planned stage [9].

Currently there is not much literature looking at long term benefit and survival after stenting, a recent retrospective review suggests poor longer term outcomes and this procedure should only be considered in patients with poor life expectancy [10].



Case 2

Mr S is a 67 year old male who has had previous laparoscopic cholecystectomy and herniorapphy. He attends casualty as he is concerned. He has not opened his bowels in 7 days and he is now getting abdominal pain, nausea and vomiting.

Again in this case, the immediate assessment and treatment are resuscitative and supportive. The patient is kept nil by mouth and may need a NG tube to decompress the gastro-intestinal tract. IV fluids are initiated and plain radiographs of the chest and abdomen are taken. In this case, small bowel obstruction is suspected. A CT scan of his abdomen shows adhesions as the likely cause of his obstruction.

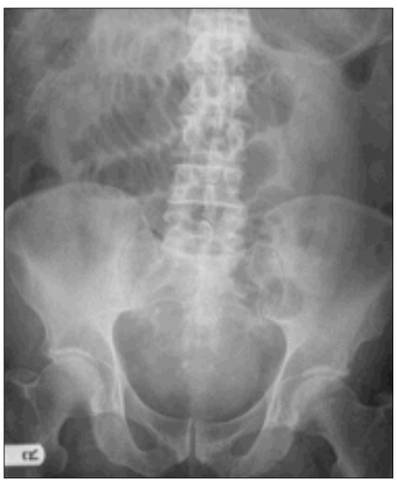


Figure 3: X-ray showing small bowel obstruction

In many patients that we see, initial management is usually conservative [11], with the hope that the condition resolves with some support. This can mean long stays as an inpatient. A more aggressive approach is needed when there is evidence of ischemia, perforation or sepsis. This is usually picked up on by serial examinations and monitoring as well as on CT scan. In this case, a laparotomy with possible bowel resection or adhesiolysis is considered. The problem with doing any further surgery is that it can add to the adhesions, as well as possibly increase your risk of further adhesion related obstructions.

INTESTINAL OBSTRUCTION

Nomaan Sheikh

Recently some studies have advocated the use of laparoscopic adhesiolysis in the emergency setting on patients; this is thought to pose less of a risk of further adhesion formation as compared to laparotomy [12,13,14,] although there are as yet no real long term studies looking at this.

The literature promotes the use of laparoscopic adhesiolysis in the emergency setting with the best outcomes achieved by carefully selecting your patients. Some of the generally acknowledged criteria for successful laparoscopic intervention include a lower ASA grade and patients with two or less abdominal operations in the past [15]. Some centres have reported successful outcomes in the hands of skilled surgeons [16] and very low rates of conversions to laparotomy.

After initial supportive care and careful discussions, Mr S is taken to theatres after 48 hours to undergo laparoscopic adhesiolysis at the hands of an experienced surgeon. Although technically challenging, it is a success and he makes a good recovery and is discharged home.

Case 3

Mr C is a 67 year old male, who is now twelve days down the line from a left hip hemiarthroplasty. The orthopaedic team are concerned as the patient has had reduced oral intake the last few days and has not opened his bowels in 11 days. They have also noticed a gradually distending abdomen.

He is reviewed by the surgeons and is noted to have no symptoms of abdominal colic, and on auscultation no bowel sounds are heard, there is no impacted stool in the rectum. Abdominal X-rays reveal dilated loops of large bowel. He undergoes contrast imaging which reveals no signs of mechanical obstruction. He is diagnosed as having developed a pseudo-obstruction. A careful scrutiny of blood tests reveals a low potassium level of 3.0 and advice is given regarding early correction of electrolyte imbalance and for supportive care. As his electrolyte levels normalise and with some rest his bowel function recovers.

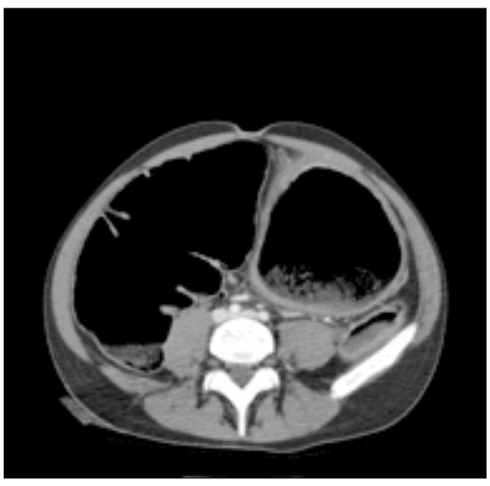
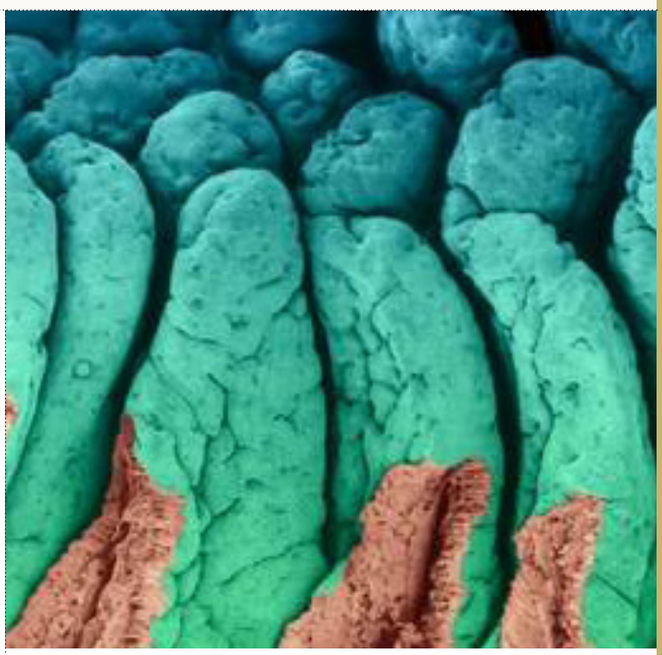


Figure 4: CT scan showing dilated colon in chronic pseudo obstruction



The above situation is a typical story one hears when dealing with pseudo obstruction. There is no obvious mechanical obstruction, peristaltic activity is reduced and the patient is off their diet and post operative recovery is halted. The management priorities include ensuring that there is no mechanical cause of symptoms, correcting any obvious causes of the condition and gently stimulating bowel to encourage normal activity.

Commonly everything settles after a few days resting of the GI tact. Many people have tried pro kinetic medications like metoclopramide and motilin receptor agonists like erythromycin[17] In this day and age of antibiotic related colitis and resistance, erythromycin is falling out of favour.

Some Studies are advocating the use of neostigmine in the refractory patient, with good early success, few side effects and a minimal risk of recurrence [17,18,19]. Neostigmine is an acetyl cholinesterase inhibitor which is thought to jump start the parasympathetic innervation to the gut. Neostigmine is contra-indicated in patients with bradycardia as this may be exaggerated.

Another option is to undergo decompression colonoscopy, with reported 60 – 80% success rates [20]. Surgery is used for complications such as peritonitis from bowel ischaemia or perforation.

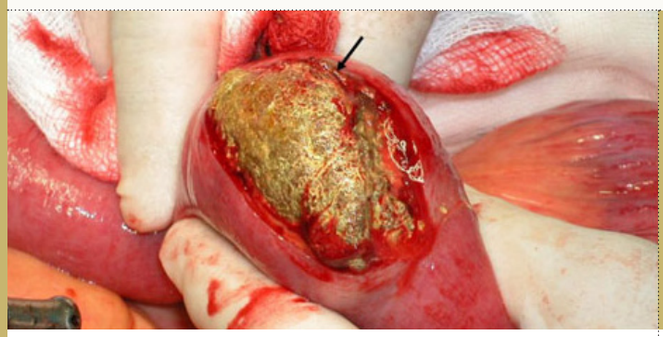
Mr C recovered without the need for any further interventions.

Summary

Intestinal obstruction is a very common surgical condition which can be due to numerous causes. The key to successful management lies in early identification and initiating appropriate treatment. In the above cases, I have tried to highlight some options that are being researched and may be key treatments in the present and the future.

INTESTINAL OBSTRUCTION

Nomaan Sheikh



Intestinal Obstruction.
General Surgery.

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INTESTINAL OBSTRUCTION

Nomaan Sheikh

MCQs

State whether the following statements are True or False.

1. Regarding Intestinal Psuedo-obstruction:

A. Dilated loops of bowel on X-ray with the absence of bowel sounds confirm your diagnosis
B. Acetyl cholinesterase agonists are a treatment option
C. Resolving electrolyte abnormalities can relieve the obstruction
D. Non resolving pseudo-obstruction is treated surgically
E. Can be diagnosed with a barium enema imaging

2. Large Bowel Obstruction:

A. Faeculent vomiting is an early sign of large bowel obstruction
B. Studies show good long term outcomes for metallic stents as a treatment for malignant obstruction
C. Flatus tube or rigid sigmoidoscopy is an effective treatment for caecal volvulus
D. Inflammatory bowel disease can be a cause of large bowel obstruction
E. Initial management always involves treating the cause of obstruction

3. Regarding Intestinal Obstruction:

A. Incarcerated hernia are the most common cause of small bowel obstruction
B. Erythromycin use is based on level 2 evidence in the literature
C. There is no role for neostigmine in treating small bowel obstruction
D. Pseudo obstruction can produce symptoms identical to mechanical obstruction
E. Laparotomy for small bowel obstruction increases the risk of further adhesions as compared to laparoscopic procedures

4. Regarding Intestinal Obstruction:

A. In mechanical obstruction, bowel distal to the site of obstruction collapses following emptying
B. Mucosal barriers are not affected by prolonged obstruction
C. Irrespective of the type of obstruction, initial management is always supportive
D. Colicky abdominal pain is common in pseudo-obstruction
E. Chronic pseudo obstruction can be due to Diabetes Mellitus

Intestinal Obstruction.
General Surgery.

Answers

1. F F T F T

2. F F F T F

3. F F T T T

4. T F T F T

Corresponding Author

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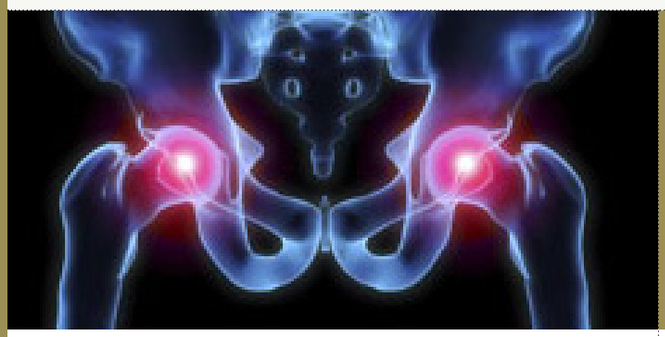
HIP HEMIARTHROPLASTY: A STEP BY STEP GUIDE

Sami Hassan*, Elmunzar Bagouri and Dean S Baiju



Hip Hemiarthroplasty:
A Step by Step Guide.
Trauma & Orthopaedic Surgery.

History and Pathology

Twenty years ago, it was estimated that 1.3 million hip fractures occurred worldwide. This number is predicted to rise to 2.6 million by 2025 and 4.5 million by 2050[1].The majority of these hip fractures occur in the aging population with females being affected more than males [2].

The surgical management of proximal neck of femur fractures requires sound understanding of the relevant anatomy and pathology. This will help in identifying and classifying intracapsular and extracapsular neck of femur fractures and plan the appropriate surgical management.

· Intracapsular fracture is the fracture of the neck of femur occurring inside the capsule of the hip joint.

· Extracapsular fractures are fractures which are distal to the capsular coverings of the hip joint.

The joint capsule attaches at the intertrochanteric line anteriorly and attaches more proximally posteriorly. The femoral head is supplied by the lateral and medial circumflex branches of the profunda femoris artery, a supply from the intramedullary circulation and a minor contribution from the ligamentum teres. Majority of the blood supply is from the medial and lateral circumflex arteries which form an extracapsular arterial ring at the base of the femoral neck. This arterial ring gives of ascending cervical braches that continue proximally along the neck toward the femoral head. Any disruption of this ascending blood supply can result in avascular necrosis of the femoral head. The initial assessment of the patient should include a comprehensive history and thorough examination, ideally utilizing the guidelines set by Advanced Trauma Life Support (ATLSTM). Clear documentation of the above should take place in the patients' notes. The neurovascular status of the affected limb is also essential in both the examination and documentation.

The age of the patient, mechanism of injury, type of injury at the fracture site, combined with a comprehensive medical history of co-morbidities, and social functionality all dictate the overall decision processes with regards to eventual orthopaedic management. Careful emphasis should be placed in identifying a potential medical cause for the trauma as well as highlighting underlying bone disease such as osteoporosis and arthritis. "Fragility" or "insufficiency" fractures can occur due to underlying osteoporosis and therefore National Institute for Clinical Excellence (NICE) have issued opinions for primary and secondary prevention[3].

Along with blood test (full blood count, biochemistry, coagulation screen, calcium and parathyroid hormone levels, and group and save), most trauma units, if indicated stipulate an electrocardiogram and plain chest radiographs as baseline investigations especially in the elderly patient. Drug charts need to be completed in accordance to the WHO analgesia ladder, and local hospital guidelines for anti-thrombosis prophylaxis management, calcium supplementation, and osteoporosis management. More recently ortho-geriatricians are heavily involved in the pre-operative optimisation and post-operative holistic recuperation; which involves management of complications, physiotherapy, social placement, and follow-up.

Classification

Historically the Garden classification [2] has been used to classify intracapsular hip fractures radiologically. The garden classification sub divides the fractures into undisplaced and displaced fractures based on the trabeculae pattern on the AP pelvic view. Primarily this is the medial trabeculae pattern prior to any reduction (Figure 1):

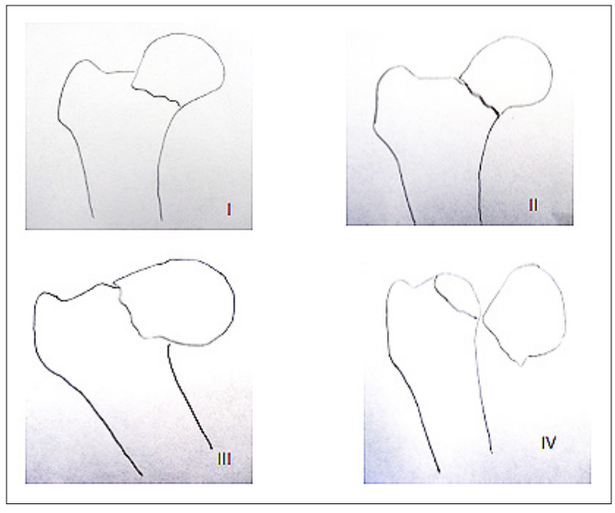


Figure 1: Gardens Classification.

HIP HEMIARTHROPLASTY: A STEP BY STEP GUIDE

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· Undisplaced

1. Incomplete valgus impacted
- Usually an adducted femoral head, and externally rotated shaft.
- Trabecular markings are displaced away from the midline relative to the head, leaving this valgus configuration.
- Stable fractures usually

2. Complete fracture
- Femoral head is usually abducted, but to compensate the femoral neck moves to maintain alignment.

- Displaced

3. Displacement of less than 50 percent
- Femoral shaft is externally rotated, femoral head is usually abducted and rotated axially.

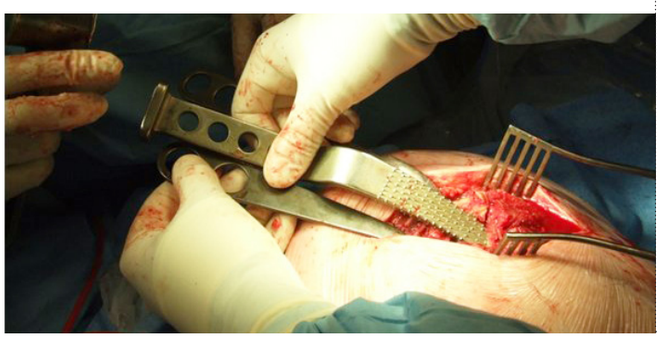
4. Completely displaced
- Head is displaced from the neck and resides anatomically within the acetabulum.

The literature suggests that in the elderly population, Garden I and II carry less risk of non union as compared to displaced fracture neck of femur (5%). With regards to avascular necrosis, the risk for an undisplaced fracture is 11% compared to 40-90% in displaced fractures. Undisplaced fractures are therefore preferred to be managed with internal fixation and displaced fractures with hemiarthroplasty[2].

Alternatively there is the Pauwels classification. This relates to the orientation of the fracture line to the horizontal plane[3]. The greater the angle formed between the horizontal plane and the fracture line, the greater the shearing stress[1] and thus the greater risk of complications such as avascular necrosis. Also the greater the obliquity the greater the chances of delayed or non-union.

1. Pauwels 1 – 0-30 degrees
2. Pauwels 2 - 30-50 degrees
3. Pauwels 3 – 50-70 degrees – has the highest risk of avascular necrosis and non-union.

Other classifications include the AO classification. This is primarily used for research purposes and doesn't have significant everyday clinical use.



Indications

The management of intracapsular fractures is determined by the fracture pattern and displacement which in turn has an influence on the viability of the femoral head. The patient's age and mini-mental test (MMT) score are key factors along with their co-morbidities, current quality of life and functionality. In patients that are less than 60 years old, internal fixation is the preferred option as it attempts to preserve the patient's femoral head. However in older patients with Garden II-IV type fractures, hemiarthroplasty is the preferred surgical option.

Timing of Surgery

Recent studies in management of trauma patients have indicated the potential improvement of outcome from delaying surgery for adequate physiological resuscitation. This is sometimes the case for extracapsular fractures especially subtrochanteric femoral fractures where there is a higher degree of bloods loss anticipated. Conversely delayed surgery leads to a higher incidence of complications for the routine intracapsular fracture neck of femurs. These complications are resultant from pressure sores, unnecessary pain, thrombo-embolic events, and infections of the chest and urinary tract. Therefore early surgery within 48 hours of admission reduces hospital stay and complications occurring and therefore mortality[5]. Literature also indicates that patients with medical co-morbidities that had delayed surgical management for a hip fracture had a 2.5 times greater risk of thirty-day mortality as compared to patients without any co-morbidities6. The overall thirty-day mortality is approximately 9 percent[6].

Obtaining Informed Consent/Explaining the Procedure

Consenting must be according to the GMC guidelines. The process must include discussing all options of treatment, incision site, implants, and steps of the procedure[7]. The benefits of surgery primarily are mobility and pain relief, and that arthroplasty as compared to internal fixation has a lower rate for further surgery[1]. However hemiarthroplasty is a more extensive operation with risks of: infection, injury to the sciatic nerve, wound infection, risk of dislocation, and peri-prosthetic fracture, loosening and prosthesis failure, and even death. The risks of not operating too should be discussed, with patient being informed this option involves lengthy bed rest and complications associated with it. The anaesthetist too must discuss with the patient the type of anaesthetic used, its risks and side effects[7].

HIP HEMIARTHROPLASTY: A STEP BY STEP GUIDE

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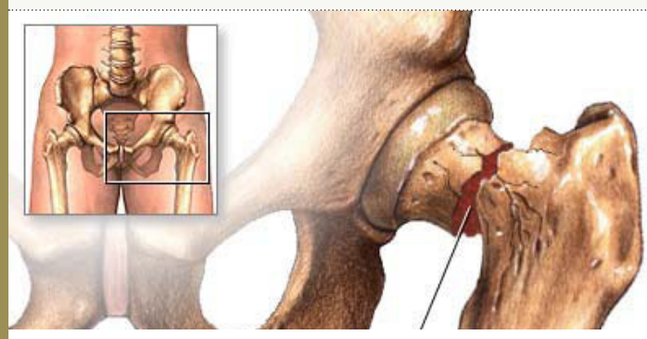

**Hip Hemiarthroplasty:
A Step by Step Guide.
Trauma & Orthopaedic Surgery.**

Equipment and Prosthesis Choice

A sterile operating theatre with laminar airflow and a conventional trauma table is used. The hemiarthroplasty kit of choice is utilized with standardized drapes, antimicrobial prep, as well as diathermy and suction.

The choice of using either a cemented or uncemented the prosthesis must be tailored according to the patient age, mobility and medical condition and co-morbidities. Furthermore they can be sub-divided into unipolar and bipolar[8]. There are different types of prosthesis and some of them are popular and used widely. Implants such as the Austin Moore are still widely used despite their high rates of subsidence and thigh pain anteriorly, however they are preserved for elderly and less mobile patients[8]. Theoretically, bipolar prosthesis are expected to cause less acetabular erosion due to their bipolar design. In addition to that their modular nature allow the surgeons to tailor the length and offset to every patient. Nevertheless, in many of these designs the articulation between the two fails and therefore functions as a unipolar prosthesis, also there are some modular unipolar prothesis available now[8]. The use of cement stabilises the prosthesis especially in people with wider femoral canals; however, pressurization of cement carries risks of fat and debris embolisation[8].

Patient Positioning and Relevant Anaesthetic Points

The patient is positioned in either a supine or lateral decubitus position and/or supported on both sides by immobilising props (Figure 2). Cushions or pads are used to protect the pressure areas intra-operatively. A final WHO Check is conducted in theatre, with the patient's details checked once again against the consent form and the x-ray, re-identifying the procedure consented for by the patient and the side of the operation. Intravenous antibiotics should be administered as soon as possible for greatest efficacy.

