A Clinical Approach To Common Surgical Scenarios

A Handbook for students and Junior Doctors

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Common clinical problems for surgeons

INTRODUCTION

Most junior doctors in South Africa and in many developing countries are expected to manage surgical patients in stressful, compromised circumstances, with little senior supervision and guidance. This is the reality. It is confronting and disheartening. Surgery is a hard, unpredictable job, and the feeling of helpless isolation, when surrounded by acutely ill patients is one that many of us are familiar with or remember vividly.

The purpose of this book is to provide a guide to the evaluation of common surgical problems- particularly those that present at odd hours, and test diagnostic and troubleshooting skills when there is no-one else to help or to ask for advice, and special investigations and fancy tests are not available.

So, first of all, you must always apply your mind to what the clinical diagnosis may be. To do this, you must be inquisitive, interested, persistent and driven to make a diagnosis and to resolve your patient's problem- a half-baked clinical assessment followed by a battery of tests and scans is a poor way to practice, may be frankly dangerous, and is for the intellectually destitute.

To be a competent surgeon you have to be a good, thorough diagnostician: this can only be done by taking a ***comprehensive, insightful history, followed by a proper clinical examination of the patient- nothing can replace the fundamental value of this***.

A proper clinical evaluation is always driven by thinking about what the likely differential diagnosis is for any given complaint- thus your working algorithm is:

- **What is the core complaint/ symptom and what could be causing this**?
    - what other symptoms are associated with this?
    - what are the precipitating factors/ predisposing conditions?
    - Are there other symptoms on systemic enquiry
    - How fit is this patient, if we need to operate?

- Do a proper clinical examination

- Formulate a working differential diagnosis
    - what are the most common diagnoses?
    - what is a rare diagnosis that you don't want to miss?

- Request tests (or not!) to confirm or disprove your diagnosis, and some tests to evaluate the patient's fitness for surgery, if this is necessary

- Treat the illness that you have diagnosed

We have chosen common clinical problems that almost all junior doctors will face when working in surgery. Most of them are surgical emergencies, but some will present to you in an outpatient clinic, and others in the ward.

Some topics lend themselves to some therapeutic discussion, whilst others are too broad to enter into details; there are many excellent, comprehensive surgical textbooks and online resources that will help you in these situations. Use this book in conjunction with these resources, specifically with regards to understanding the pathophysiological processes, and the many varied therapeutic processes that follow.

Each chapter is deliberately short and consists of our opinion about key differential diagnoses, evaluation algorithms, with some selected images, and hints and suggestions.

We emphasize what are the most likely diagnoses, and which rare ones are dangerous to miss, rather than give you an exhaustive list of weird possibilities.

In cases of uncertainty, it is helpful to use a systematic approach to the possibilities, using one of the two classical "Surgical Sieves"- these will give you a comprehensive list, but it is your local knowledge and experience that will guide you which of these are the most likely causes of the complaints facing you.

THE AETIOLOGICAL SIEVE

- Congenital
- Acquired
  - Traumatic
  - Inflammatory (physical, chemical, infective)
  - Neoplastic (benign or malignant, primary or secondary)
  - Circulatory / Vascular
  - Autoimmune
  - Nutritional / Metabolic
  - Endocrine
  - Drugs / Iatrogenic
  - Degenerative
  - Psychosomatic

THE ANATOMICAL SIEVE

This is helpful to consider pathologies given the anatomical site of the symptoms / and or clinical signs; i.e. an abdominal “lump” may arise from:

- Skin
- Subcutaneous tissues
- Muscular
- Adjacent joints
- Underlying visceral organs
- Lymphatic structures
- Vascular structures
- Bones

Our aim is not to produce a comprehensive textbook of surgery. We have noticed there is a paucity of ***clinically driven*** books and guidelines of surgical diagnoses- and we want to fill this gap, and specifically give it South African, and developing world relevance. If you are a medical student, these topics will guide you to put surgical conditions in context- but this is just the tip of iceberg knowledge

CHAPTER 1. Doctor, I can't swallow! An approach to dysphagia

Eugenio Panieri

Context: Emergency Unit or OPD

Introduction

Patients who can't swallow food will usually be able to accurately describe where they feel the level of obstruction is: either in the oro-pharynx or somewhere along the length of the oesophagus. Oro-pharyngeal conditions cause difficulty to initiate swallowing, whereas in true oesophageal dysphagia patients describe a normal swallowing reflex, and then will point to where the food seems to obstruct.