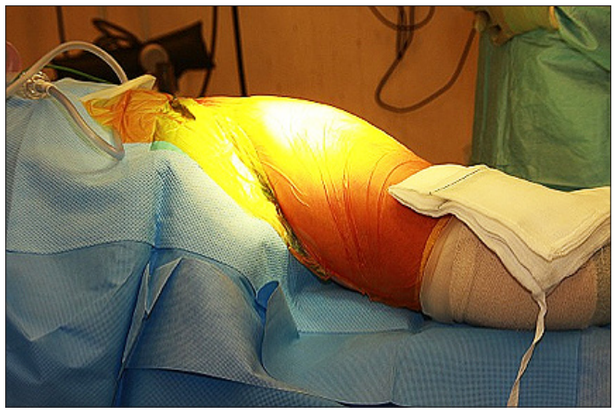

Figure 2: Patient positioned laterally with the appropriate props and surgical drapes.

Sterile Field Preparation and Draping

After excluding allergies, skin preparation such as chlorhexadine must be used to clean the leg. Sterile drapes are used to cover the rest of the patient's body as well as providing a sterile pocket for the leg.

Procedure

For the purpose of this article we will be discussing the Hardinge (the direct lateral) approach to the hip. It should be noted that different implants may require a slightly different approach, cut, and preparation of the proximal femur.

Identifying the operating site starts with palpating the greater trochanter (GT). A sterile marker pen is advised to mark out the incision site (Figure 3). Various literatures discuss the landmarks and incision, however an estimated rule of thumb of a small hands breath proximal and distal to the GT is usually sufficient for adequate exposure. However it should be noted that an excessive incision proximally is likely to lead to injury to the superior gluteal nerve.

HIP HEMIARTHROPLASTY: A STEP BY STEP GUIDE

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Figure 3: Lateral skin incision centered over greater trochanter.

The incision is extended through the subcutaneous fat and fascia lata is divided along the incision line. The bursa tissue is subsequently removed with either diathermy or dissecting scissors. At this point the Charnley retractor can be inserted to maintain field exposure.

Using diathermy, the anterior fibres of gluteus medius and gluteus minimus are split at the tendonous side of the musculo-tendonous junction then distally splitting the proximal fibres of Vastus Lateralis[8]. Anterior T-shaped capsulotomy and gradual external rotation of the leg will help exposing the femoral neck, with the surgical assistant gradually manoeuvring the leg into the sterile leg-bag.

Utmost care must be taken when deciding the level of the neck osteotomy; the length of the remaining neck will determine the height of the prosthesis (and leg length). At least 2 cm should remain proximal to the lesser trochanter[9]. Again as a rule of thumb it is stated that one finger-breadth above the lesser trochanter gives you a good estimate of length. Mark line with broach prior to cut. One should always aim to cut according to the prosthesis being utilised, for example Austin Moore is a medial calcar bearing prosthesis. For this step the oscillating saw is the instrument of choice. Sometimes the calcar may be too short or not intact, hence a non-calcar bearing prosthesis must be considered.

A corkscrew can be used to remove the head from the acetabulum. Retractors to be used as necessary and distal traction of the proximal femur will help removal of the head. The extracted head can be used to size the prosthesis to be used using the various measuring devices (Figure 4).

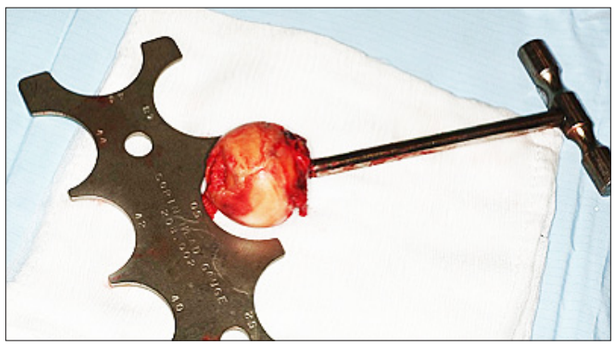
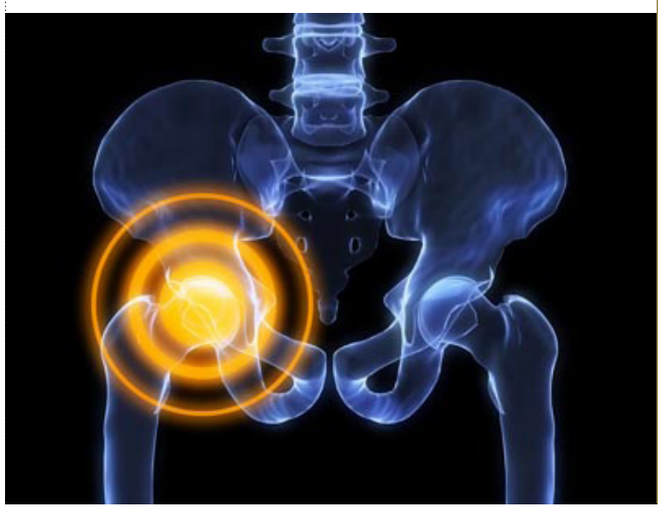


Figure 4: Hip cork and guage for sizing of the femoral head.

The femoral medullary canal is next prepared using the rasp and broaches, commencing at the most postero-lateral edge of the neck of femur. A rasp/broach with the correct head size can be used for trial reduction. At this point the surgeon is not committed and adjustment to the osteotomy, further rasping can take place. Copious lavage is then used to remove debris from the canal prior to inserting the prosthesis.

At this point if a cemented prosthesis is being used a cement restrictor can be placed in the medullary canal. The surgical team should change their gloves, the theatre nurse can then commence mixing the cement, whilst the surgeon can assemble the prosthesis. The anaesthetist is then informed that cementing is about to take place. The cement is inserted via a cement-gun and depending upon the patient condition pressurisation can take place making sure adequate cementing to all zones occurs. It should be noted that cement cures at higher temperatures and the surgeon should be well aware of theatre conditions prior to this step.

The prosthesis is then inserted carefully with care to maintain the correct version and correct alignment (Figure 5). That position is maintained till the cement sets, usually approximately ten minutes from commencement of mixing, but this is depend on room temperature. The hip is then relocated safely into the acetabulum avoiding the risks of a periprosthetic fracture.



HIP HEMIARTHROPLASTY: A STEP BY STEP GUIDE

Sami Hassan*, Elmunzar Bagouri and Dean S Baiju

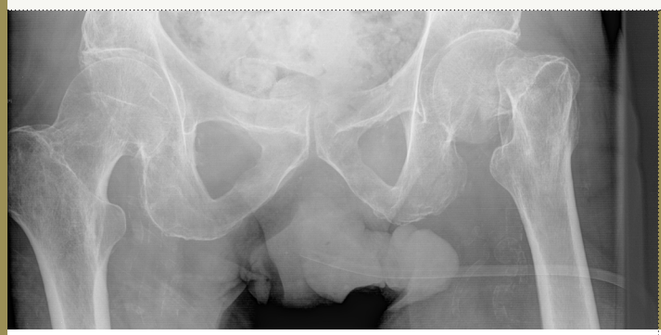


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Figure 5: Prosthesis *Insitu*.

Heavy absorbable sutures must be used to close the capsule and reattach the abductors. Continuous absorbable sutures must be used to close the facia lata (Figure 6) (e.g. Vicryl™ or Loop PDS ™). Absorbable sutures can be used to approximate the fat. Continuous subcuticular absorbable suture (e.g. Vicryl ™ or Vicryl rapide™) or clips to skin[9].

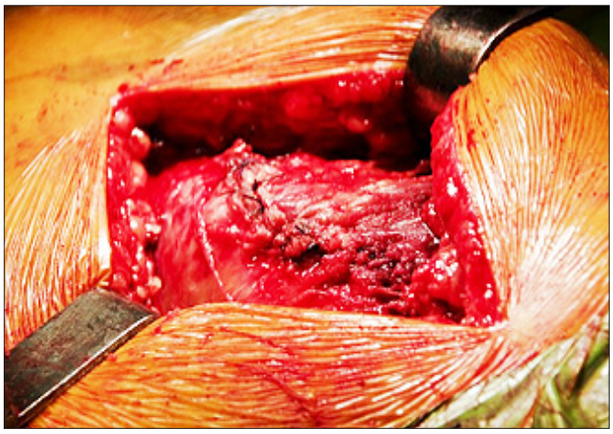


Figure 6: Closure of abductors with interrupted 0 Vicryl sutures.

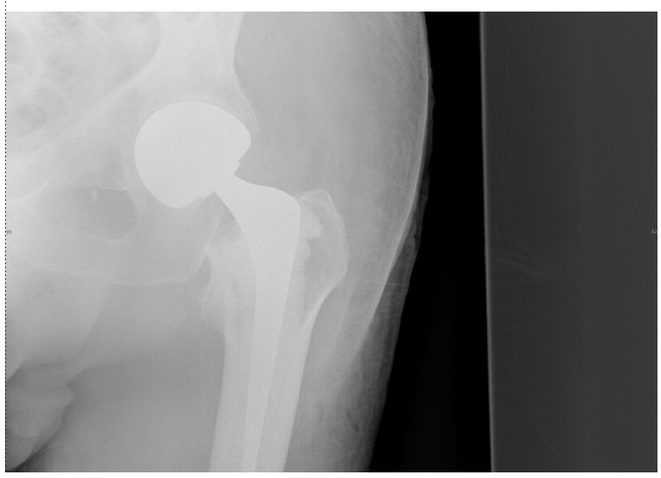
Documentation

· Operation notes must contain a fully legible description of the steps of procedure including the following points:

Date/Time of procedure
Procedure name and Indication
Surgical team (with grades)
Type of anaesthesia
Position of patient
Prep/ draping
Incision and approach
Findings
Steps of procedure and any changes or complications
Type and size of prosthesis
Closure: Types of sutures used and dressings applied to wound.

· Postoperative instructions must include:

Thrombo-prophylaxis (as per hospital/departmental protocol)
Check bloods (FBC and UE)
Check Xray
Antibiotics prophylaxis
Post operative physiotherapy, and weight-bearing status
Instructions for care of the wound.
Outpatient follow-up.



HIP HEMIARTHROPLASTY: A STEP BY STEP GUIDE

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Multiple Choice Questions

1) Which nerve is essential to protect prior to dividing the hip abductors?

a) Inferior gluteal nerve
b) Femoral nerve
c) Superior gluteal nerve
d) Obturator nerve

2) If a pathological fracture is suspected, what is essential for pre-operative planning?

a) Long length femur radiographic views
b) Parathyroid hormone levels
c) MRI scan
d) Bone scan

3) Regarding the blood supply to the hip joint which blood vessel provides the predominant arterial supply?

a) Ligamentum teres vessel
b) Medial circumflex artery
c) Lateral circumflex artery
d) Popliteal artery

4) What does the evidence suggest for a 60 year old fully active man with an intracapsular fracture neck of femur after slipping playing cricket?

a) closed/open reduction internal fixation
b) total hip replacement
c) Bi-polar hemiarthroplasty
d) Non-operative management

5) What is the most appropriate management for a 96-year old frail lady who has a sub-capital fracture neck of femur. She has a past medical history of COPD, type 2 diabetes and an ulcer on her ipsilateral medial malleolus.

a) Total hip replacement
b) Bi-polar cemented hemiarthroplasty
c) Uncemented hemiarthroplasty
d) DHS

Answers

1) C 2) A 3) B 4) A 5) C

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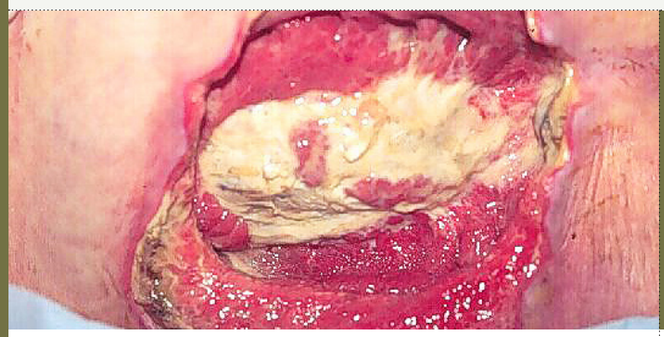


Pressure Sores.
Plastic & Reconstructive Surgery.

Abstract

Pressure sores are common. Immobile and ill patients are particularly at risk of developing them. The mainstay of treatment for pressure sores are preventative measures (so they don't develop in the first place) and interventions which will allow them to heal.

Surgical intervention is unlikely to be successful, unless wound healing is already occurring and as such, can often be avoided. In addition, the same factors that cause pressure sores present a risk of wound breakdown after surgery. This has lead to a definite trend away from surgical management over the last few decades.

Case

A 29 year old with paraplegia sustained 10 years ago after a lumbar spinal cord injury in a motorbike accident had been admitted to hospital. He had been in bed for 1 week with a chest infection. He also has long term problematic spasms in his legs and is doubly incontinent. On admission, he was noted to have a grade 3 right trochanteric pressure sore. It was cleaned and dressed by the tissue viability nurse. A year later, he is requiring alternate day packing by a district nurse. The wound is slowly healing.

Review: Introduction

A pressure ulcer is "localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction" (NPUAP, 1989). Pressure ulcers increase demands on health care resources and are sometimes a source of malpractice litigation. Skin breakdown, often an iatrogenic complication of hospitalisation, increases the length of stay and contributes to morbidity and mortality. Twenty-five percent of pressure ulcers start in the operating room during surgery and 83% develop in the first 5 days of hospitalisation (2). Yet, junior doctors usually have little experience in managing them.

Soft tissue overlying bony prominences is most susceptible to the effects of prolonged pressure. These ulcers tend to have an 'iceberg' quality, with extensive undermining and osteitis of the underlying bone (3).

Immobility is a major contributing factor to developing pressure sores. However, other factors are usually present which predispose to their occurrence, which include a high or low BMI, incontinence, poor skin quality, co-morbidities and malnutrition.

Classification of Pressure sores

Since 1989, the National Pressure Ulcer Advisory Panel's (NPUAP) staging system has been one of the most widely used pressure ulcer classification systems (4). The most recent update of this classification system is in 2007 (Figure 1).

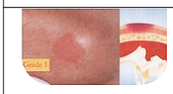
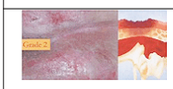
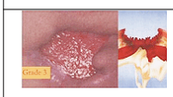
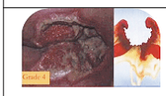
PICTURE	GRADE	DESCRIPTION
	Suspected Deep Tissue Injury	Purple or maroon localized area of discoloured intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.
	**Stage I**	Intact skin with non-blanching redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area.
	**Stage II**	Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.
	**Stage III**	Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling.
	**Stage IV**	Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunnelling.

Fig. 1: Images reproduced courtesy of the European Pressure Ulcer Advisory Panel Classification of Pressure Sores(5, 6)

Anatomical distribution

Bed bound patients are prone to sacral and heel ulcers, lateral positioning will predispose to trochanteric ulcers and patients spending many hours in a wheelchair will be prone to ischial pressure sores. Any other bony prominences can also cause problems, for example the medial epicondyle at the elbow or the zygoma.

Management of pressure sores

The focus of management of pressure sores lies in identifying patients at risk and the implementation of preventative measures. For this, the Waterlow pressure ulcer risk assessment/prevention protocol is, by far, the most frequently used system in the United Kingdom and it is also the most easily understood and used by nurses dealing directly with patients (7).

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Management options of established pressure sores thereafter range from non-surgical approaches to more complex surgical procedures to achieve soft tissue coverage of the affected area.

Non-operative

The non-operative options listed below have been taken from the NICE guidelines on pressure ulcers. Emphasis of treatment is within non-operative interventions. Surgery is not the mainstay of treatment and may be considered if non-operative treatments have been introduced, with evidence of some wound healing.

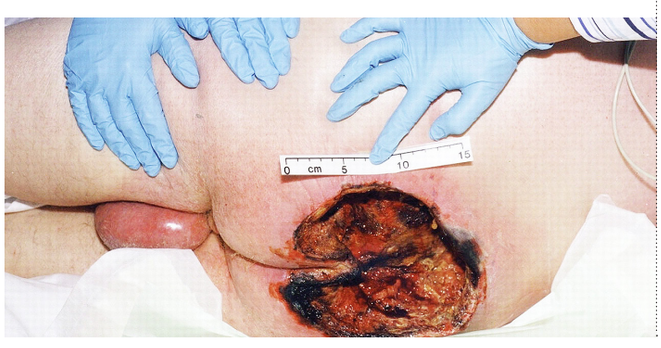
Mobility and positioning

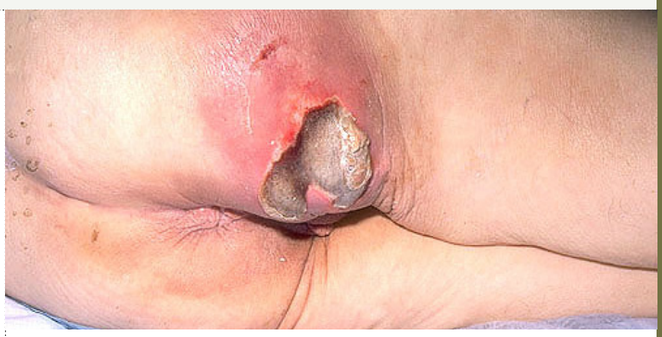
Mobilising, positioning, and repositioning interventions should be considered for all individuals with pressure ulcers (including those in beds, chairs and wheelchairs).

All patients with pressure ulcers should actively mobilise, change their position or be re-positioned frequently. Individuals should not be positioned directly on pressure ulcers or bony prominences (commonly the sites of pressure ulcer development). In patients with compromised mobility, passive movements should be considered.

Since the time of Florence Nightingale two hourly turns have been used, probably because it took 2 hours for nurses to tend to patients from one end of the ward to the other. More recently Dinsdale demonstrated an absence of pressure necrosis in a pig model by relieving pressure for 5 minutes every 2 hours in pressures up to 450mmHg (8). Animal studies show an inverse parabolic relationship between pressure and the duration of pressure application necessary to cause an ulcer: unrelieved axial pressure 4 to 6 times systolic causes necrosis in less than 1 hour; pressure below systolic might not cause similar lesions for as long as 12 hours (9-11). Daniel et al, used a paraplegic pig model to demonstrate muscle necrosis after 2 hours with a pressure of 500mmHg and ten hours with a pressure of 100mmHg (Capillary pressure is up to 30mmHg) (12).

At present, there are still no good human clinical studies which demonstrate this. Recent reviews suggest that the critical interface pressures defined in the animal models above have only a weak qualitative correlation to the development of pressure ulcers in clinical practice (13). This is because development and progression of pressure ulcers is a dynamic process taking into account a combination of factors and not just pressure alone.





Support surfaces for pressure sores

There is no conclusive research evidence that any one pressure-relieving support technology is superior to another. Two main types of systems are used – static and dynamic. Static systems include foam mattresses, cushion supports or overlays, whereas dynamic systems are more sophisticated with air fluidised or air floatation properties.

All individuals assessed as having a grade 1-2 pressure ulcer should be placed on a high-specification foam mattress or cushion with pressure-reducing properties. For individuals requiring bed rails, overlay mattresses should be placed on a reduced-depth foam mattress to maintain safety.

Individuals assessed as having grade 3-4 pressure ulcers (including intact eschar where depth, and therefore grade, cannot be assessed) placed on a replacement or overlay mattress or more sophisticated systems.

Debridement

At the most basic, devitalised tissue should be debrided as they pose an infection risk and prevent healing. Unclassifiable pressure sores should be debrided so that they may become classifiable and receive the appropriate aftercare. Devitalised tissue tends to be anaesthetic so surgical debridement on the ward is usually tolerated well by patients. If it is uncomfortable, local anaesthetic can be infiltrated. General anaesthetic is avoided as most patients have co-morbidities and multiple debridements may be required. Starving times also interfere with nutrition.

Dressings

Choice of dressing or topical agents for the treatment of pressure ulcers should be based as condition of skin and wound, treatment objective, dressing characteristics and patient's preference.

There is no strong evidence to suggest that one dressing in superior to another. However, it is generally recommended that modern dressings such as hydrocolloids, hydrogels, foams, films, alginates and soft silicones are used in preference to basic dressing types (gauze, paraffin gauze and simple dressing pads).

Dressings used should depend on the needs of patients and the goal

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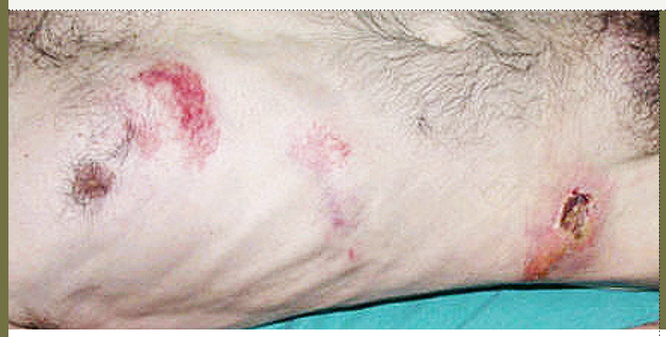

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of treatment and the most important function of dressings is to keep wounds moist (level I evidence)(14). Moist wound healing has been shown to improve re-epithelialization and to decrease infection rates (14). Hydrocolloids, alginates and gels are moisture retentive and can soften up hard eschar and promote healing. Alginates are also commonly used in highly exudative wounds to absorb excess moisture and are replaced with hydrocolloids once the wound show signs of healing with granulation tissue and re-epithelialisation.

Negative pressure therapy should also be considered as it can prove to be an effective treatment to encourage healing and formation of granulation tissue (Figure 4). Gupta et al, published a set of guidelines in 2004, advocating the use of negative pressure therapy in full-thickness skin defects (Stage 3 and Stage 4 pressure ulcers) which is large enough for adequate contact between the foam dressing and the wound bed (15). This can be used until the wound achieves a fully granulated surface (15).

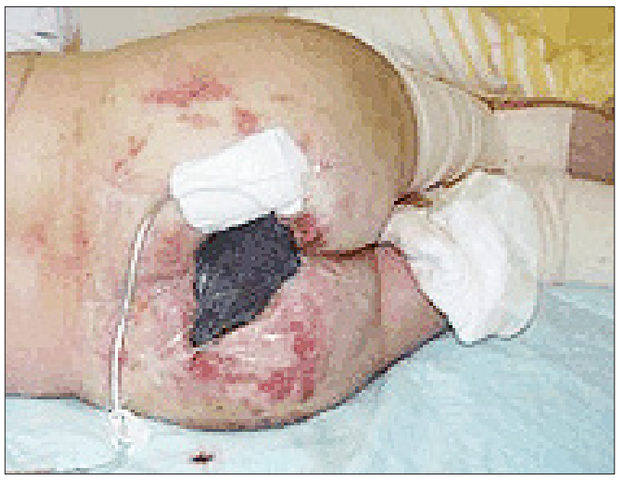

Fig. 2 Application of continuous topical negative pressure using the Negative Pressure Dressing system – pictures reproduced courtesy of the EPUAP (1)

Antimicrobials

If there is clinical evidence of cellulitis (increasing erythema, pain and temperature surrounding the pressure ulcers), patients should be commenced on the appropriate systemic antibiotics. A bacterial count of > 10 5 organisms per gram of tissue sent is diagnostic of infection; infected tissue of this nature is treated by debridement rather than systemic antibiotics.

Nutrition

Nutrition plays and important part in the overall management of pressure ulcer prevention and treatment. There is much evidence to show that malnutrition is a significant risk factor for the development of pressure ulcers (16-18) and a good nutritional status is important in promoting wound healing (18, 19).

A Cochrane review of eight Randomised Controlled Trials (RCTs) in 2003 concluded that although there was insufficient evidence "elderly people suffering from acute illness appear to develop fewer pressure ulcers when given oral nutritional supplement" (20, 21). A separate systematic review in 2005 by Stratton et al. concluded that enteral nutritional support using multi-nutrient feeds, particularly as high protein oral nutritional supplement can significantly reduce the development of pressure ulcers in high-risk patient groups (21). The same review suggests that high protein, disease specific oral nutritional supplement or enteral tube feeding may improve healing although much more robust randomised controlled trials are required to confirm this (21). Since then, there is additional evidence to support the concomitant supplementation of protein-enriched formulas with arginine, zinc and antioxidant vitamins in improving rate of healing of pressure ulcers (22, 23). Again, the evidence for this is not strong.

In essence, nutritional support from a dietician should be given to patients with an identified nutritional deficiency as adequate energy should be delivered to cover requirements and to promote new tissue synthesis. Nastogastric feeding should be considered in those unable to obtain adequate nutrition orally.

Lastly, anaemia of chronic disease or secondary to malnutrition is a common occurrence in this patient group and should be addressed. The causes of anaemia need to be established. Patients with anaemia should be given iron or B12 supplements as appropriate and if their haemoglobin levels are sufficiently low as to cause symptoms, they should be appropriately transfused.

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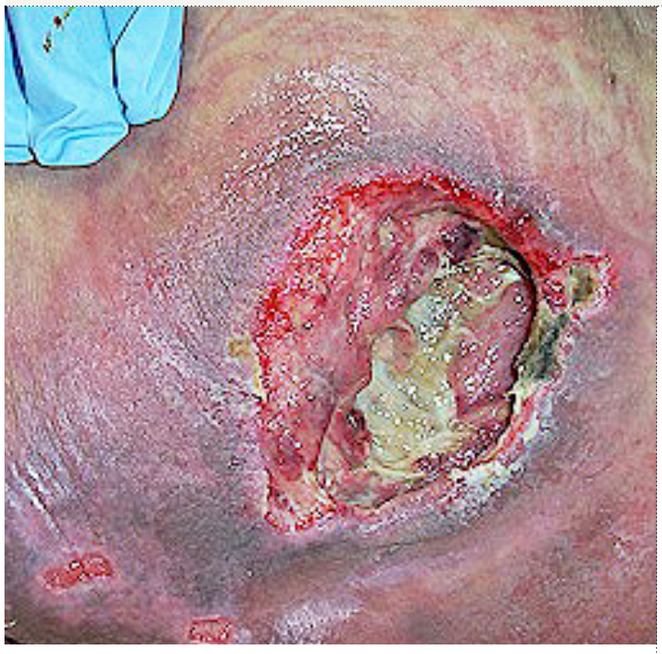

Hygiene

The pressure areas should be kept clean and dry and this may necessitate regular toileting of the area or catheterisation especially in patients who may be incontinent.

Surgery

Surgery is very carefully considered in pressure sores. Other treatments should be used initially. There are many surgical options available to reconstruct defects secondary to pressure ulcers but only in a minority of carefully considered patient cohort these will be successful. Surgical options may also be appropriate in patients who develop complications from deep pressure sores (Grade IV) such as colocutaneous fistulas and osteomyelitis with Grade IV sacral sores, and should there be any doubt, a referral to the appropriate specialties should be considered.

Reconstructive Surgical Procedures

An important element in considering reconstructive surgery is that the patients have to be able to keep pressure off the site of the sore. If this is not possible, any surgical attempts will result in failure, be it to achieve healing in the short term or maintain healing in the long run.

The goals of pressure sore reconstruction are improvement of patient hygiene and appearance, prevention or resolution of osteomyelitis or infection, reduction of fluid and protein loss through the wound, and prevention of future malignancy (Marjolin ulcer) (24). Reconstructive options vary with the anatomic site of the ulcer, previous scars or surgeries, and surgeon preference. These are usually in the form of skin grafts or local flaps.

Direct closure or Grafts

Primary closure should be avoided as tissue loss will mean wound closure under tension. Defects with little or no undermining are unlikely to be suitable for grafting. A split thickness skin graft can be used to cover the defect but has a high failure rate. Nearly all pressure ulcers suitable for surgical intervention, require a local flap with more bulk over the bony prominence and a blood supply.

Flaps

Coverage is achieved with a movable pad of healthy skin and subcutaneous tissue. Type of flaps which can be use will depend on the area requiring coverage (Figure 3 & Figure 4)

Fig. 3.1 Gluteus maximum myocutaneous flap, and its incorporation in a bilateral advancement flap

Fig. 3.2 Defect from a sacral ulcer closed with an advancement flap described in Fig. 5.1 (3)

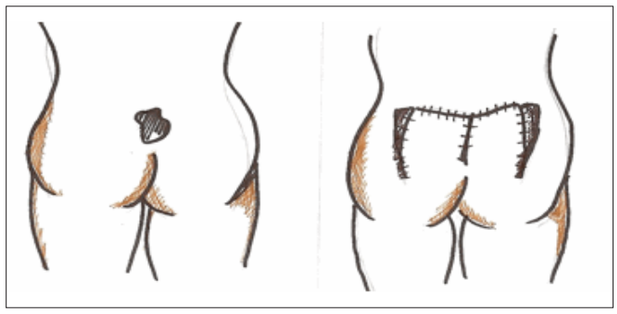

Figure 4: Sacral pressure sore, repaired with bilateral rotation-transposition flaps.

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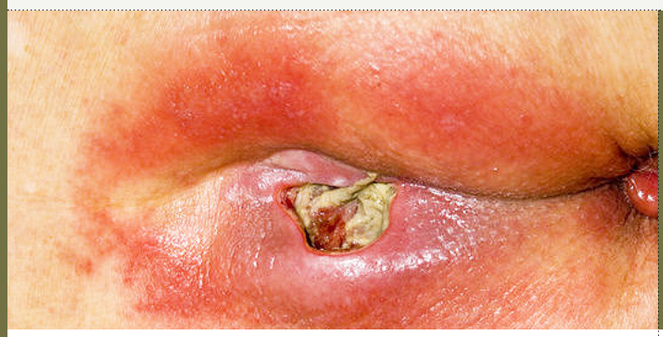

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Difficulties & Pitfalls In Surgical Management Of Pressure Sores

Although there are many surgical options available, it remains a very small part of the overall management of pressure sores. The general condition of patients who develop pressure sores do not make them a suitable surgical candidate for complex surgical procedures. This is especially, so in patients ,who are likely to be permanently bedridden where surgery will most likely be contraindicated.

Another subgroup of patients, where surgical management can prove difficult ,is in paraplegics. The anaesthetic tissues of the paraplegic heal poorly and will fail to heal at the slightest provocation. Thus, surgery is generally avoided.

Discussion

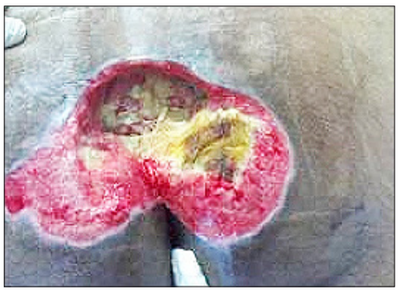
The primary management of pressure sore lies in risk stratification and prevention. A large majority of pressure sores are treated non-operatively because with appropriate conservative measures, further pressure effects can be avoided and wound healing can be improved.

It is an important topic to grasp as well as early intervention will halt the progression of pressure sores. Surgical patients are at risk of developing pressure sores, whatever their primary pathology.

EMQs:

1) A 80 year old woman was admitted from a nursing home with dehydration and confusion. She is normally immobile and is transferred with a hoist. On admission, the below was noted in her sacral region. Picture courtesy from the EPUAP (1). What grade is this?

a. Grade I
b. Grade II
c. Grade III
d. Grade IV



2) 40 year old diabetic with peripheral neuropathy with Grade 3 pressure sores on the heel. How is this best managed? Pick the best answer.

a. Hydrocolloid dressings
b. Debridement & split skin graft
c. Local flap
d. VAC therapy

3) Wheel chairs are particulary associated with pressure sores in which area

a. sacrum
b. ischial tuberosities
c. greater trocanter
d. heel
e. coccyx

4) According to the Waterlow Pressure ulcer prevention/ treatment strategy

a. A sore of more than 20 indicates a very high risk patient
b. The lowest score is 0
c. Any patient undergoing an operation will increase the overall score
d. A catheterised patient will get a higher score
e. Obese patients are not at high risk of pressure sores

5) What is the most appropriate treatment for a grade 2 sacral pressure sore?

a. Debridement and direct closure
b. Split skin graft
c. Topical negative pressure
d. Musculocutaneous: gluteus maximus transposition flap
e. Conservative treatment with regular dressing changes

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Answers

1) d. See classification table – Grade IV Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.

2) a. Anaesthetic tissue heal poorly and pressure sores in the heel are best treated with dressings

3) b. Pressure is most at bony prominences over area of constant pressure – with wheelchairs these are the ischial tuberosities

4) a. Please refer to a Waterlow score card - these are readily available online and on hospital wards.

5) e.

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All authors declare that the answer to the questions on your competing interest form are all no and therefore have nothing to declare.

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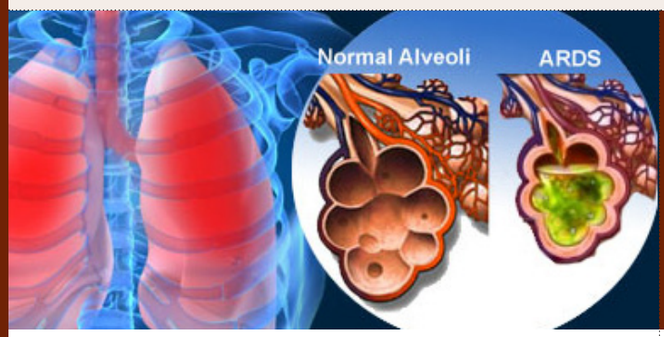
ACUTE RESPIRATORY DISTRESS SYNDROME: A CASE-BASED DISCUSSION AND BRIEF EVIDENCE REVIEW

Suraj Shanmugam, Simon Hickman, Ajmal Eusuf



Acute Respiratory Distress Syndrome: A Case-Based Discussion and Brief Evidence Review.
Cardiothoracic & Critical Care.

Abstract

This article presents the history of a young patient who presented with severe Acute Respiratory Distress Syndrome (ARDS) treated in an intensive care setting. We detail the various treatment methods used as well as responses and associated complications of mechanical ventilation. We also discuss extracorporeal membrane oxygenation as applied to our patient and provide a brief review of the current evidence base as applied to the treatment of ARDS.

Case History

We present the case of a 23-year-old female, 4 months post-partum, who presented acutely to the general surgeons with severe upper abdominal pain, nausea, and vomiting. She had deranged liver function tests, and a significantly raised serum amylase. A diagnosis of gallstone pancreatitis was made following ultra-sound findings of gallstones within a thickened gallbladder and a dilated common bile duct.

24 hours after admission, the patient deteriorated from a respiratory point of view with worsening dyspnoea and a pO_2 of 7.6 kPa on 100% oxygen via a high-flow circuit. This therefore required management with non-invasive Continuous Positive Airway Pressure Ventilation (CPAPV) on a high dependency unit. Despite this she remained hypoxic (see ABG 1) and was then transferred to the intensive care unit. She was intubated on arrival at the unit and a tracheostomy was performed the following day, approximately 16 hours later (Day 1). Her CXR then began demonstrating evidence of acute respiratory distress syndrome (CXR 1). Arterial Blood Gas (ABG) results taken at this stage while being ventilated via tracheostomy showed no improvement in her persistent hypoxia (ABG 2).

Computerised tomography at this point demonstrated pancreatic necrosis, with a large fluid collection in the pancreatic bed, and chest changes consistent with Acute Respiratory Distress Syndrome (ARDS). On discussion with the surgical team, it was felt intervention was not possible at this stage as she required a PEEP of 14 cm H_2O and peak pressures of 40 cm H_2O delivered via pressure controlled ventilation on a FiO_2 of 0.9.The priority was therefore management of her ARDS.

The patient was managed with propofol, midazolam, clonidine and fentanyl for sedation and analgesia, ventilatory support, intravenous antibiotics and naso-jejunal feeding with optimal blood glucose control. This allowed some degree of stabilisation on day 2 as seen on ABG 3.

Attempts to wean her on day 3 by reducing sedation gradually and placing her on pressure support ventilation were unsuccessful due to poor synchronisation of breaths with the ventilator. Further weaning attempts were thus abandoned in favour of full ventilatory support and paralysis with an atracurium infusion (ABG 4).

The admission was then complicated further by a sudden episode desaturation on day 7. Chest x-rays revealed sequential bilateral pneumothoraces (CXR 3-5) for which chest drains were inserted. Proning was commenced at this stage as a recruitment manoeuvre with little improvement in hypoxia as evidenced in ABG 5. The patient also developed acute renal failure requiring continuous haemofiltration for 48 hours. High dose methylprednisolone was commenced at this stage.

Due to refractory hypoxia various management strategies were trialled including inverse ratio ventilation, volume controlled ventilation, and neurally Adjusted Ventilatory Assistance (NAVA). NAVA is a ventilatory technique which attempts to co-ordinate the pressure of delivered breaths with the electrical activity of the diaphragm detected via an oesophageal probe. Further sedation holds were attempted on day 8 but were poorly tolerated (ABG 6).

Eleven days into the intensive care admission, despite optimal conventional therapy, the patient was still hypoxic and in severe respiratory acidosis with a pO_2 of 5.6 kPa on a FiO_2 of 1.0 (ABG 7).

A referral was therefore made to the closest regional centre for Extra Corporeal Membrane Oxygenation (ECMO). She was accepted and transferred within 12 hours. With ECMO, the patient stabilised enough to allow drainage of an intra-abdominal collection secondary to her pancreatitis. She was started on a slow respiratory wean and continues to be managed on the ECMO unit at the time of writing this article (see ABG 2).

ACUTE RESPIRATORY DISTRESS SYNDROME: A CASE-BASED DISCUSSION AND BRIEF EVIDENCE REVIEW

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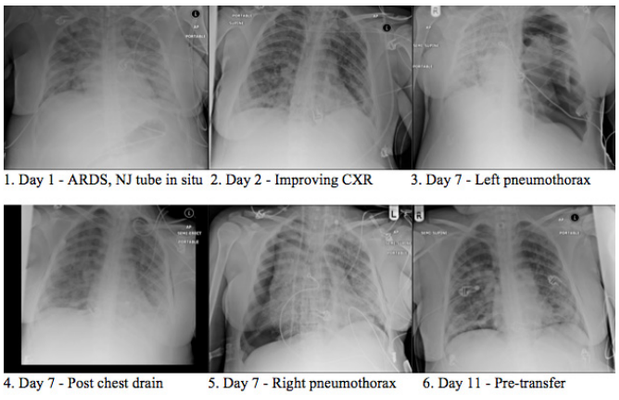
ABG ref	1	2	3	4	5	6	7
Day	0	1	2	3	7	8	11
pH	7.37	7.56	7.40	7.19	7.32	7.30	7.13
pCO_2 (kPa)	5.9	4.0	6.8	10.4	9.2	7.2	10.8
pO_2 (kPa)	7.6	6.3	14.5	12.4	5.1	6.7	5.6
FiO_2	1.0	1.0	0.8	1.0	1.0	1.0	1.0
HCO_3 (mmol/L	24.3	28.8	29.2	24.4	29.6	23.9	20.6
Base excess	-0.2	5.2	5.5	-0.6	7.0	-0.7	-4.2
Lactate (mmol/L)	0.5	0.9	1.7	0.8	7.6	1.5	1.1
Significance/ Action taken	On BiPAP	Tracheostomy and I:E = 1:1	Sedated and stable	Re-paralysed	Proned	Proned again	Transferred for ECMO

Table 1: Summary trend of arterial blood gas results



1. Day 1 - ARDS, NJ tube in situ 2. Day 2 - Improving CXR 3. Day 7 - Left pneumothorax

4. Day 7 - Post chest drain 5. Day 7 - Right pneumothorax 6. Day 11 - Pre-transfer

Figure 1: Summary trend of chest radiographs

Discussion

ARDS is characterised by acute onset respiratory failure, bilateral infiltrates on chest radiographs, the absence of left atrial hypertension and a PaO_2/FiO_2 ratio of <26.7 kPa. Its less severe form is known as Acute Lung Injury (ALI), when the PaO_2/FiO_2 ratio is < 40 kPa. ARDS can develop in response to systemic insult or primary lung disease. These cause the release of inflammatory cytokines, which damage epithelial and endothelial tissues of the lung directly or via neutrophil mediated activity. The result is a diffuse, non-homogenous inflammatory reaction with associated increases in capillary permeability and pulmonary oedema[2].

Common causes of ARDS include pneumonia, aspiration of gastric contents, sepsis as well as severe trauma and associated blood transfusions. However, any systemic insult can precipitate ARDS[2]. The annual incidence of ARDS in the UK is uncertain but is thought to be roughly 4.3 per 100000 with an overall mortality of 38% in an intensive care setting[3]. Multi-organ failure increases mortality significantly.

As evidenced in the aforementioned case, two of the more significant findings in our patient and most ARDS cases are patchy, asymmetrical chest x-ray changes and a refractory hypoxaemia. In the early stages, arterial blood gasses typically show hypoxia with hypo or normocapnia and a respiratory alkalosis. This then evolves into hypercapnia as dead space ventilation increases and fatigue worsens.

Management of ARDS is mainly supportive while addressing the precipitating cause appropriately. Most patients require management in an intensive care setting with respiratory, circulatory and renal support as indicated. Respiratory support is largely directed at improving oxygenation via recruitment manoeuvres in conjunction with lung protection ventilation strategies such as lower tidal volumes and permissive hypercapnoea to try to minimise ventilator induced volutrauma and barotrauma.

The most significant recruitment manoeuvre applied is the use of CPAP or Positive End Expiratory Pressure (PEEP) to maintain partial patency of the small airways at the end of expiration. The application of CPAP via a non-invasive ventilator or PEEP via invasive ventilation will help by increasing functional residual capacity and recruiting as many healthy alveoli as possible thereby minimising shunt and reducing atelectotrauma. There is no consensus about optimum levels of PEEP, but it is of proven benefit[4]. In addition to PEEP, protective ventilation with low tidal volumes and peak pressures are preferred to avoid over distension of healthy areas of lung[5].