It is very important to ask if the dysphagia is constant and progressive or episodic, as the latter is more suggestive of motility disorders. Also enquire about pain on swallowing (odynophagia) which will be more suggestive of an inflammatory condition, such as esophagitis.

Occasionally patients with long-standing dysmotility may develop a "mega-oesophagus" that is able to collect a large volume of food- on regurgitation it may be similar to the contents of gastric outlet obstruction.

On examination pay specific attention to signs of dehydration, weight loss, anaemia, and supra-clavicular adenopathy. Look for thyroid and other neck masses, and do a neurological examination to rule out a bulbar or pseudobulbar palsy. Chest infections are common, from aspiration or occasionally broncho-oesophageal fistulae.

Abdominal examination is usually unremarkable.

Differential diagnosis

Oropharyngeal *These are primarily ENT or neurological conditions- they will seldom present de novo to a surgical unit, as the diagnosis is obvious in most cases*	
Common Causes	**Unusual**
Iatrogenic strictures post-radiotherapy or corrosives Neurological disorders • Bulbar/ pseudobulbar palsy • MS • Parkinsonism • RLN palsy	**In the lumen** Oesophagal webs Oropharyngeal tumours **In the wall** Zenker's diverticulum **Dysmotility** Globus hystericus &myopathies
Oesophageal *The majority of cases in SA adults will be oesophagal carcinomas.*	
Common Causes (>90%)	**Unusual**
Carcinoma • Squamous carcinoma (proximal / mid 1/3) • Adenocarcinoma (distal 1/3) • carcinoma of OJ junction • proximal gastric carcinoma GERD stricture Strictures following corrosive ingestion	**In the lumen** Food bolus or foreign body obstruction Oesophagal webs **In the wall** Other neoplasm (GIST/ Kaposi) **Extrinsic** Mediastinal adenopathy (TB/ lymphoma) Retrosternal goitre Aneurysm of the aortic arch **Dysmotility** Achalasia & other oesophagal dysmotility syndromes

Evaluation priorities

How bad is this?

- Some patients are overtly cachectic and need admission and urgent investigations. This is typical of advanced squamous carcinoma of the oesophagus. Most other cases can be managed and investigated as an outpatient.
- rehydrate the patient and correct electrolyte derangements.

Dysphagia grading

1	Complains of dysphagia, but can maintain a normal diet
2	Requires liquids with meals
3	Eats semisolids
4	Liquids only
5	Can swallow saliva only
6	Complete dysphagia

What is the cause?

Oesophageal carcinoma	Progressive dysphagia, marked LOW, cachectic
GERD stricture	History of reflux precedes the onset of dysphagia
Achalasia	Intermittent dysphagia to both liquids and solids
Corrosive stricture	Psychiatric history, recent suicide attempt with ingestion of corrosives, previous dilatations

What other investigations must I consider?

True oesophageal dysphagia	Oropharyngeal dysphagia
The key investigation is an ***upper GI endoscopy***. This will confirm the diagnosis and differentiate between oesophagal carcinoma and a reflux stricture. A barium swallow is also helpful Motility studies must be done in suspected achalasia	Nasopharyngeal endoscopy Dynamic videofluoroscopy

Real problem scenarios!

The endoscopy can't see a mucosal lesion, there is nothing to biopsy!

- Book a CT scan to see if there is compression from mediastinal pathology

The oesophageal lesion looks like cancer, but the biopsy is negative!

- Discuss with your consultant
- How many biopsies were taken (a minimum of 4 must be taken in each case!)
- Consider a repeat endoscopy and re-biopsy
- Do a barium swallow

When must we intervene?

- Most cases are managed endoscopically, obviously depending on the cause.
- Squamous carcinomas are almost always irresectable, and patients are palliated by either inserting a stent across the obstructing lesion or by radiotherapy
- Adenocarcinomas are more likely to be considered for curative treatment and a combined senior review of their cases must be done before definitive interventions are planned.
- GERD and corrosive strictures are usually managed by serial oesophagal dilatations.

CHAPTER 2. Doctor, I feel an abdominal discomfort and heartburn! An approach to dyspepsia

Eugenio Panieri

Context: OPD

Introduction

Dyspepsia is a broad, generic term used to encompass symptoms the patient and the doctor interpret as originating from the foregut, i.e. typically discomfort centred in the epigastrium, persisting for at least one month.