ACUTE RESPIRATORY DISTRESS SYNDROME: A CASE-BASED DISCUSSION AND BRIEF EVIDENCE REVIEW

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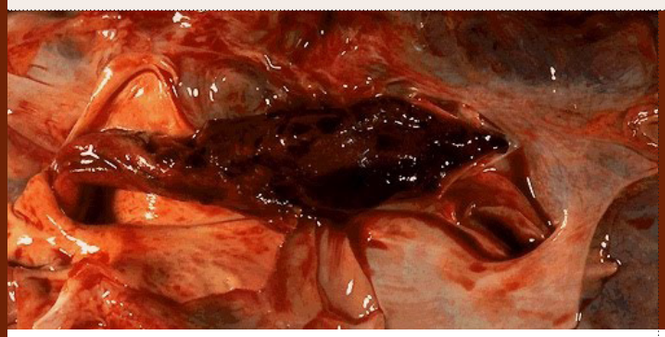

Acute Respiratory Distress Syndrome: A Case-based Discussion and Brief Evidence Review.
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Proning is another recognised manoeuvre to improve oxygenation and is thought to work by recruiting atelectic areas of lung. Patients are turned at fixed intervals to allow further recruitment of areas of lung that are perfused but not ventilated due positional atelectasis. Proning is shown to improve oxygenation but not mortality[6,7]. In addition to recruitment manoeuvres, other substances such as nitric oxide and recombinant human surfactant are used to improve perfusion and ventilation respectively. Nitric oxide is used to encourage vasodilation and perfusion of ventilated areas of lung, thereby reducing ventilation-perfusion mismatching while surfactant reduces alveolar surface tension and improves ventilation. Both treatments have shown benefits to oxygenation but not mortality[8,9]. Steroids have also been advocated to limit the fibroproliferative phase of ARDS but its benefits are less clear and have been shown to be harmful to some groups of patients[10].

Failure to improve with invasive ventilation and the aforementioned strategies necessitates reassessment and evaluation of suitability for further escalation of therapy in the form of ECMO. This technique is providing both cardiac and respiratory support via the use of an extracorporeal circuit containing a 'membrane oxygenator' that mimics gas exchange in the lung thus allowing recovery of the lungs without further mechanical injury. The CESAR trial currently provides the best evidence for ECMO in ARDS showing a 16% improvement in mortality compared to conventional ventilation in similar patient groups[11]. It also suggests possible additional benefits in multi-organ failure. In the study, ECMO is recommended for patients with a Murray score >3 and a pH of <7.20 despite optimal conventional therapy. The Murray score is calculated based on PaO_2/FiO_2 ratios, number of involved chest quadrants, PEEP and lung compliance.

As shown in our case, management of ventilation can prove to be an immense challenge in ARDS and ventilator-associated complications can have a significant impact on progress. In our case, these presented mainly as pneumothoraces, airway trauma and alveolar damage but other complications can include ventilator-asscociated pneumonias and cardiovascular compromise. Early diagnosis and frequent re-evaluation of treatment goals and strategies in keeping with current evidence is the key to safe and effective management. It is also recommended that advice be sought from regional specialist centres with regards to suitability for further specialist treatments like ECMO.

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ACUTE RESPIRATORY DISTRESS SYNDROME: A CASE-BASED DISCUSSION AND BRIEF EVIDENCE REVIEW

Suraj Shanmugam, Simon Hickman, Ajmal Eusuf

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MCQs

1. The following interventions are shown to improve survival rates in ARDS:

a) PEEP/CPAP
b) Proning
c) Nitrous Oxide
d) Human surfactant
e) ECMO

2. In early ARDS:

a) Hypercapnoea is the most common presenting feature
b) Pulmonary capillary wedge pressures are usually normal
c) Steroids are first line therapy
d) Critical care input is not usually required
e) Invasive ventilation should be delayed for as long as possible

3. With regards to Extracorporeal Membrane Oxygenation:

a) It is available on most intensive care units in the UK
b) It is similar in principle to cardiopulmonary bypass
c) Anticoagulation is usually not required
d) It is no better than optimal management with invasive ventilation at improving mortality
e) It does not provide cardiovascular or circulatory support

4. The following are complications of ventilation in ARDS patients:

a) Surgical emphysema
b) Pneumothorax
c) Pulmonary oedema
d) Reduced Venous Return
e) Secondary infections

5. The following are diagnostic features of ARDS:

a) Left ventricular failure
b) Bilateral non-homogenous chest x-ray changes
c) A raised PaO2/FiO2 ratio
d) Pulmonary oedema
e) Hypercapnoea

Answers

1.TFFFT 2.FTFFF 3.FTFFF 4.TTFTT 5.FTFFF

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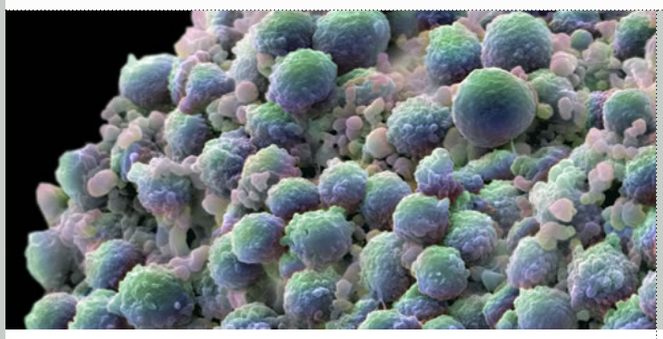
PROSTATE CANCER: AN OVERVIEW OF MANAGEMENT AND NICE GUIDANCE

Thomas R King



Prostate Cancer: An Overview of Management and NICE Guidance. Urology.

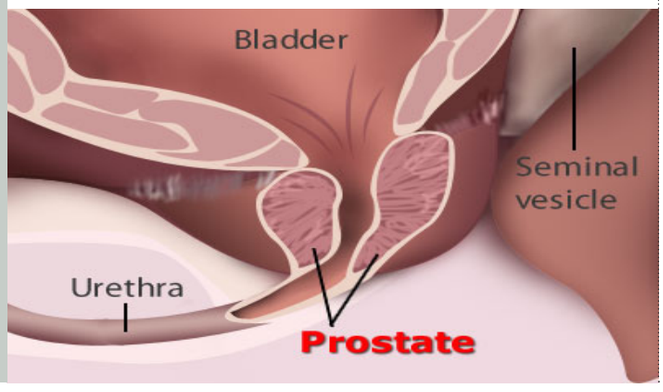
Introduction

Decision making in the management of prostate cancer can seem complex owing to both the nature of the disease and the fact that multiple modalities of treatment are available. The aim of this article is to give an overview of the management of prostate cancer based on the guidance issued by the National Institute for Health and Clinical Excellence (NICE) in 2008.

Prostate cancer is the commonest cancer in men and the second leading cause of cancer death in men after lung cancer. In the UK, prostate cancer accounts for 24% of new cancer diagnoses in men with an annual incidence of around 36000 and 12% of male cancer deaths .

Risk factors for the development of prostate cancer include increasing age, race (increased risk in Afro-Caribbean populations lowest in Chinese), and a positive family history. The majority of prostate cancers are adenocarcinomas occurring in the peripheral zone of the prostate. Local progression is often along the course of nerves (perineural invasion) and may involve the seminal vesicles, bladder neck, trigone, corpora of the penis and the pelvic side walls. Lymph node spread is to pelvic and groin nodes whilst distant metastasis occurs via haematogenous spread, commonly to bone, producing characteristically sclerotic lesions most frequently in the spine and pelvis.

Post mortem data has estimated the prevalence of latent prostate cancer to be around 30% in men in their 50s rising to up to an astonishing 80% in men in their 80s. However despite this very high prevalence of latent disease only 3.8% of men actually die from prostate cancer . This, together with the fact that since the advent of Prostate Specific Antigen (PSA) testing diagnoses are often made early, means there now exists a significant potential for over diagnosis and over treatment of prostate cancer.



Diagnosis and Staging

Clinical presentations of prostate cancer by stage are shown in figure 1, importantly the majority of people are asymptomatic at initial presentation. It is recommended that men suspected of having prostate cancer presenting to primary care should have both a PSA level and Digital Rectal Examination (DRE) performed prior to referral for consideration of a trans rectal ultrasound guided biopsy. The decision concerning whether or not to carry out a biopsy should be arrived at jointly with the patient following a discussion concerning the results of PSA tests and DRE and any previous biopsies, their risk factors and the implications of a finding of cancer. NICE states that elevated PSA alone should not automatically trigger a biopsy .

Localised	Locally Advanced	Advanced
Asymptomatic ?PSA	Asymptomatic ?PSA/DRE	As locally advanced
Incidental DRE	LUTS/ retention	Bone pain/ pathological fracture
Incidental histology from TURP	Haematuria	Neurological symptoms from spinal cord compression
LUTS likely 2º to co-existent BPH	Haematospermia	Incidental
Haematuria Likely 2º to co-existing BPH	Perineal Pain	
	Renal failure	

Figure 1: Possible presentations of prostate cancer by stage.

Biopsy results will confirm the diagnosis and provide a Gleason score which is important prognostically. Regions of cancer within biopsy specimens are given a Gleason grade (1-5) based on the level of glandular differentiation. The two most prevalent Gleason grades are then added together to give a Gleason score (2-10). 2-5 well differentiated, 6-7 moderately well differentiated, 8-10 poorly differentiated. False negative results do occur and a negative result in the face of high clinical suspicion may prompt a repeat biopsy by an alternative technique such as a saturation biopsy.

All prostate biopsy results should be discussed at a multidisciplinary uro-oncology meeting which will consider further management depending on stage (figure 2) and other patient factors (figure 3). Further imaging at initial presentation such as MRI to accurately stage local disease or isotope bone scan to identify metastases, is only necessary where results will alter management. Imaging is therefore not routinely required in men in whom there is no intention for radical treatment.

PROSTATE CANCER: AN OVERVIEW OF MANAGEMENT AND NICE GUIDANCE

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STAGE	SUB-STAGE	DEFINITION
T1		**Clinically unapparent tumour, not detected by digital rectal examination nor visible by imaging**
	T1a	Incidental histological finding; ≤5% of tissue resected during TURP
	T1b	Incidental histological finding; >5% of tissue resected during TURP
	T1c	Tumour identified by needle biopsy
T2		**Confined within the prostate**
	T2a	Tumour involves half of the lobe or less
	T2b	Tumour involves more than one half of one lobe but not both lobes
	T2c	Tumour involves both lobes
T3		**Tumour extends through the prostate capsule but has not spread to other organs**
	T3a	Extracapsular extension (unilateral or bilateral)
	T3b	Tumour invades seminal vesicle(s)
T4		**Tumour is fixed or invades adjacent structures other than seminal vesicles**
	T4a	Tumour invades bladder neck and/or external sphincter and/or rectum
	T4b	Tumour invades levator muscles and/or is fixed to pelvic wall

Figure 2 - T Staging of Prostate Cancer.

-Age and life expectancy without prostate cancer

-TNM stage

-Gleason Score

-PSA / PSA kinetics

-Co-morbidities

-Level of activity

-Symptoms- urinary, bowel, bone pain

-Sexual function

-Psychological impact

-Suitability for clinical trial

Figure 3 – Points to consider/discuss when deciding on treatment.

Treatment

Important points for consideration and discussion with the patient when deciding which treatment option to pursue are shown in figure 3, different strategies are used for localised, locally advanced, and advanced disease respectively and are discussed below. Partin's table are nomograms which can help in the decision making process by predicting the chances of extraprostatic extension of tumour and lymph node status, (pathological T and N stages) from the clinical stage, PSA level, and Gleason score.

Localised Prostate Cancer (T1-T2, N0, M0)

Cure is possible at this stage but the side effects of radical treatment are significant (see later) and owing to the often slow progression of the disease over treatment is a possibility. Men with localised disease are stratified into low, intermediate and high risk groups based on their risk of disease recurrence following radical treatment.

It is important to note that other than radical prostatectomy vs watchful waiting[6], no one treatment has yet been shown to be superior in the setting of a randomised controlled trial.

Low Risk	PSA < 10ng/ml **AND** Gleason score ≤6 **AND** Clinically T1-T2a
Intermediate	PSA 10-20ng/ml **OR** Gleason 7 **OR** T2b-T2c
High Risk	PSA>20ng/ml **OR** Gleason ≥8 **OR** T3+

Figure 4 - Risk stratification of localised prostate cancer.

Locally Advanced Disease (T3-T4/ N+, M0)

Men with locally advanced disease are at significant risk of disease progression and death from prostate cancer. In this setting both local control and prevention of distant metastases is required usually through a combination of local radiotherapy and systemic hormone therapy. Additional palliative procedures may also be necessary such as TURP or upper tract decompression depending on symptoms.

Metastatic Disease (M+)

The mainstay of treatment for metastatic prostate cancer is hormone therapy and palliative procedures for local and metastatic complications. Mean life expectancy is in the region of 18 months.

There now follows an overview of the various treatment options available:

Active surveillance is an approach used in localised prostate cancer whereby radical treatment to cure the patient is intended but deferred until there is evidence of disease progression such as an increasing PSA or progression on repeat biopsy. The rationale for this comes from studies which have show that up to 50% of prostate cancers diagnosed via PSA testing would never have presented in the absence of the test. The aim therefore of active surveillance is to avoid over treatment by targeting radical therapy to cancers with early signs of progression and thereby reduce the burden of treatment associated morbidity without affecting survival. NICE recommends that all men with low risk localised prostate cancer who are suitable for radical treatment are first offered active surveillance. Active surveillance should be discussed as an option in intermediate risk cases and is not recommended for men with high risk prostate cancer.

Surveillance protocols vary but include regular PSA tests and DRE initially 3 monthly, subsequently 6 monthly and NICE recommends at least one repeat biopsy. Complications of active surveillance include the psychological uncertainty associated with deferred treatment and of course the chance of disease progression beyond a potentially curable stage.

PROSTATE CANCER: AN OVERVIEW OF MANAGEMENT AND NICE GUIDANCE

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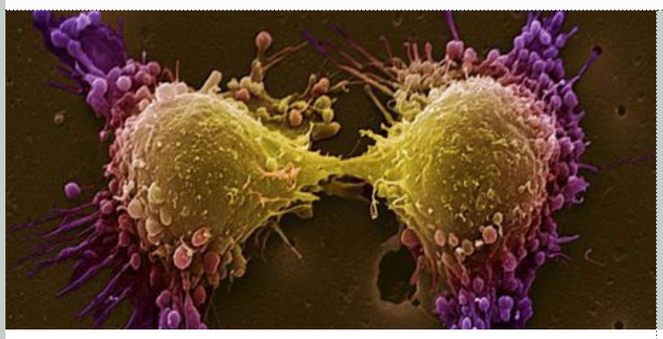

Prostate Cancer: An Overview of Management and NICE Guidance. Urology.

Radical prostatectomy is the surgical removal of the entire prostate gland together with the seminal vesicles and subsequent reconstruction of the bladder neck and anastamosis with the urethra. It can be performed via either open (retropubic or perineal), laparoscopic or robotically assisted techniques and is the preferred treatment option for intermediate risk localised prostate cancer and for those with high risk localised disease where there is a realistic prospect of cure. Radical prostatectomy is usually only offered to patients with a life expectancy greater than 10 years and who are fit for surgery.

In 2005 a randomised controlled trial comparing radical prostatectomy with watchful waiting demonstrated a 5% improvement in overall 10 year survival in those undergoing surgery, 72% vs 68% and a reduction in 10 year prostate cancer specific mortality from 14.9% to 9.6%. The occurrence of distant metastases by 10 years was also reduced in those undergoing surgery by 10%. Complications following radical prostatectomy are not uncommon and include sexual dysfunction (51-61%), stress incontinence (4-21%), and a peri operative mortality of 0.2-1.2%. Urethral stricture can also develop in up to 8%. These risks should obviously be discussed fully with patients prior to any decision and patients should have prompt access to specialist continence and erectile dysfunction services together with an offer of preoperative sperm storage.

Clinical or radiological evidence of T3 disease is often seen as a contraindication to radical prostatectomy as cure is unlikely to be achieved, however radical surgery is sometimes performed for T3 disease and NICE has called for further trials to investigate the role of radical prostatectomy and extended lymphadenectomy in locally advanced disease.

External Beam Radiotherapy (EBRT)

In the UK EBRT is the most frequently performed treatment for localised prostate cancer[4]. Three dimensional conformal delivery techniques have enabled higher doses of radiation to be administered more accurately to the prostate thereby reducing adverse effects on surrounding tissues. EBRT is recommended for localised and locally advanced prostate cancer and is often given with adjuvant, neoadjuvant or concurrent hormonal therapy. In localised prostate cancer, 10 year disease free survival rates of 100%, 69% and 57% for T1a, T1b and T2 disease respectively have been reported. The combination of EBRT and hormones in locally advanced disease has also been shown to improve both overall and disease specific survival at 5 years. Side effects include erectile dysfunction, cystitis and proctitis for which 5 yearly flexible sigmoidoscopies are recommended.

Brachytherapy involves the administration of radiation directly to the prostate either through permanently implanted 125 seeds (low dose rate) or via temporarily placed wires (high dose rate). Implants are placed using ultrasound guidance via a transperineal route under either a general or spinal anaesthetic. Low dose rate brachytherapy can be used as a primary treatment for low and intermediate risk localised prostate cancer. Although there are no randomised controlled trials comparing the use of brachytherapy to that of either EBRT or radical prostatectomy outcomes appear to be broadly equivalent in other studies. NICE does not however recommend bracytherapy in high risk localised disease. In addition to its use as a primary treatment brachytherapy, in particular high dose rate, is used as a boost for ERBT in locally advanced disease.

Complications of brachytherapy include irritative urinary symptoms in 46-54%, acute urinary retention in 1-14%, acute proctitis in 1-2%, incontinence in 5-6%, urethral strictures 1-2% and erectile dysfunction in 4-14%[11]. Owing to the potential for worsening urinary symptoms those with significant LUTS or large prostates >50ml should not undergo brachytherapy. Other contraindications include previous AP resection, previous high dose pelvic radiotherapy and recent TURP.

Cryotherapy and High Intensity Focused Ultrasound (HIFU)

Cryotherapy and HIFU are both novel therapies with potential benefit in localised and locally advanced prostate cancer. Cryotherapy involves the delivery of liquid argon or nitrogen via transperineal cryoprobes placed under ultrasound guidance to freeze prostatic tissue triggering cellular necrosis whilst the urethra, external sphincter and rectum are protected by warming devices.

HIFU uses ultrasound energy transmitted from a transrectal probe to cause prostatic tissue destruction by localised heating without effecting intervening structures. Both procedures require either spinal or general anaesthetic and have similar complications including erectile dysfunction, incontinence, lower urinary tract symptoms and rarely recto-urethral fistula. Currently NICE does not recommend either cryotherapy or HIFU as a primary treatment for prostate cancer except in the setting of clinical trials.

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Watchful Waiting

In contrast to active surveillance, with watchful waiting there is no intention for radical treatment and evidence of disease progression usually prompts only palliative intervention in the form of hormone therapy. This approach is mostly suited to older patients usually over 75 or those with significant co-morbidities.

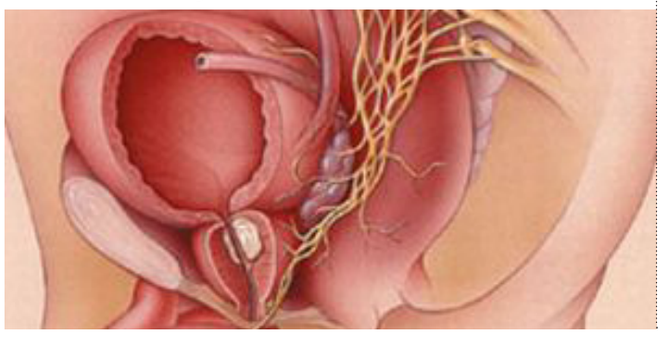
Hormone Therapy

Normal prostatic epithelial cells are dependent on circulating androgens for continued growth and undergo arrest of growth and apoptosis in their absence. Most prostate cancers also initially exhibit this property which hormone therapy aims to exploit for palliation of symptoms and to slow progression in locally advanced and metastatic disease. Recommended first line treatment for metastatic disease is with androgen withdrawal. This can be achieved either by bilateral orchidectomy or medically through the use of Leutenising Hormone Releasing Hormone Analogues (LHRHA) such as goserelin which inhibit the release of Leutenising Hormone (LH) and therefore inhibit leydig cell production of testosterone. LHRH analogues initially increase LH production and so can produce an initial tumour flare which in the case of vertebral metastases can precipitate spinal cord compression. An anti androgen such as bicalutamide or cyproterone acetate is therefore prescribed before and during the first few weeks of LHRHA therapy. New pure LHRH antagonists (degorelex) do not produce tumour flare.

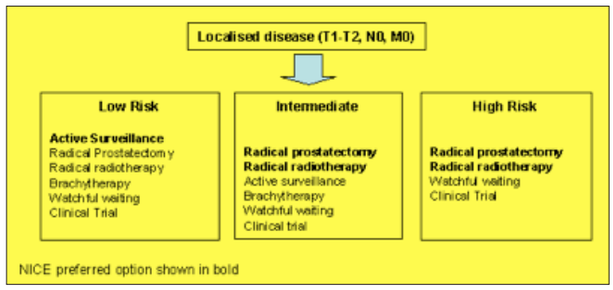
The addition of a long term anti-androgen to androgen withdrawal is known as combined androgen blockade and has the theoretic benefit of blocking the action of adrenal derived androgens as well as testicular. NICE does not recommend combined androgen blockade as first line treatment, however, it is often used second line.

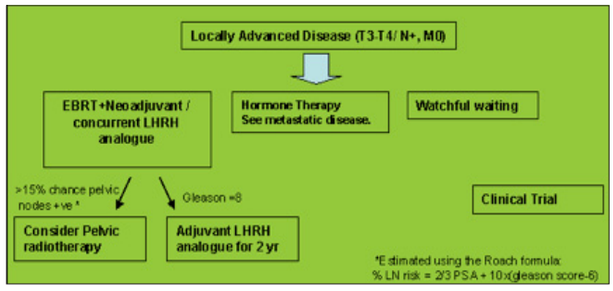
A rising PSA or clinical progression despite hormone treatment is evidence of hormone refractory disease and should prompt a discussion at MDT. Further treatment options include corticosteroids, diethylstilboestrol, or in those fit enough, chemotherapy.

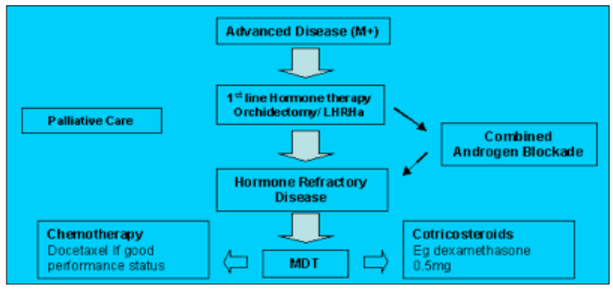
Side effects of hormone therapy include loss of libido and erectile dysfunction, gynecomastia, hot flushes and osteoporosis. In an attempt to mitigate these NICE states that intermittent androgen withdrawal may be offered to men provided they are counselled that there is no good evidence available concerning its effect on survival. In addition, men who hope to maintain sexual function and are willing to except the adverse impact on survival may be offered anti androgen monotherapy with bicalutamide.



Treatment Algorithms Based on NICE Guidance







Management in prostate cancer can seem complex but is simplified by thinking in terms of localised, locally advanced, and advanced disease. Decision making regarding localised disease is probably the most challenging owing to the potential for over treatment, the morbidity associated with treatment and the fact that no one treatment is known to be superior.

Further research is ongoing in terms of randomised controlled trials comparing established treatments both with each other and with novel therapies, and also in new ways to identify those prostate cancers with the potential to progress.

Further Reading

Prostate Cancer: Diagnosis and Treatment, Full Guidance. NICE. 2008.
MDT Guidance for Prostate Cancer. British Uro-Oncology Group, British Prostate Group, British Association of Urological Surgeons. 2009.

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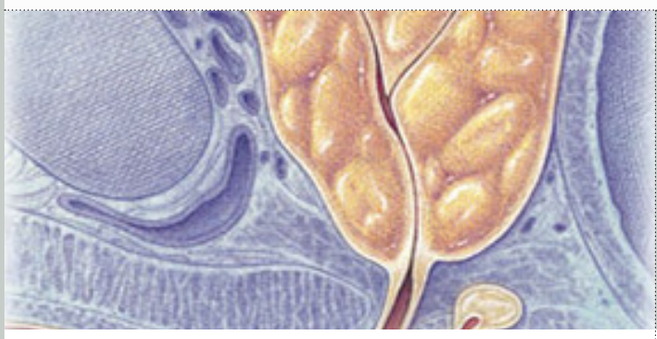

Prostate Cancer: An Overview of Management and NICE Guidance. Urology.

EMQs

1) Concerning Staging. From the list below select the most appropriate answer for each of the following scenarios.

a) T0
b) Tx
c) T1a
d) T1b
e) T1c
f) T2a
g) T2b
h) T3a
i) T3b
j) T4

1) 65 year old man with a benign feeling gland who undergoes TURP, the histology of which shows adenocarcinoma in 10% of specimens.

Answer: d.
T1b disease. Incidental finding of cancer >5% of TURP specimens.

2) 60 year old man with an elevated PSA and palpable nodule in the prostate who undergoes MRI scan showing tumour extending to the seminal vesicles.

Answer: i. T3b.
Tumour extending to seminal vesicles. Although it may not have been apparent clinically imaging has shown this man has locally advanced disease.

3) 59 year old man with a PSA of 15 and a benign feeling gland who undergoes needle core biopsy.

Answer: e. T1c.
Impalpable tumours identified on needle core biopsy are T1c.

4) 70 year old man with a nodular prostate which feels fixed.

Answer: j. T4.

2) Concerning management. From the list below select the most appropriate treatment option for each of the following scenarios.

a) Wathcful waiting
b) Active surveillance
c) Radical prostatectomy
d) High intensity focused ultrasound
e) LHRH analogue
f) Brachytherapy.

1) 59 year old man who is fit and well and has a normal DRE has undergone TRUS biopsy for a PSA of 15, the results of which show adenocarcinoma Gleason score 7.

Answer: c.
Radical prostatectomy. Based on the above information this man has intermediate risk localised prostate cancer the preferred treatment for which according to NICE is either surgery or radical radiotherapy. An MRI scan to confirm the T stage and a bone scan to rule out any metastases will be required.

2) 60 year old man, fit and well with a PSA of 7 and a benign feeling prostate, biopsy of which showed Gleason score 6.

Answer: b.
Active surveillance. This man has low risk localised disease the preferred treatment option according to NICE is active surveillance. This part of the guidance has been controversial owing to the risk of disease progression beyond a potentially curable stage during surveillance. In practice this man would be offered all treatment options and may choose to undergo radical treatment initially.

80 year old man with COPD and a limited exercise tolerance who has a PSA of 12 and a small palpable nodule in the left lobe of the prostate, biopsy of which shows Gleason score 7.

Answer: a. watchful waiting.
This man's age and co-morbidities mean that his intermediate risk localised prostate cancer is unlikely to effect his life expectancy.

PROSTATE CANCER: AN OVERVIEW OF MANAGEMENT AND NICE GUIDANCE

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3) 73 year old gentleman with a PSA of 150ng/ml and sclerotic lesions in the pelvis on bone scan.

Answer e. LHRH analogues.
This man has metastatic disease and should have androgen withdrawal hormone therapy. An alternative to LHRH analogues is bilateral orchidectomy.

3) Concerning treatment. Select the most appropriate treatment option from the following:

a) watchful waiting
b) External beam radiotherapy
c) Brachytherapy
d) Active surveillance
e) Radical prostatectomy
f) Goserelin
g) Degorelex

1) Is contraindicated in those with small volume prostates.

Answer: c. Brachytherapy.
In those with small prostates (<50ml) placement of the radioactive seeds may be difficult.

2) Following treatment men should have regular flexible sigmoidoscopy.

Answer b.
External beam radiotherapy. Radical radiotherapy increases the risk of rectal cancer and makes screening by faecal occult blood testing unreliable due other radiation induced changes. NICE therefore recommends men who have been treated with radical radiotherapy undergo flexible sigmoidoscopy every 5 years.

3) Is a leutenising hormone releasing hormone antagonist.

Answer: g. Degorelex.
Degorelex is a relatively new drug which antagonises LHRH and does not produce a tumour flare.

4) Can precipitate spinal cord compression.

Answer: f. Goserelin.
As an LHRH analogue goserelin can cause an initial increase in production of leutenising hormone which in turn causes an androgen induced tumour flare which can precipitate spinal cord compression in the setting of vertebral metastases.

4) Concerning PSA levels. Select the most appropriate answer from the following options:

a) less than 1.0ng/ml
b) less than 0.1ng/ml
c) less than 2.7ng/ml
d) less than 7.2ng/ml
e) less than 10.5ng/ml
f) less than 5.0ng/ml

1) The normal PSA level for a 44 year old man.

Answer: c.
Less than 2.7 ng/ml. PSA levels increase normally with age and as such age specific reference ranges are used to improve the sensitivity and specificity of the test in detecting cancer. The British Association of Urological surgeons quotes the following normal reference ranges: age 40-49 PSA less that 2.7; age 50-59 PSA less than 3.9; age 60-69 PSA less than 5.0; age 70-75 PSA less than 7.2 although others are used.

2) The PSA level expected following radical prostatectomy.

Answer: b.
Less than 0.1ng/ml. Following radical prostatectomy PSA should fall to extremely low levels. A level greater than 0.4ng/ml and rising in this setting is suggestive of residual disease.

3) The normal PSA level for a 71 year old man.

Answer: d.
Less than 7.2ng/ml.

4) The normal PSA level for 65 year old man.

Answer: f.
Less than 5.0ng/ml.

5) Concerning metastatic disease. Select the most appropriate answer from the following options.

a) Combined androgen blockade
b) Docetaxel
c) Androgen withdrawal.
d) Palliative external beam radiotherapy
e) Bicalutamide

1) 1st line hormone therapy for metastatic prostate cancer.

Answer: c.
Androgen withdrawal. Either via LHRH analogues or bilateral orchidectomy.

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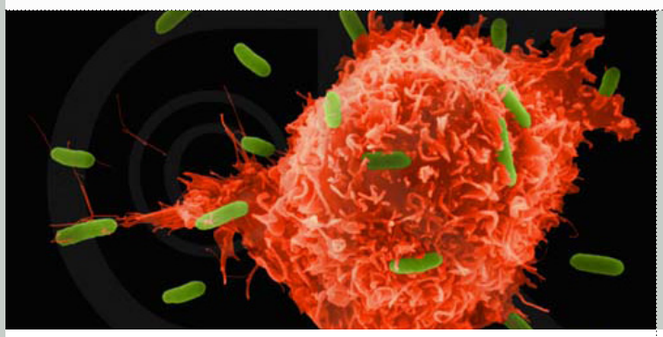

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2) 75 year old man with vertebral metastases and symptoms of spinal cord compression.

Answer: d.
Palliative external beam radiotherapy. Palliative radiotherapy can be used to improve pain from bone metastases and in the setting of spinal cord compression from vertebral metastases.

3) 72 year old man with good performance status with metastatic prostate cancer whose PSA is rising despite both androgen withdrawal an anti-androgen therapy.

Answer: b.
Docetaxel chemotherapy. Third line therapy for hormone refractory prostate cancer includes chemotherapy in those who are fit and corticosteroids (dexamethasone) in those who are not.

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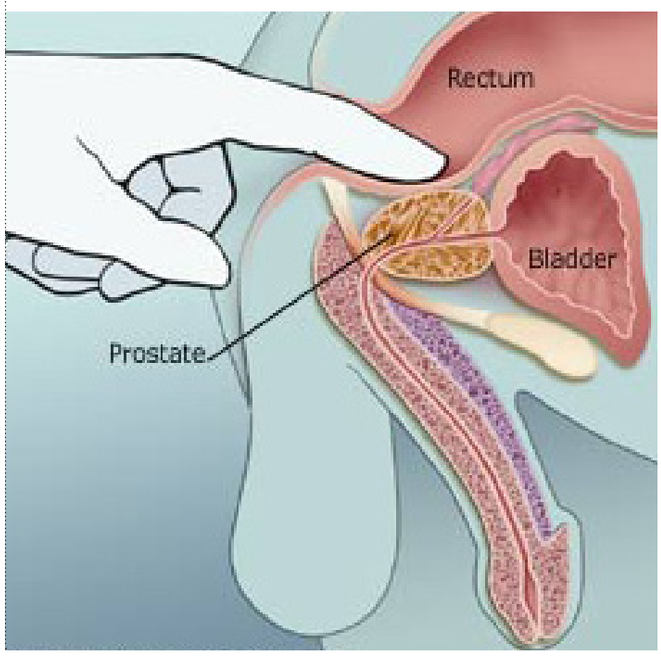

HOARSE VOICE

Ameet Gupta

Hoarse Voice.
Otorhinolaryngology & Neck Surgery.

An Introduction to Management of Hoarse Voice

Hoarseness is a common presentation with a significant number of patents being referred to ENT and voice clinics. It is estimated that over fifty thousand patients are seen in clinic with hoarseness throughout the UK[i]. As a surgical trainee, it is important to have a list of differentials and initial investigations to assess these patients. It is also imperative that knowledge of underlying sinister pathologies, such as malignancy, is known in order to deliver safe patient care. This article aims to give an overview this subject.

Normal Voice Production

Voice is produced by air moving through the vocal cords (phonation). Alteration in the length and tension of these cords is reflected by a change in pitch; whilst volume is determined by the force by which air is moved through the cords.

Control of the vocal cords is via the intrinsic laryngeal muscles. The names of these muscles, together with function and innervations(s) are shown below (Table 1). The vagus (CN X) gives rise to the recurrent laryngeal and superior laryngeal nerves. The external laryngeal nerve is a branch of the latter

Muscle	Function	Innervation
Cricothyroid	Stretch/tense vocal cord	External laryngeal nerve
Posterior cricoarytenoid	Abduct/externally rotate the arytenoid cartilages, resulting in abducted vocal cords	
Lateral cricoarytenoid	Adducts/internally rotate arytenoid cartilage resulting in vocal cord adduction	
Thyroarytenoid	Relaxes vocal fold	
Vocalis	Relaxes posterior vocal ligament	
Transverse arytenoids	adducts vocal cords by adducting the arytenoid cartilage	
Oblique arytenoids	Reduces the distance between the arytenoid cartilage and epiglottis thus narrowing the laryngeal inlet	

Table 1 – Intrinsic muscles of the larynx[ii]

What is a Hoarse Voice

The term hoarse voice is used by patients and health professionals to describe a disturbance in voice production. Hoarseness comes under the umbrella term of dysphonia which is used to describe a range of different changes. These include hoarseness, weak, excessively breathy, harsh, or rough voice. A hoarse voice can be viewed as leakage of air thought the vocal folds producing an unwanted sound during phonation.

Causes of Hoarseness

Many causes of hoarseness are multi-factorial and are outlined below:

Metabolic	- Gastro-oesophageal reflux (GORD) - Laryngopharyngeal reflux (LPR)
Trauma	- Chronic coughing i.e. bronchiectais - Direct trauma to neck
Infective	- Acute laryngitis (usually after URTI) - Fungal (asthmatics/COPD/immunocomprmised)
Inflammatory	- Chronic coughing - GORD - Rhinosinusitis (post nasal drip)
Iatrogenic	- Prolonged tracheal intubation - Nerve or structural damage during surgery i.e. Head and neck or cardiothoracic. - Inhaled steroids (asthmatics/COPD)
Idiopathic	- Presbyphonia
Neoplastic	- Laryngeal carcinoma - Lung cancer - Thyroid carcinoma - Lymphoma - Other head and neck tumours
Congenital	- Congenial vocal cord paralysis - Glottic Web
Arteriovenous	- Thoracic aortic aneurism (laryngeal nerve palsy) - CVA - Vocal cord Haemorrhage
Neurological	- CVA - Motor neurone disease - Myasthenia gravis - Parkinson's disease
Benign	- Functional dysphonia - Spasmodic dysphonia - Muscle tension dysphonia - Vocal cord nodules (singers nodes) - Voice misuse - Reinke's oedema - Polyps - Papillomas
Endocrine	- Hypothyroidism

Table 2: Cause of hoarse voice[iii iv]

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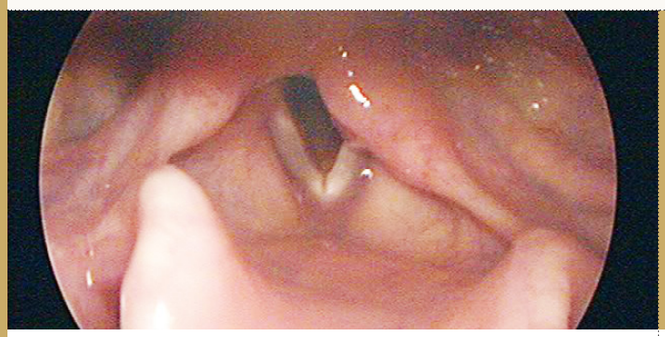

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History[iv]

A good, focused history will not only allow diagnosis in most cases, it also help with deciding which investigations are appropriate. Topics that should be covered in the history include:

1. Duration of symptoms

Patients presenting to an ENT clinic with hoarseness will have usually had their symptoms for at least 3 weeks (unless there is particular concern about neoplastic causes). It is also important to elicit pattern of their symptoms. Is it sudden or gradual? Sever or mild? Episodic or constant?

2. Associated symptoms

Ask about dysphagia or pain as this could be a sign of malignancy. Get a full history about any reflux symptoms such as offensive taste in the mouth, chronic cough or throat clearing. The Reflux Symptom Index (RSI) can be used to help identify patients who may have reflux disease (see table 3). Scores >13 show severe disease.

3. Lifestyle patters and risk factors for neoplastic causes

Smoking and alcohol consumption are the two most important risk factors for developing laryngeal cancer. Other considerations should include age and diet. Smoking and alcohol also contribute to gastro-oesophageal reflux.

4. Current medication

Of importance are any immunosuppressant drugs and high dose inhaled steroids.

5. Recent illness or surgery

Recent upper respiratory tact infections and secondary viral laryngitis are very common causes of hoarseness and as such must be noted. It is also worth taking a comprehensive surgical history. Prolonged intubation can result in a horse voice. Head and neck or thoracic surgery carries the risk of damage to nerves involved in phonation.

6. Occupation and voice use

Teachers, lawyers, salespersons, actors and singers commonly present with voice problems due to misuse or abuse.

7. Any direct trauma to head and neck

Laryngeal fracture can be associated with severe trauma and there is a danger of airway compromise, if this happens. Mild direct trauma to the neck can result in bruising or swelling of the vocal cords.

8. How is this affecting their day to day life

This is a very important question to ask as it tells you what the patients maybe expecting you to do. As well as simply asking the patients directly there are a number of well formulated questionnaires that can be used to quantify how the condition is affecting quality of life. The most widely used of these is the Voice Handicap Index (VHI) (see figure 2)[vi]. Other methods include the Vocal Performance Questionnaire (VPQ) and Vocal Symptom Scale (VoiSS). Any three of these methods can be used.

In the last MONTH, how did the following problems effect you	0= No problem 5 = Sever problem					
1. Hoarseness or problems with your voice	0	1	2	3	4	5
2.Clearing your throat	0	1	2	3	4	5
3.Excess throat mucus or post nasal drip	0	1	2	3	4	5
4.Difficulty swallowing foods, liquids or pills	0	1	2	3	4	5
5. Coughing after eating or lying down	0	1	2	3	4	5
6. Breathing difficulties or choking episodes	0	1	2	3	4	5
7. Lump in your throat or sensation of something sticking in your throat	0	1	2	3	4	5
8. Troublesome or annoying cough	0	1	2	3	4	5
9. Heartburn, chest pain, indigestion or stomach acid coming up	0	1	2	3	4	5
Total Score						

Table 3 – Reflux Symptom Index (RSI)

Examination

A general examination of the neck is needed initially – inspect for swellings and scars from previous surgery. Palpate for lymphadenopathy and thyroid enlargement. Inspect the patient's mouth for signs of inflammation of the oropharynx for post nasal drip. Also look at the tongue for signs of candidia infection.

Perceptual evaluation of voice is essential when assess dysphonia. The GRBAS scale (Grade. Roughness, Breathiness, Asthenia and Strain) can be used to do this. There have been a number of studies showing that it is highly reproducible and can be used by clinicians or patients without voice training[vii][viii].

In an ENT clinic setting, flexible nasendoscopy or indirect laryngoscopy can be performed to visualise the larynx and vocal cords. Two main features must be assessed when visualising the vocal cords these are:

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1. Masses

On direct visualisation any masses on or around the vocal cords may need further imaging

2. Vocal cord palsy

Vocal cord palsies can be due to a number of causes but should prompt for further investigation (see below). It is important to assess the position of the vocal cords.

The added benefit of flexible nasendoscopy is also allows examination of the nasal cavity and post nasal space. See box 1.

Flexible nasendoscopy

Indications:
Examination of nasal cavity, post nasal space, tongue base, vocal cords
Procedure:

- Topical anaesthetic is sprayed into the nostrils i.e. Xylocain spray *(Important to ask for allergies before hand, give tissues to the patient and also warn them their throat may also become numb and they should refrain from eating and drinking for an hour after the procedure).*
- Small amount of lubricant to scope *(careful not to cover tip and obscure your view)*
- Under direct vision place scope into nasal vestibule Advance the scope along the floor of the nasal cavity while looking at surrounding structures
- Once at the post nasal space inspect the eustacion tube opening and then direct the scope downwards and advance slowly until the base of the tongue and the vocal cords are seen

Box 1: Procedure of flexible nasendoscopy/Videostroboscopy[ix]

Videostroboscopy works much in the same way as flexible nasendoscopy but images of the vocal cords are recorded and assessed as slower speeds. Analysis and measurement of voice can also be used. These two techniques are usually seen in specialist voice clinics.

Investigations

Further investigations are only required, if the diagnosis is uncertain or there is suspicion of underlying malignancy. Good history and visualisation of the vocal cords will dictate which investigations are required. Observational studies have shows that fewer than twenty percent of referrals for hoarseness are found to have underlying malignancy[x]. If a vocal cord palsy or mass is seen at flexible nasendoscopy then prompt imaging must be attained to assess for malignancy[xi]. Three main imaging modalities are used:

1. Plain X-rays

Plain radiographs of the chest can be carried out, if there is a suspicion of an underlying cheat malignancy. High risk groups would be smokers and those who have a spontaneous unilateral vocal cord palsy (commonly left). X-rays can be done to assess if CT scanning of the thorax is needed[ix].

2. Computer Tomography (CT) +/- contrast

CT scanning is used to look for lesions along the path of the vagus nerve from the skull and below. It is also good for imaging boney infiltration and cervical lymph node involvement. The advantage of CT imaging is that further exploration of the thorax and abdomen for staging purposes can be carried out, if laryngeal malignancy is revealed. The main disadvantage is the high dose of radiation delivered to the neck and thyroid gland. It is therefore advised that CT should not be used in children if MRI is available[xii].

3. Magnetic Resonance Imaging (MRI) +/- gadolinium contrast

MRI scanning is the modality of choice when imaging lesions that are located in the brain stem or base of the skull. In a prospective study of patients with nasopharyngeal carcinoma only forty percent were found to have skull base invasion using CT scanning compared with sixty percent with MRI scanning[xiii]. Vocal cord palsy associated with other lower cranial nerve palsies should have an MRI with gadolinium enhancement as there maybe a lesion within the skull base or brain stem. MRI can also be used to stage and assess laryngeal cartilage involvement. A prospective study has shows that MRI has a higher sensitivity in detecting neoplastic invasion of laryngeal cartilage compared with CT scanning[xiv xv]. As mentioned above MRI scanning is the modality of choice in children. Standard contra-indications apply with MRI scans (pace makers and implants not compatible with magnetic fields)

Consider Bloods test such as thyroid function tests in patients suspected of having a thyroid disease.

The patient may also be listed for a microlaryngoscopy to better visualise the larynx under a general anaesthetic. The down side to this is that the cords cannot be been assessed during use.

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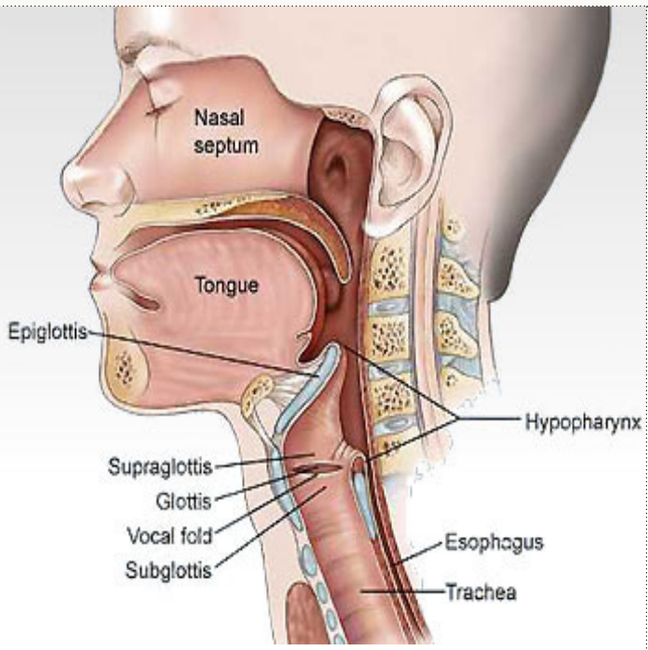

Management

Management is split into general and specific:

1. General

Voice hygiene has been proven to help treat patients with non-organic hoarseness[xvi]. This includes:

- Good hydration[xvii xviii]
- Reduction/Cessation of smoking and alcohol intake
- Reduce vocal strain/misuse
- Reduce caffeine consumption[xix]

Voice therapy is a form of speech therapy, which teaches patients a variety of techniques to improve their voice such as relaxation and voice production. It has been found to be as effective as many first line treatments for organic (such as polyps) and non-organic cases[xx xxi xxii]. A recent Cochrane review (2007) showed that voice therapy was effective in treating functional dysphonia and recommended it as first line treatment[xxiii].

If the above measures do not work and the vocal cords look normal on examination then referral to a specialist voice clinic is the next step. Here further investigations such as videostroboscopy and in depth assessment of voice (acoustic signal measurement) can be carried out.

2. Specific

Outlined in table 4 are benign causes of hoarseness, their presenting symptoms/signs and treatment options. Treatment of vocal cord palsy, due to a non-neoplastic cause aims to medialise the paralysed cord so that the working cord can close the glottis and phonate. There are two options for this

- Injection therapy

Collagen, fat, Teflon or silicone can be injected lateral to the paralyzed cord causing it to move to the midline. This procedure can be carried out under local anaesthetic. NICE guidelines advocate the use of collagen injection for short term symptomatic relief but note that there is a lack of evidence for long term efficacy[xxiv]

- Thyroplasty

An implant is inserted thought an incision in the thyroid lamina. This can be done under local anaesthetic

Condition	History	Examination	Management
GORD/LPR	Chronic cough, Clearing of throat, High RSI score, Episodic, Worse with spicy food or alcohol.	Inflammation of the laryngeal mucosa on flexible nasendoscopy	Avoid spicy food and eating before bed No evidence for oral PPI use and so should only be used if dietary methods fail or very high RSI score (>13)[xxv xxvi] Improvement seen with liquid alginate suspension[xxvii] If there is oesophageal sphincter laxity consider Nissens Fundoplication
Vocal cord (singers) nodules	History of voice over use or abuse	Bilateral fibrous nodules on vocal cords	Voice therapy if first line treatment Persistent nodes can removed via CO2 laser or micro dissection under microlaryngoscopy
Vocal cord Polyps		Unilateral	
Laryngeal Papillomas	Hoarsness and if very large can cause airways compromise	Polyps are seen on direct visulisation	Surgically treated with CO2 laser removal [xxviii]
Reinke's Oedema	Smokers, voice overuse, voice becomes deep	Bilateral swollen vocal cords	Smoking cessation, Occasionally can be associated with under active thyroid Surgical removal of fluid

Table 4 – Common benign causes of hoarseness and their management

Trainee Tips

1. Through history from patient will reveal most diagnoses.

2. Ask patients about disability caused by symptoms.

3. Examination should always include palpation of cervical lymph nodes and visualisation of vocal cords.

4. Hoarseness lasting longer than 3 weeks in high risk groups (smokes, alcohol consumption) must exclude malignancy and should be referred to ENT clinic.

5. Radiological investigations for patients with vocal cord palsy or mass, who has not had recent thyroid or thoracic surgery.

6. Conservative measures for benign disorders include, voice hygiene, reduce GORD/LPR and voice therapy..

HOARSE VOICE

Ameet Gupta

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Hoarse Voice Questions

A Reinke's oedema
B Vocal cord polyps
C Lung cancer
D Thyroid carcinoma
E Vocal cord papilloma
F Reflux disease
G Functional dysphonia
H Benign vocal cord nodules

For each of the following pateints select the most likely answer/ diagnosis from the list above. Each option may be used once, more than once or not at all.

1. A 71 year old gentleman is referred by his GP following a 6 week history of a weak voice. He feels otherwise well but on direct questioning he admits to some unintentional weight loss and has been a lifelong smoker. Nasendocopy shows the left vocal cord fixed in the paramedian position.

2. A school teacher has been referred by her GP with a 4 week history of a change in her voice. There is no weight loss or systemic illness but she looks tired and explains that she has been very stressed with her new class. She drinks moderately and is now smoking 30 cigarettes a day. The vocal cords look inflamed and swollen but move normally.

3. A 9 year old boy has come to see you with a hoarse voice. His father tells you that he has been in twice before with the same thing which was fixed with a quick operation.

4. You see a 51 year old farmer who has had a hoarse voice for 9 weeks. He occasionally gets heart burn but feels otherwise well. He is a non-smoker but drinks 20 units of home grown cider a day. Nasendoscopy shows swollen and inflamed looking vocal cords.

5. A 21 year old local karaoke legend is talent spotted and booked to record an album. After a month of recording she notices that her voice is more 'breathy' and her manager Mr C thinks her voice has become hoarse. She is a non-smoker, feels otherwise well and has not lost weight. Nasendocopy reveals fibrous looking nodules on both vocal cords.

Answers

1. C 2. G 3. E 4. F 5. H

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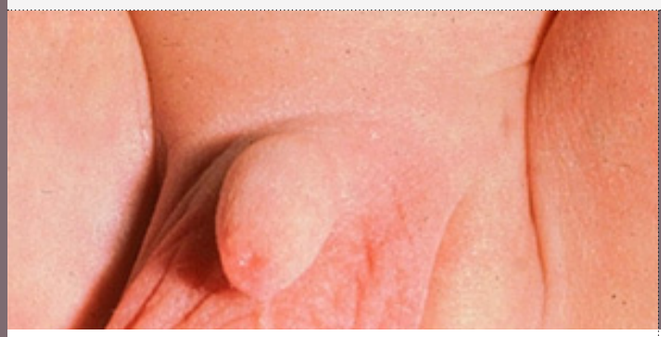
UNDESCENDED TESTICLES

Reshma Doodnath, John Gillick



Undescended Testicles.
Paediatric Surgery.

Undescended Testes

One of the most common referrals seen in the paediatric surgery out-patients clinics is the Undescended Testes (UDT). Cryptorchid testes are testes that are not located within the scrotum, and the incidence is reported to be 4-5% at birth. By 3 months of age, half of these would have descended into the scrotal sac, leaving about 1-2% of boys with UDT. At the time of referral, it is very important to distinguish palpable from impalpable UDT. Testicular position has significant implications for subsequent life in terms of risk of torsion, trauma, infertility and malignancy.

Case History

An 18 month old boy was referred by his GP with a left UDT for surgical management. A full physical examination was performed. On abdominal examination, the abdomen was soft and non tender. On examination of the scrotum, the right testicle was palpable in the right hemi-scrotum. The left testicle however was palpable in the left inguinal canal but was unable to be brought down into the scrotum. He was booked in to have an Examination Under Anaesthesia (EUA), and possible left orchidopexy. At surgery, EUA revealed a palpable left testicle in the superficial inguinal pouch that could not be brought down to the scrotum, and a normal right testicle in the scrotum. A left orchidopexy was performed and the patient was discharged home on the same day. He was seen in the out-patient's clinic 6 weeks later, and the groin and scrotal wounds were well healed and the both testicles were palpable in the scrotum.

Introduction

Crytorchidism is an absence of one or both testes in the scrotum. This is due to a failure of the testicle to migrate from its embryonic abdominal position, through the inguinal canal and into the ipsilateral scrotum. It is thought to be the most common congenital genitourinary abnormality in male children, and is reported to have an incidence of 4-5% in full term neonates, and up to 30% in premature boys (1). The treatment of UDT is very well justified by the increased risk of torsion and trauma, as well as infertility, malignancy, and an associated inguinal hernia (2). About 20% of cryptorchid testicles are impalpable, with the majority being palpable along the path of descent (see Figure 1). An important history and physical examination are essential in order to accurately plan management.

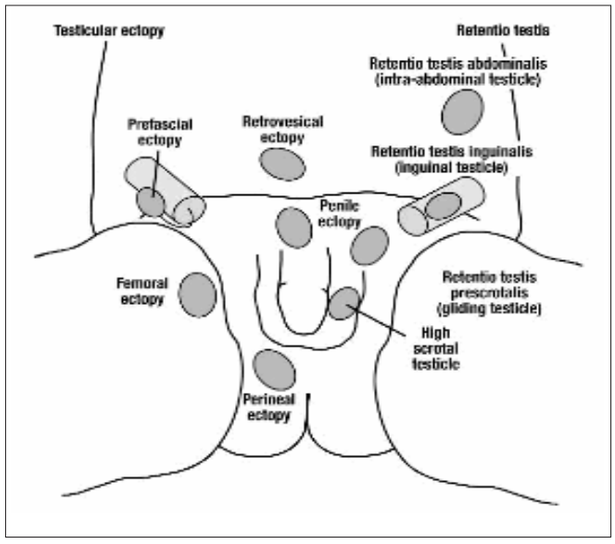


Figure 1 – Different testicle locations in cryptorchidism
(Taken from Mathers MJ et al: The undescended testis: diagnosis, treatment and long-term consequences, 2009)

Background

The mechanisms of descent are not completely known and are complex. They classically involve two phases, namely the transabdominal phase and the inguinoscrotal phase (3). In the transabdominal phase, which happens between the 8th and 15th week of gestation, the testis remains anchored to the inguinal area by the swollen gubernaculum, which prevents the testis from ascending as the embryo enlarges (3, 4). In the inguinoscrotal phase, which occurs between the 28th and 35th week of gestation, the testis is guided by the gubernaculum from the inguinal area into the scrotum (5). Cryptorchidism is usually due to abnormalities in the inguinoscrotal phase of descent, whereas the transabdominal phase is much less often disrupted (6, 7).

UNDESCENDED TESTICLES

Reshma Doodnath, John Gillick

Diagnosis

A full history and clinical exam is the key to an accurate diagnosis. Clinical examination should be performed with warm hands, in a quiet room, with the child supine, comfortable and calm. Testicular examination should always be a two-handed technique - one hand strokes from the upper iliac spine along the inguinal canal towards the pubic bone, and the other hand attempts to palpate the testicle. This is in an attempt to push the testicle towards the scrotum, causing it to become positioned at the outer inguinal ring (8). A palpable UDT immediately slides back to the inguinal ring when released. This is different from the retractile testicle, which is usually in the scrotal sac, but disappears on activation of the cremasteric reflex. About 80% of cryptorchid testicles are palpable. However in 20% cases, a testicle will not be able to be palpated and may be located intra-abdominally. There is not usually the need for diagnostic laboratory investigations, except in certain situations e.g. bilateral impalpable testis.

Treatment

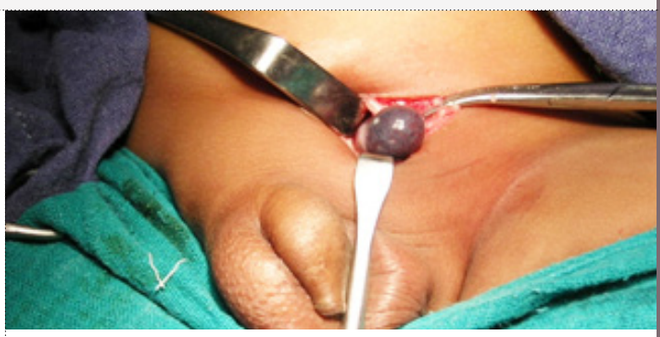
The aim of treatment of UDT is to bring the testis to the ipsilateral scrotum before the age of 2 years old, but optimally, between 6 months to 18 months. This gives the best chance to function in an endocrine capacity, contribute to fertility and help early detection of malignancy (9).

Palpable Testis

Surgical intervention is the treatment of choice and an examination under anaesthesia is performed initially to ensure that retractile testicles aren't mistaken for UDT, in which case, no surgical intervention is necessary. Once it is confirmed that the testis is palpable and undescended, an orchidopexy is performed. The classical inguinal approach involves opening the inguinal canal, dissection of the spermatic cord, ligation of the patent processus vaginalis that is usually present and the placement of the testis in the Dartos pouch.

Unilateral Impalpable Testis

When the testicle is impalpable, what needs to be determined is whether the testis is present and located intra-abdominally, or whether testicular agenesis has occurred and a vanishing testis is present. Diagnostic laparoscopy has proven to be very advantageous in that, besides being a diagnostic tool, it also has therapeutic potential. It is initially used to identify testicular presence and position and then a decision about whether a one stage or two- stage orchidopexy can be done (10). Careful dissection of the spermatic vessels as well as preservation of the vessels that supply the vas deferens is fundamental to ensure testicular preservation (2). The two-stage Fowler-Stephens operation, with initial division of the testicular vessels, which can be done laparoscopically, is now used for those testes which cannot be brought to the scrotum with one operation (10).



Bilateral Impalpable Testis

In the event that there are bilateral impalpable testes, an endocrine opinion should be sought. In a newborn male with bilateral UDT, a female karyotype with underlying adreno-genital syndrome must be ruled out (8). A Human Chorionic Gonadotrophin (HCG) stimulation test should be performed. This reflects the presence of testicular tissue and so is only useful in bilateral cryptorchidism. Once testicular tissue is present, testosterone levels rise to twice the baseline value. A positive response suggests that testicular tissue is present, and so laparoscopy can then be performed (8).

Retractile Testis

In almost all cases, retractile testes do not require surgery. In a small number of cases however, it has been shown that retractile testes may ascend, and these cases may need follow up until resolution occurs (11).

Complications

Complications of orchidopexy include wound infection and haematoma, and more specifically testicular re-ascent and testicular atrophy. Factors that influence testicular atrophy include damage to the vas deferens and testicular vessels, the severity of the original abnormality (e.g. the risk of testicular atrophy is significantly higher in impalpable testes compared with palpable testes) and previous surgery.

UNDESCENDED TESTICLES

Reshma Doodnath, John Gillick

Undescended Testicles.
Paediatric Surgery.

Importance of Treatment

The small risk of atrophy and necrosis has been is thought to be due to poor quality of testicular tissue and the presence of a Patent Processus Vaginalis (PPV), which if full, may compress spermatic vessels causing testicular necrosis (4). Decreased fertility has also been reported and there is convincing evidence that a testis situated in the abdomen or inguinal canal is unable to produce spermatozoa and that spermatogenesis is improved, if the testis is placed in the scrotum because of the cooler temperature (12, 13). The relative risk of testicular tumours is 5 times higher than in the general population (14) and it is has been reported that 10% of all testicular malignancies are associated with cryptorchidism (15). Surgery itself doesn't decrease the risk of cancer, but rather, it allows self examination of testicles and earlier detection. Trauma and torsion are also more common as testicular attachments of UDT are looser (4).

Conclusion

Early detection and referral of undescended testicles to a paediatric surgeon for appropriate management is important and a delay in this may have significant consequences with regards to fertility and detection of testicular tumours.

EMQ's - CRYPTORCHIDISM

Answer True or False to each of these:

1. Cryptorchidism

(A) Occurs in 20% full term neonates
(B) Does not occur in premature babies
(C) Refers to the absence of one or both testicles in the scrotal sac
(D) May be a sign of an underlying endocrinological abnormality

2. Embryology

(A) Testicles originate from the mesothelial layer of the peritoneum
(B) The trans-abdominal phase of migration
occurs between the 15th-18th week of gestation
(C) The inguinoscrotal phase of migration occurs
between the 28th and 35th week of gestation
(D) The gubernaculum pulls and translocates
the testicle down into the developing scrotum

3. Clinical setting

(A) A detailed history and full physical exam is necessary
(B) Adequate examination is performed using cold hands
(C) A bimanual examination is necessary
for accurate examination of undescended testicles
(D) A retractile testicle is the same as an undescended testicle

4. Treatment

(A) Undescended testicles should be
operated on only after the age of 4 years old
(B) Surgery for undescended testicles
decreases the risk for testicular tumours to develop
(C) Patients with undescended testicles
are likely to have a patent processus vaginalis
(D) Diagnostic laparoscopy has no role
in the management of impalpable testicles

5. Differential diagnosis of an empty scrotum include:

(A) Retractile Testis.
(B) Testicular Atrophy
(C) Ectopic Testis
(D) The ambiguous group.

UNDESCENDED TESTICLES

Reshma Doodnath, John Gillick

Answers

Question 1.
(A) – F (B) – F (C) – T (D) –T

Question 2.
(A) – T (B) – F (C) – T (D) – T

Question 3.
(A) – T (B) – F (C) – T (D) –F

Question 4.
(A) – F (B) – F (C) – T (D) –F

Question 5.
(A) – T (B) – F (C) – T (D) –F

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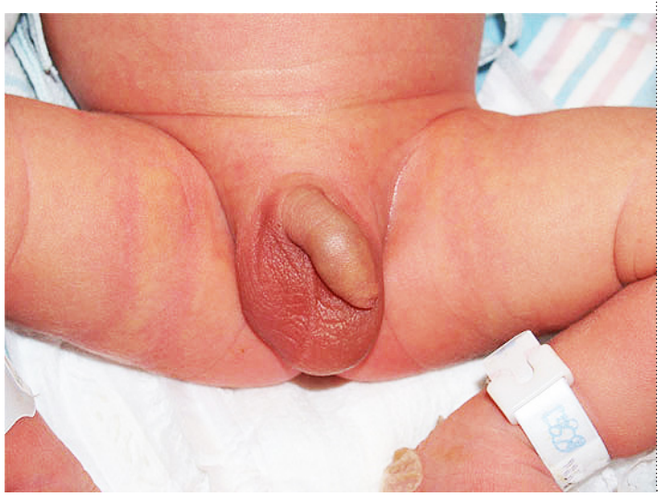

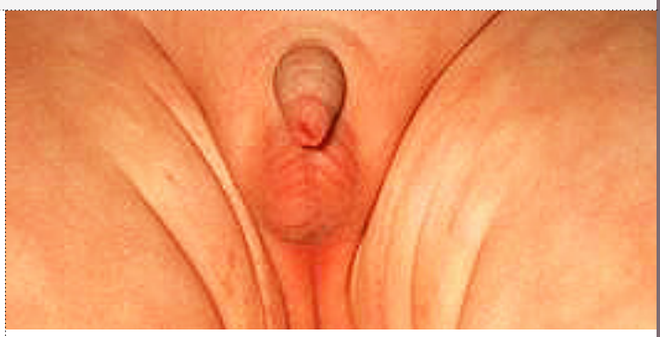

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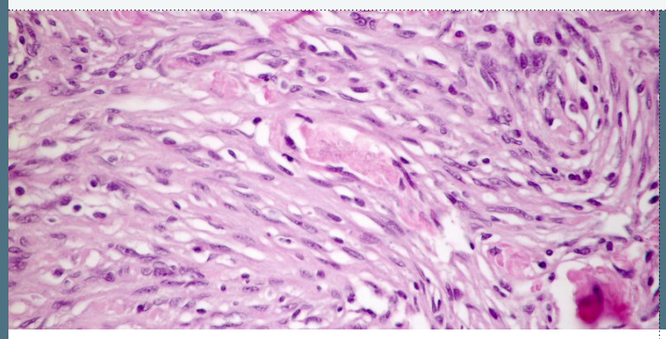
MENINGIOMA

Hani Marcus



Meningioma.
Neurosurgery.

Abstract

Meningiomas are tumours thought to arise from arachnoid cap cells. They represent approximately a fifth of all intracranial tumours, and are more common with advancing age, and in females. Most meningiomas are histologically benign tumours and the five-year survival for typical meningiomas exceeds 80%. In many cases patients with small and asymptomatic meningiomas may be managed expectantly with serial imaging. If treatment is required complete surgical excision remains the gold standard, and is curative in most cases. The role of radiotherapy is controversial, but advocates have suggested therapy in patients with incompletely resected or surgically inaccessible meningiomas (for example around the cavernous sinus). Chemotherapy is very limited use and usually reserved for patients in whom all other treatment modalities have failed.

Vignette

A 55 year old right handed lady presents to Accident and Emergency following a generalised tonic-clonic seizure. She is otherwise healthy and neurological examination is unremarkable. A CT Brain demonstrates a left frontal extra-axial brain tumour that vividly enhances with contrast. There is also associated hyperostosis.

What is the likely diagnosis?

What other symptoms and signs might the patient have presented with?

Which is further investigations would you request to complete your assessment?

What are the treatment options available to the patient?

Review

Definition

The term meningioma was first coined by Harvey Cushing in 1922 to describe tumours arising from the meninges[1]. Subsequent cytological studies have suggested the origin of meningiomas as arachnoid cap cells – a group of morphologically distinct arachnoid cells, often within arachnoid villi, that are involved with the resorption of cerebrospinal fluid.

Epidemiology

Meningiomas represent approximately a fifth of intracranial tumours but are relatively uncommon in the general population with an incidence of approximately 2 per 100,000 population[2, 3]. The true incidence is likely to be higher, as many meningiomas are asymptomatic. Studies reviewing cases of incidental meningiomas found at autopsy have reported a prevalence of about 2%[4, 5,] and recent Magnetic Resonance Imaging (MRI) studies have supported these findings[6, 7].

The incidence of meningiomas increases with advancing age and there is a female preponderance with a male-to-female ratio of approximately 1:23.

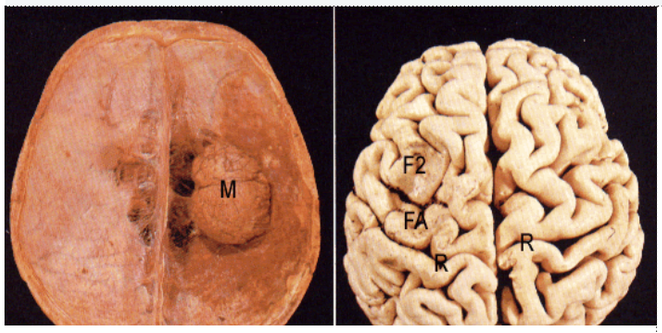
Aetiology

The aetiology of meningiomas is usually unknown with few cases attributed to an inherited genetic predisposition and even fewer to environmental risk factors. Nevertheless, a number of factors have been identified.

The inherited genetic syndrome neurofibromatosis type II is well associated with vestibular schwannomas but can, it may be also predispose to other tumours such as meningiomas. Other inherited genetic syndromes such as Multiple Endocrine Neoplasia type I can also occasionally be associated with meningiomas.

MENINGIOMA

Hani Marcus



A number of environmental agents are currently being investigated including oestrogen exposure, head injury, and mobile phone use, but at present the only recognised acquired risk factor for meningiomas is exposure to ionising radiation. Epidemiological data showing a rise in the incidence of meningiomas in survivors of atomic bomb explosions in Hiroshima and Nagasaki provided initial evidence for a causal link[8]. Subsequent observational studies have confirmed a relationship between radiation exposure, even the relatively small doses used in dental radiography, and the development of brain tumours including meningiomas[9, 10].

Pathology

Meningiomas are histologically heterogenous but the majority may be considered as either meningothelial or fibroblastic, with the transitional variant having features of both. Meningothelial tumours are composed of arachnoid cells arranged in lobules, often with whorls and so-called psammoma bodies (round collections of calcium resulting from degenerated whorls). Fibroblastic meningiomas are composed of fascicles of fibre-like cells with an abundance of interstitial collagen. The World Health Organisation (WHO) identifies three distinct grades: Grade I (benign) meningiomas are by far most common accounting for approximately 80% of cases that present. Grade II (atypical) meningiomas are characterised by increased mitotic activity or 3 or more features of increased cellularity, small cells, prominent nucleoli, sheet like growth, necrosis and brain invasion. Grade III (anaplastic or malignant) meningiomas are defined by histological features of frank malignancy such as a very high mitotic index or obviously malignant cytology[11].

Macroscopically about 90% meningiomas are located supratentorially[3], and the majority are located in the convexity, parasagittal or sphenoid wing regions[12]. Benign meningiomas are typically firm, lobulated or globose masses that are anchored to the dura mater, are well circumscribed and do not infiltrative the brain itself. Occasionally meningiomas may have a flattened appearance and these are termed en plaque meningiomas. Hyperostosis may occur and, because clusters of meningioma cells have convincingly been found in affected bone, is generally thought to be due to tumour infiltration[13-17].

Meningiomas are generally slow growing although some exhibit unusual growth kinetics. A recent prospective study demonstrated that patients younger than 60 years of age, an initial tumour diameter greater than 25mm, and the absence of calcification were all strongly associated with a shorter time to progression[18].

Presentation

Meningiomas may be asymptomatic and are increasingly being diagnosed incidentally as a result of the greater availability of neuroimaging[6, 7]. Symptomatic meningiomas often present insidiously reflecting their generally slow growth, with neurological deficits, raised intracranial pressure, or seizures.

Tumours located supratentorially may result in a wide range of neurological deficits associated with loss of function of different regions of the frontal, parietal, temporal and occipital lobes as summarised in Table 1. Supratentorial tumours may also occasionally cause neurological deficits through direction compression of the olfactory or optic nerves (and more rarely the cranial nerves traversing the cavernous sinus). Foster Kennedy described the triad of ipsilateral anosmia, ipislateral optic atrophy, and contralateral papilloedema, which is associated with meningiomas of the olfactory groove, falx, sphenoidal wing or subfrontal regions[19].

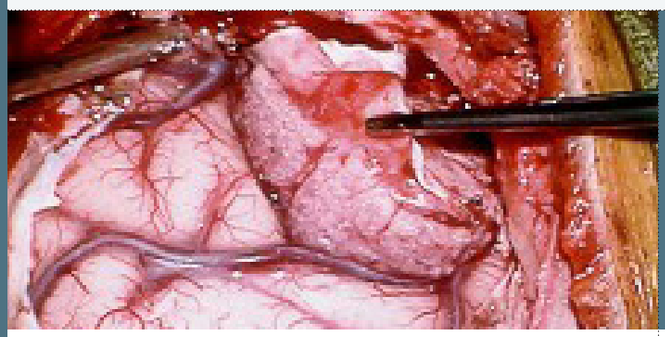
Region	Deficit
FRONTAL LOBE	
Precentral gyrus	Contralateral monoparesis or hemiparesis
Inferior frontal gyrus of the dominant hemisphere (Broca's area)	Language impairment (expressive or "non fluent")
Supplementary motor area	Paralysis of eye and head movement to opposite side
Prefrontal areas	Inappropriate behaviour and loss of executive function
Paracentral lobule	Sphincter incontinence
PARIETAL LOBE	
Postcentral gyrus	Contralateral cortical sensory impairment; may include astereognosis
Supramarginal and angular gyri of the dominant hemisphere	Language impairment (receptive or "fluent")
Optic radiation	Lower homonymous quadrantanopia
Dominant side	Left-right agnosia, finger agnosia, acalculia and agraphia (Gerstmann's syndrome)
Non-dominant side	Neglect and anosognosia, dressing apraxia, geographical agnosia, and constructional apraxia
TEMPORAL LOBE	
Auditory cortex	Hearing (*only bilateral cortical damage can result in hearing loss*)
Superior temporal gyrus of the dominant hemisphere (Wernicke's area)	Language impairment (receptive or "fluent")
Middle and inferior temporal gyrus	Short term and Long term memory Smell
Optic radiation (Meyers loop)	Upper homonymous quadrantanopia
OCCIPITAL LOBE	Homonymous hemianopia Cortical blindness (bilateral lesions)

Monoparesis = Weakness of one limb; Hemiparesis = Weakness of one side of the body; Astereognosis = Inability to identify objects by touch alone; Left-right agnosia = Inability to distinguish left from right; Acalculia = Inability to perform simple mathematical tasks; Agraphia = Inability to write; Anosognosia = Not aware of disability; Dressing apraxia = Inability to dress e.g. getting arm into pyjamas; Geographical apraxia = Inability to navigate e.g. patient cannot find his bed in ward; Constructional apraxia = Inability to copy geometrical pattern

Table 1. Focal neurological deficits by brain lobe affected (Adapted from Neurology and Neurosurgery Illustrated[40])

MENINGIOMA

Hani Marcus



Meningioma.
Neurosurgery.

Infratentorial tumours may also lead to focal neurological deficits through loss of function of different regions of the cerebellum and brainstem, but more commonly present with progressive cranial nerve palsies. Meningiomas located in the cerebellopontine angle, e.g. may present with progressive unilateral sensorineural hearing loss, tinnitus and vertigo (which make them difficult to distinguish clinically from vestibular schwannomas).

Raised intracranial pressure can result from the brain tumour itself, the associated cerebral oedema or hydrocephalus. Raised intracranial pressure can lead to a number of symptoms including headache, nausea (vomiting) blurred vision (diplopia) and lethargy. On examination patients may have a reduced level of consciousness, papilloedema or ophthalmoplegia (often the result of abducens nerve palsies, which are particularly susceptible to the affects of raised intracranial pressure due to their long course). In extremis patients may develop signs of brainstem herniation.

Seizures occur in approximately a third of patients with brain tumours[20] and may be partial or secondary generalised. Certain tumours and locations appear to favour the development of seizures. Meningiomas are recognised as being particularly epileptogenic compared with other intracranial tumours. Infratentorial tumours are almost never associated with seizures.

Investigation

The investigation of choice for patients with suspected meningioma is Magnetic Resonance Imaging (MRI) with intravenous contrast agent although Computed Tomography (CT) is often performed initially due to its greater availability[21]. Blood tests have little diagnostic value but are generally performed to ensure patients are optimised pre-operatively.

A number of features on MRI help distinguish extrinsic tumours such as meningiomas from intrinsic tumours[21]. Extrinsic tumours may be associated with displaced subarachnoid vessels, and a displaced and expanded subarachnoid space. Cortical grey matter between the tumour and white matter (if visible) is also suggestive of extrinsic lesions. There is usually vivid, often homogenous, contrast enhancement as lesions lie outside the blood-brain barrier (note that high grade intrinsic lesions enhance heterogeneously due to break down of the blood-brain barrier). Finally, in the special case of meningiomas, there is often a broad dural base and may be related hyperostosis.

Angiography is occasionally performed to allow visualisation of feeding arteries for operative planning and if pre-operative embolisation is being considered. Whole-body CT scans to screen for primary tumours are rarely necessary unless radiological appearances of the meningiomas are atypical, and cerebral metastases remain a possibility.

Management

The initial goals of management are to stabilise the patient and alleviate their presenting symptoms. High dose steroids (usually dexamethasone as it is very potent and has almost no mineralocorticoid effects) are generally given to reduce cerebral oedema[22] and in patients presenting with seizures, anticonvulsants are also used.

Once stabilised, the next step in management is to treat the underlying meningioma. Patients with small meningiomas that have little or no symptoms may be managed conservatively with observation and serial imaging to ensure no significant growth occurs. The frequency and duration of follow up in these patients in controversial[23] but many clinicians would nonetheless advocate surveillance over several years.

If treatment is required complete surgical excision remains the gold standard, and is curative in most cases[24]. The indications for surgery are to obtain tissue for histological diagnosis in cases of uncertainty, to treat patients managed expectantly in whom significant growth occurs, and to provide rapid symptomatic relief and neurological improvement in patients with mass effect or hydrocephalus. The extent of resection may be described according to Simpsons criteria as I-V (Table 2). There is considerable evidence that the risk of recurrence depends mostly on the degree of resection[24]. Contemporary operative neurosurgery makes use of a number of techniques such as image guidance and microscopy to improve resection while techniques preserving eloquent cortex. Advances such as intra-operative MRI and robotic neurosurgery are currently under development and have the potential to further improve outcomes[25].

MENINGIOMA

Hani Marcus

Radical resection	
I	Complete excision including dura and bone
II	Complete excision and reliable coagulation of dural attachments
Non-radical resection	
III	Complete excision of solid tumour, but insufficient dural coagulation or bone excision
IV	Incomplete resection with visible residual tumour
V	Biopsy

Table 2. Simpsons classification of the extent of meningioma resection

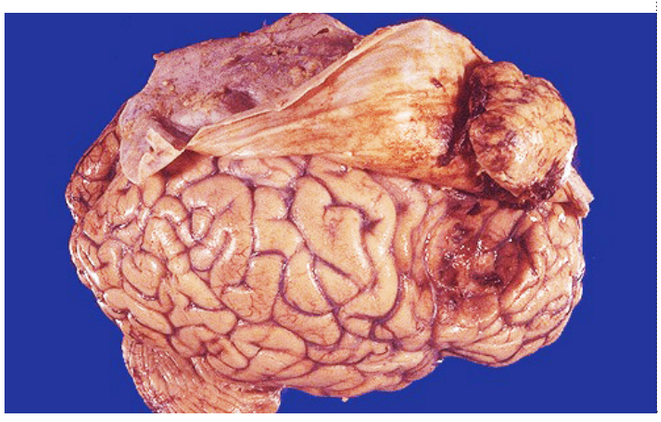
The role of radiotherapy in the treatment of meningiomas is controversial. Although initially thought to be radioresistant, a recent review of the literature identified several cohort studies which suggest increased local control in patients with partially resected meningiomas[26]. Efforts are currently underway to address this problem with a multicentre randomised controlled trial comparing watchful waiting against adjuvant irradiation[27].

Stereotactic radiotherapy has also been advocated in lieu of surgery as a primary treatment strategy for relatively small (<35mm) inaccessible meningiomas (e.g. around the cavernous sinus), particularly in patients that are deemed poor surgical candidates such as the very elderly. Several case series' have reported the use of stereotactic radiotherapy in this manner and, notwithstanding the relatively small numbers (<100 patients) and short follow up (<5 years), appear to demonstrate local tumour regression or control in most cases[28-33].

Chemotherapy is of very limited use in the treatment of meningiomas. The preponderance of meningiomas in females, and the large proportion of tumours that express progesterone receptors, have led to many attempts at hormonal therapy. However, a randomised controlled study on the use of the progesterone antagonist Mifepristone on unresectable meningiomas did not support its use (median progression free survival was 10 months in patients given Mifepristone versus 12 months in the placebo arm)[12]. Other chemotherapeutic agents such as hydroxyurea have also been trialled with variable results[34-38].

Prognosis

Overall the prognosis for patients with meningioma is excellent. In a population based cancer registry series of patients, the overall survival exceeded 80% at 5 years, and remained about 70% at 15 years from diagnosis[39].



MCQs

1. Which cells do meningiomas arise from?

A. Oligodendrocytes
B. Astrocytes
C. Arachnoid cap cells
D. All of the above
E. None of the above

2. Which of the following statements concerning the epidemiology of meningiomas is true?

A. They are more common in children
B. They are more common in females
C. They are the most common primary intracranial tumour
D. All of the above
E. None of the above

3. Which of the following symptoms and signs might occur in a left temporal lobe meningioma?

A. Receptive dysphasia
B. Right upper quadrantanopia
C. Episodes of deja vu
D. All of the above
E. None of the above

4. Which of the following statements concerning the investigation of meningiomas are true?

A. Blood tests are often diagnostic
B. A CT Chest-Abdomen-Pelvis is almost always required
C. A CT Head is the investigation of choice
D. All of the above
E. None of the above

5. Which of the following radiological features may occur with extra-axial brain lesions?

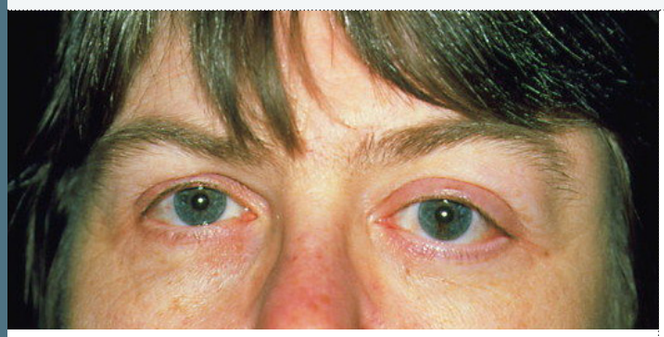
A. CSF cleft
B. Broad dural base
C. Bony reaction
D. All of the above
E. None of the above

Answers

1. C **2. B** **3. D** **4. E** **5. D**

MENINGIOMA

Hani Marcus



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CORE SURGICAL TRAINING IN THE BRITISH ARMY

Captain Henrietta Poon RAMC

Core Surgical Training in the British Army.
Career Focus.

Core Surgery: When did you first get the idea of joining the armed forces?

I decided that I wanted to be an army doctor whilst preparing for my A levels. I wrote to the Royal Army Medical Corps (RAMC) recruitment office at that time and was advised that I should:

1) Obtain a place at medical school

2) Join the Officer Training Corps (OTC) at university, to get a flavour of military life

3) Attend (and be successful at) the medical cadetship interview board as a medical student.

I completed all the above tasks and began a different undergraduate experience from my colleagues. Besides financial support from the Army, I also enjoyed an exceptional elective arranged by the Army Medical Directorate Support Unit (AMD Sp) with Medical Shock Trauma Acute Resuscitation (MedSTAR) in Washington D.C., USA. Closer to home, I was kept busy by the social calendar of the City of Edinburgh Universities' Officer Training Corps (CEUOTC).

Core Surgery: So what happened after graduating from medical school?

After medical school, I completed my foundation training alongside my civilian colleagues in Edinburgh. I then followed a different path: I went on to a two-year programme consisting of the Entry Officer Course (EOC), the Postgraduate Medical Officer Course (PGMO course) and then a posting as a General Duties Medical Officer (GDMO).

Frankly, I was looking forward to a two-year break from the National Health Service and soon found myself reporting to Keogh Barracks to begin. This initial brief phase at Keogh was designed to cover the basics before we arrived at the Royal Military Academy in Sandhurst. We were taught to iron our uniform, basic marching drills and how to recognise rank slides so we would know who to salute.

It was then on to Sandhurst for the four week long EOC. Most Army officers complete a 44 week course at Sandhurst, but the EOC specifically trains lawyers, dentists, doctors, padres and nurses, all of whom join the Army after gaining their professional qualifications.

In a world-renowned academy of leadership, we learned basic infantry skills and attended lectures on British Army doctrine. The course was intense due to the number of topics covered in a short time, and was designed to put us out of our comfort zone; we were tested mentally, physically and emotionally. Not only was it great fun for us, but the seasoned Colour Sergeants instructing us found it most amusing to watch doctors and lawyers digging shell scrapes in the rain, and the padres leading a section attack!

Hours spent "bulling" our shoes to shiny perfection for the passing out parade were not wasted, as we stood proudly in front of the Old College watched by our guests. We managed to march in tune with the band too, which was a vast improvement from our initial "tick-tocking" on the first day!

The next phase was the PGMO course, back at Keogh Barracks for four months. In this, we concentrated on military medicine, to prepare us for our role in our first posting. There was lectured-based teaching on public health, occupational health, tropical medicine, general practice and psychiatry aimed at the military population. We also had practical sessions on major incident management, the various stages of the chain of evacuation and on chemical biological radiological nuclear (CBRN) warfare. Compared to what my friends from medical school were up to at this stage, it was a much more enjoyable day at work playing with big saws cutting into wreckage and treating simulated casualties in full CBRN protection gear. The PGMO course covered the syllabus from the Diploma in Medical Care in Catastrophe (DMCC) and we got to sit the first part of the diploma exam.

On completion of this course we became General Duties Medical Officers (GDMOs), and were dispersed across the UK, some to Germany and some immediately to an operational tour. The six months had been extraordinary not only in terms of personal development, but also due to the formation of lifelong friendships.

CORE SURGICAL TRAINING IN THE BRITISH ARMY

Captain Henrietta Poon RAMC

Core Surgical Training in the British Army.
Career Focus.

Core Surgery: What did your duties as a "General Duties Medical Officer (GDMO)" involve?

I was posted in March 2008 to 4 Medical Regiment as a GDMO. When I arrived, the regiment was in pre-deployment preparation for Exercise Sharp Point, an annual live medical exercise in support of the Kenyan Ministry of Defence vaccination programme. Off to Africa I went. We travelled to the remote areas of Kenya in the back of the "4 tonner" trucks through difficult terrain for 5 weeks. Typically we "set up shop" on the day of arrival in a new area. Primary health care and vaccination clinics were conducted over a few days and many patients walked for miles to see us. Challenges included keeping the vaccines at the optimum temperature in the hot weather, and the number of clinics conducted was limited by fuel and water resupply. As a doctor I often found it frustrating that I could not do as much as I would have liked for many of the patients due to limited facilities: our drug supplies were limited to oral antibiotics, analgesia and vitamins; and no follow up or secondary care capabilities. Nevertheless it was a great opportunity to deliver quality medicine in austere conditions, whilst experiencing the cultures of various Kenyan tribes.

When not on pre-deployment training, my "normal" work day would be in a military medical centre to provide primary health care to the local military population. Other commitments included physical fitness training and teaching Combat Medical Technicians (CMTs) within my unit. There were many opportunities to attend various courses and conferences; as well as participating in adventure training scuba diving trips to exotic destinations.

My last four months as a GDMO were spent on deployment to Herrick 10 Afghanistan. I was the Medical Officer (MO) at a Forward Operating Base (FOB) providing pre-hospital trauma support and primary health care to a population of around 150. I was the Officer-in-Command's adviser to the company's health, mass casualty and casevac plans. My Regimental Aid Post (RAP) consisted of a few small tents forming the trauma bay, primary care area and the isolation ward. I was the only doctor in the base with four CMTs; we worked closely to maintain the RAP and provided medical support on patrols.

My operational tour was probably the best learning experience since qualifying as a doctor; for the primary health care side the main challenge was judging when to make referral to secondary care in the base camp as there were logistical (helicopter!) and manning issues involved. On the pre-hospital trauma side; it was a test of my leadership, organisation, communication skills and team-working abilities. I found the experience of running the RAP put clinical governance into perspective; it was my responsibility to provide continuous training for the CMTs, ensure that equipment and medical supplies were in stock and to identify problems in order to improve clinical care. There was no settling into a "groundhog day" mode - it was essential to remain focused.

It was all very daunting at first when I waved my predecessor off as I realised that I was "it" and was still digesting the detailed handover. Soon I settled into the role and suddenly, it was as if a switch had turned on: everything I had been taught in Sandhurst and Keogh came together. I enjoyed the close camaraderie while out on the ground, and the soldiering skills, I learned on the training grounds of Sandhurst were tested. It was a fantastic finale to my GDMO duties and I was ready to return to the NHS.

Core Surgery: Quite an experience! So what happens now in terms of specialty training?

On the completion of GDMO duties, we enter specialty training two years behind our peers from medical school. Instead we are equipped with a battery of highly-tuned and transferrable skills ranging from emergency trauma care through to teaching experience, leadership skills, discipline, self-reliance. We have also gained a wealth of unique life experiences.

Application is made through the Defence Postgraduate Medical Deanery, and there are currently seven deaneries available for hospital-based specialty training. We can apply to two specialities and list a preference of three deanery locations for our first specialty choice. The selection process is through a central interview by the West Midlands Deanery. The minimal marks set by the selection board have to be achieved, and just like in civilian medicine, there is competition for popular specialties.

CORE SURGICAL TRAINING IN THE BRITISH ARMY

Captain Henrietta Poon RAMC

Surgical training is currently uncoupled in the military and all surgical trainees enter into a generic Core Surgical Training programme. There is then another similar selection process at ST3 level. Once we commence training in a deanery; the location of hospitals and rotations are allocated by that deanery. During the two core surgical training years, we are unlikely to be sent on deployment commitments, allowing a focussed period of training in the UK.

Core Surgery: In a nutshell then, what would you say are the pros and cons of training in the Armed Forces?

The nature of the job is such that the Army's needs inevitably have to come first. Therefore one must remain flexible and might not have as much "freedom" of choice on location or job description compared to our civilian counterparts. There is the potential for conflict with family life, though this remains true for many demanding civilian training programmes, such as surgery, anyway.

However, this training comes with a multitude of adventure training opportunities, unique learning experiences and incredible personal development, as we have discussed already.

Whilst I have been "playing soldier" for the past two years, many of my friends have since progressed to registrar-level posts in their chosen specialties. However, looking back at myself as a doctor fresh out of FY2, I feel that I have matured into a better-rounded person, and my additional training will be an enormous asset in my future career.

Core Surgery: You started out early on with the Armed Forces, but how can trainees interested in joining get more information?

For more information do visit the Army Medical Services website and Army Jobs website:

http://www.army.mod.uk/army-medical-services/ramc/15836.aspx

http://www.armyjobs.mod.uk/jobs/pages/JobDetail.aspx?armyjobid=A0F005&category=

Figure 1: Infantry exercise during EOC

Figure 2: Exercise Sharp Point Kenya

Figure 3: Trauma bay in RAP

Figure 4: Preparing for patrol

SURGERY ABROAD: PLASTIC & RECONSTRUCTIVE SURGERY, GHANA

Suzanne Thomson

Surgery Abroad: Plastic & Reconstructive Surgery, Ghana. Charitable Experience.

One of the fantastic things about a surgical career is the opportunities available to combine your interest in surgery with adventures abroad. Travel broadens the mind and can provide invaluable surgical and life experience.

There are a variety of ways to travel at all stages of your surgical training. These include medical electives and specialist modules as an undergraduate, clinical visits and international conferences, clinical fellowships or working with charitable organisations.

I recently embarked on core surgical training with a plastics theme. My interest in plastic surgery was inspired by my time spent with Canniesburn Plastic Surgery Department as a third year medical student.

As an undergraduate I was fortunate enough to have many overseas travels but was perhaps most touched by my time spent in Africa. True enough, I witnessed abject poverty, tropical illnesses and advanced disease states almost unheard of in the UK but perhaps more importantly, I met friendly, enthusiastic people with great hope for improving their healthcare system. Like many adventurous students, I returned home from my elective frustrated by what little I could offer as an undergraduate and inspired to contribute more in the future. Once back in the UK, I searched online as to what plastic surgical services are available in developing African nations and discovered Plastic and Reconstructive Surgery Africa (recently renamed ReSurge Africa 1). It transpired that I had already worked with some of the surgeons who donate their time to this charity and I contacted them to learn more.

Plastic and Reconstructive Surgery Africa was established in 1992 by Jack Mustarde, a Scottish plastic surgeon visiting Ghana, who saw that there were almost no plastic surgery provisions in the country.

There is, however, a great need for plastic and general surgical services throughout West Africa. There are many endemic and mutilating tropical diseases, poor road networks result in severe trauma and most people rely on gas cookers, resulting in a great number of paediatric and adult burn injuries. With the support from Ghana's President at the time, President Rawlings, Mr Mustarde and colleagues established the countries first plastic surgery services.

Today, 3 plastic surgeons, all of whom received intensive post graduate training in West Africa and Scotland, operate the Accra unit with great success. Surgeons from UK continue to volunteer their time focusing primarily on further surgical training in Ghana and also completing complex surgeries alongside the local consultants and trainees. A second Ghanian plastic surgery centre is established in Kumasi. Lessons learned by the successes of these units are being used as a template for the expansion the project to include other West African countries, like Sierra Leone. The charity's vision is to make Accra a centre of excellence in plastic surgery and the educational lead for West Africa. This is no mean feat and turning these great aspirations into realistic contributions requires commitment, passion and funding.

My Experience

Following late night meetings to discuss trip objectives, being pin-cushioned with a series of immunisations and some last minute packing in between shifts, I was glad to have seven hours of protected downtime on my flight to Ghana. My role was to visit the centre in Accra and collect case studies to provide medical information for the charity's website[1] to raise awareness amongst medical professionals about the plastic surgery unit and the opportunities for involvement.

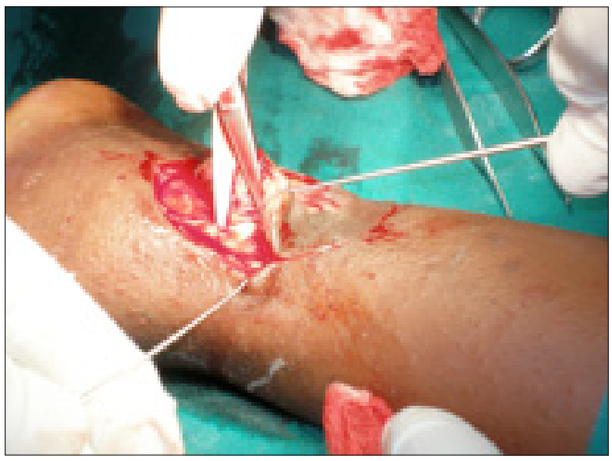
The flight touched down around 10pm and on leaving the air conditioned plane, it was great to be instantly surrounded by the warm West African night air.

SURGERY ABROAD: PLASTIC & RECONSTRUCTIVE SURGERY, GHANA

Suzanne Thomson

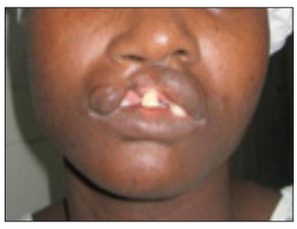
Mr Lucas, an employee of the plastic surgery department in Accra, kindly met the lead consultant of the trip and I at the airport and we travelled in style, in the large patient bus purchased by the plastics unit with funds raised by the charity.

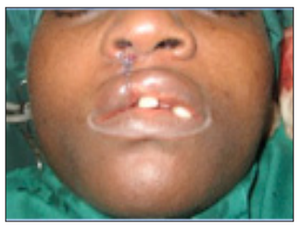
Following orientation to the department, I was introduced to the team. I attended theatre, clinic and teaching ward rounds, where interesting cases were highlighted so I could take a full history and perform a complete examination later. Finding private space to examine patients was tricky as there are many patients per room with few partitions available. I brought consent forms from home and would recommend doing so. Ghana has a more paternalistic medical system where gaining true informed consent is not expected as it is in the UK.



The most common cases encountered are burns and trauma, cleft lip and palate, congenital anomalies, chronic ulceration including several cases of Buruli ulcer and less common but equally devastating Noma disease.

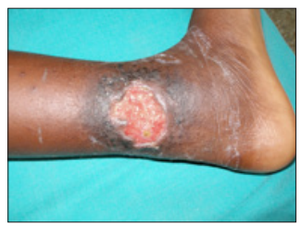
I assisted the local consultants in many cleft lip and palate repair surgeries. Contrary to what we see in the UK clefts often present in late childhood and adulthood, due to a greater numbers of births outside of hospital, lack of awareness of the availability of cleft services and social stigmatism arising from local superstition and resulting in poverty. Lack of funding to make the journey to the hospital and afford the surgery itself is a major contributory factor and the main reason for the delay in presentation of the twenty-four year old female shown in the pre and post-operative pictures above.

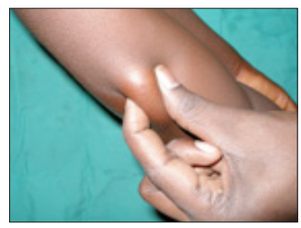




Two sterile burns treatment rooms were recently funded by the charity and busy dressings clinics run here daily. On a whole patients are required to pay for their own dressings and as such they are often not changed as frequently as is recommended.

I was involved in the care of many patients suffering from Buruli ulcer Disease (BUD), an infectious, necrotizing skin disease endemic to Ghana. The responsible organism, Mycobacterium Ulcerans, is an acid-fast mycobacterium of the same genus as the Tuberculus bacilli. As in the majority of cases, I saw, it occurs mostly in rural populations and many do not present to medical services until late in the disease course. The first recognized stage of BUD is the development of a firm subcutaneous nodule, with a central punctum, often only visible on pinching the skin. As the nodule is non-tender presentations at this stage are rare. The active second stage is characterized by formation of an ulcer with an undermined skin edge. Ulcers may be located anywhere on the body, most commonly the arms and legs and is often widespread at first presentation. Patients develop fibrosis and scarring, leading to contracture deformities and functional impairment. Wide local excision and reconstruction of the resultant deformity and release of scar contractures are common procedures in the department.

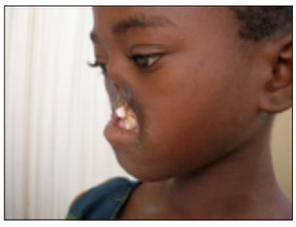


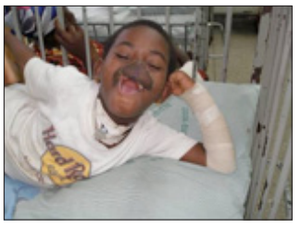


SURGERY ABROAD: PLASTIC & RECONSTRUCTIVE SURGERY, GHANA

Suzanne Thomson

Surgery Abroad: Plastic & Reconstructive Surgery, Ghana. Charitable Experience.





I was touched by the case of the young girl pictured, who presented with advanced Noma disease (cancrum oris). This is a gangrenous disease, affecting the mucous membranes of the face and less commonly genitalia. Her case is very typical in many ways; she was a young child, from a rural village and presented with devastatingly advanced disease. The most common age of presentation is 2 – 6 years. Although the exact causative agent is unknown poverty, malnutrition and immunocompromisation are important contributory factors4. The disease had destroyed the soft tissue of her midface, nasal septum and roof of mouth and left a large midface defect with was reconstructed using a free radial forearm flap. She looks very pleased with her reconstruction!

Whilst being aware of a great need for medical care I also experienced surgical challenges not seen in the UK. On one occasion there was no fresh running water to theatres, but instead of this resulting in emergency theatres being cancelled water was brought from a nearby tank in large plastic basins and poured over our hands to scrub!

Before my departure, I had to try some local cuisine and I was not to be disappointed. Lunch was provided for staff in the theatre kitchen most days and it was here, I was introduced to one of the national dishes; kenke. This is a millet based starch delicacy, which is ground and boiled continually for days on end. Every day fresh millet is added and the mix is kept on heat and semi-fermented. Once ready (15-30 days), it is wrapped in banana leaf and sold in small packages by roadside vendors for one to take home (or to the theatre staff room) and enjoy with a hot red bean sauce!

Seizing every opportunity to travel, when not in hospital, I was lucky enough to enjoy a trip to the beautiful Cape Coast. After learning more about the countries history and a long drive, over bumpy dirt track roads, it was fantastic to fall asleep to the sound of waves breaking around 10m away from the wooden beach banda in which we stayed. I learned more about eco-tourism and supported the local economy on an incredible dugout canoe trip through mangrove forests!

The end of the visit came very quickly. I had a great time with the plastic surgery team in Ghana, who welcomed me and taught me about the surgical management of plastic surgery conditions seen in the UK as well as tropical diseases endemic to Ghana. The warmth shown towards a complete stranger, the enthusiasm to share knowledge and the life changing surgeries being performed daily, often in challenging clinical environments, meant that this trip was not just educational, but also a refreshing and inspiring experience.

SURGERY ABROAD: PLASTIC & RECONSTRUCTIVE SURGERY, GHANA

Suzanne Thomson

How you can get involved – Top Tips:

Get motivated and Find a Reputable Charity

Different people have their own reasons for donating their time and resources to enable surgery in nations where resources are more limited. A consultant I trained under took annual leave to travel back to his home country and help trauma victims following recent natural disaster, and a thrill seeking female surgical trainee, whom I met on my ATLS course, booked her ticket to help with a charitable South African surgical team as soon as she heard this was to be the location of the world cup! It is possible to make a huge difference, particularly in an area you feel passionately about.

No matter what your motivation, it is essential that you invest your time and effort into a worthy charity. Unfortunately there is a great deal of corruption amongst charities both at home and in developing countries. You should check that the charity you are interested in working with is registered and reputable. I was shocked to find that it is acceptable for UK charities to spend 60% of donation on "other costs" with only 40% going into the activity for which the charity was established. I am pleased to say that over 80% of ReSurge Africa's donations go directly to fund education and surgical care in West Africa.

Identify your role

Try to get an idea of what is expected of you before you go. Your role will differ greatly depending on the clinical setting you visit. The plastic surgery unit in Accra is a busy department, successfully run by well trained local surgeons, from whom, I was able to learn a great deal. My role of collecting clinical information and transforming this into ways of communicating the charity's efforts to current and potential supporters was ideal for someone at my level of training. My contribution was meaningful and safe, whilst allowing me to develop my surgical experience and knowledge. It is important not to undertake any clinical duties abroad that you would not feel comfortable and competent to do at home and this ethos is preserved in all reputable charities. Early in your surgical career you can have a limited safe surgical input and often charities are unable to accept offers of help from junior "untrained" doctors. However, you should not be disheartened as early observational visits are possible with some centres and provide excellent opportunities for your education whilst gaining an understanding of how you can help fundraise or plan ways to become more clinically involved in the future. Other contributions at this stage of your career include working with established research teams or teaching medical students and junior doctors. Research prior to going away as to your units' daily activities and scheduled clinics or theatre sessions will allow you to organise your contributions efficiently.

If you are lucky enough to find yourself preparing to travel abroad to volunteer in a surgical environment there are several things to think about before the adventure begins.

Do your homework

Learn about the country you are going to, buy a travel guide or look online. Find out a bit about the economy, and start to learn about how it influences healthcare.

More information about global economy and healthcare in the country you are going to visit can be found on the BMJ elective pack site[2]. It provides a useful overview of the role of major players (world bank and international monetary fund, UN, WHO, NGOs) in world health and development.

Be Safe

You're only useful at home and abroad whilst you are well. Vaccination schedules need to be started weeks (or months) before departure and can be costly. Some are essential for travel, for example, Ghana, like many other countries requires evidence of Yellow Fever immunization at border control. Others, like anti-malarials are recommended.

The FCO website[3] offers up-to-date information on current affairs and travel safety. I carried anti-retro-virals in my pocket, as these should be taken within one hour of exposure to be most effective. You can get these from your travel clinic. The major medical bodies offer insurance, again check on the FCO website. If the country is deemed a "recommended no travel" zone many policies will be void. Find out, if your country of travel requires a visa and where is the nearest embassy.

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Travel Preparation

When considering what to pack appropriate work and travel clothes and checking online weather guides, goes without saying. A head torch often comes in handy! I would recommend taking your camera and laptop, one of the great things about internet communication is global accessibility! If you are there for any length of time, pack an old, network unlocked phone as purchasing a local simcard proves much more economical. It may be worth choosing your airline company based on baggage allowance, some larger airlines allow two items as standard on long hall flights, allowing a bag for you and one to carry items useful for your project at the other end.

The flight is a great opportunity to relax, read or catch up on sleep missed due to hectic on-calls! When the warm air welcomes you at your new destination it is nice to know you have some local currency in your pocket and travel arrangements to your accommodation.

Once you are there get involved, try new things and grab every opportunity to work hard and explore!

When I came back, I was tired but mostly refreshed and refocused and began work to convert what I have learned into a medical section for the ReSurge website. Now, back to juggling the many aspects of a busy core surgical trainee job (which, despite EWTD, can at times be gruelling) I find I can refer back to experiences in Ghana for motivation, to answer surgical questions, and to recall a story of a great adventure. Both travel and surgery deliver experiences, broaden the mind and allow the sharing of ideas. Sr. Oliver Wendell Holmes wisely said and my mum wisely quotes; "A mind stretched by a new idea can never go back to its original dimension".

If you would like any further information or to support the great surgical work ReSurge Africa is doing please do not hesitate to visit the website or contact us on details provided.

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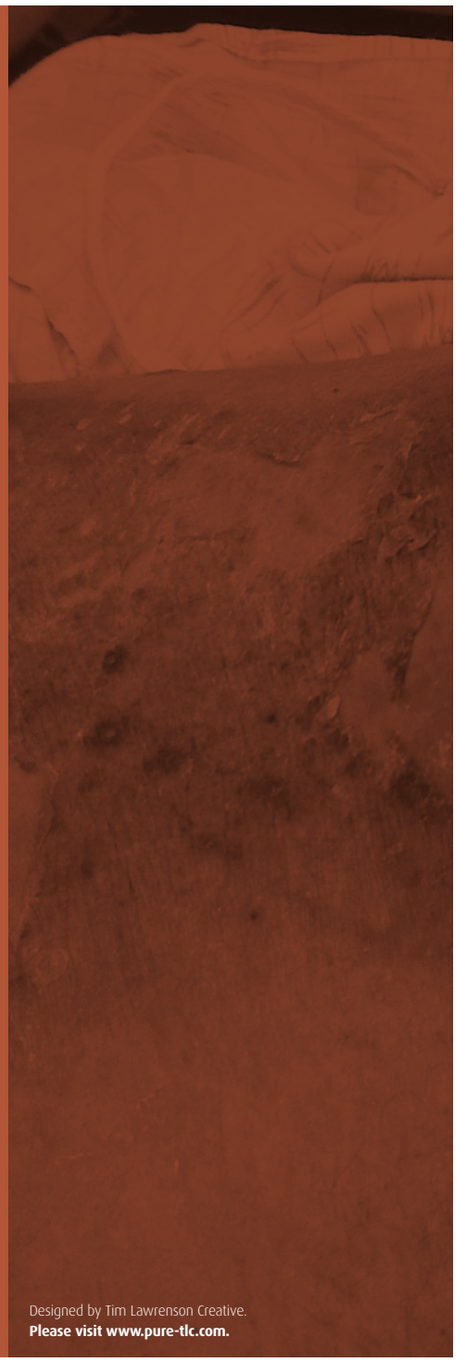

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