It is a symptom that usually is associated with functional or benign upper GI conditions, but that can also be the earliest presentation of lethal upper GI cancers- herein is the diagnostic challenge.

This chapter excludes patients who experience severe, debilitating pain requiring hospital evaluation- these will be considered in a separate chapter. In real life, there is often an overlap ("a grey zone") between dyspepsia and severe epigastric pain- your job as a doctor is always to consider all possibilities and work it out!

It is important to ask if the dyspepsia is constant and progressive or episodic, as the latter is more suggestive of functional disorders. Try to elicit from the patient is the symptom is predominantly "pain" (typically caused by peptic ulceration), "heartburn" (strongly suggestive of GERD) or "bloating and nausea" (associated with functional GIT disorders, drug-related side effects, or autonomic neuropathy in diabetic patients). In practice, you will notice that there is significant heterogeneity in symptomatology, and patients will often describe sensations that may overlap in each of these categories!

Ask specifically about the use of known GIT irritants, such as smoking, alcohol intake, and recreational and prescribed drugs. It is also essential to take a detailed dietary history and to accurately document weight loss and any change in bowel habit.

On examination pay specific attention to signs of dehydration, weight loss, anaemia, jaundice, and supra-clavicular adenopathy. Patients with an underlying malignancy may have evidence of muscle wasting, loss of subcutaneous fat, and peripheral oedema due to weight loss. Abdominal examination is usually unremarkable, but you may elicit epigastric tenderness or a palpable abdominal mass. Ascites may indicate the presence of peritoneal carcinomatosis.

Most patients (75%) with dyspepsia will not display any demonstrable pathology. They are categorised as "functional dyspepsia" or "non- ulcer dyspesia" (NUD).

The commonest organic pathology noted will be peptic ulceration and GERD. Gastric and pancreatic cancer will account for less than 1% of all cases.

Differential diagnosis

Epigastric Pain- dyspepsia		
Common Causes	***Don't want to miss***	***Unusual***
Peptic ulcer (DU or GU) Gastritis/ duodenitis Biliary colic Medications	Gastric cancer Pancreas cancer	Abdominal wall pain Epigastric hernia Ischemic bowel disease,
Heartburn – dyspepsia		
Common Causes	***Don't want to miss***	***Unusual***
GERD medications	Oesophagal cancer	Achalasia IHD
Bloating / nausea/ abdominal distention- dyspepsia		
Common Causes	***Don't want to miss***	***Unusual***
Functional dyspepsia Diabetic autonomic neuropathy “gastroparesis” medications	Peritoneal carcinomatosis Ovarian neoplasm	Hypercalcaemia Thyroid disorders Intestinal parasites Crohns disease Coeliac disease

Evaluation priorities

The majority of cases can be managed symptomatically, without any investigations. The use of invasive investigations is limited to new-onset dyspepsia in patients over the age of 60, and in those with **convincing alarm symptoms**. Most should be investigated as outpatients.

Look for alarm symptoms suggestive of GIT malignancy, and investigate if you have a clinical suspicion. The best initial investigation is an upper gastrointestinal endoscopy.

ALARM SYMPTOMS	Unintentional weight loss > 5% BMI Progressive dysphagia Odynophagia Unexplained iron deficiency anaemia Persistent vomiting Palpable mass or adenopathy Family history of GIT malignancy

What other investigations must I consider? Be selective in the investigations, and use common sense.

Test for H pylori	Stool antigen test or breath test
Could this be a carcinoma	Endoscopy and FBC CT
Could this be biliary pathology	US and LFT

CHAPTER 3. Doctor, I have lost so much weight! I am sure it must be cancer! An approach to unintentional weight loss

Eugenio Panieri & Adam Boutall

Context: OPD

Introduction

Unintentional weight loss is quite common, and patients and their family will often seek medical opinions about the cause. The key concern for most is the possibility that an occult malignancy is responsible for this condition.

Different terms are used in textbooks and the literature, although clinicians often use them interchangeably.

Unintentional weight loss= weight loss > 5% body weight, over 6 months or more
Cachexia= weight loss due to MUSCLE loss
Sarcopenia= syndrome characterized by loss of muscle mass, strength, and performance

In reality, progressive weight loss is primarily a clinical marker of frailty; it is very common in patients over the age of 65 and is seldom caused by a single curable condition, however it almost always warrants investigation

In at least 30% of patients, no diagnosis is ever reached. Similarly, in a country where extreme poverty is common, malnutrition (inadequate access to food), inextricably woven with HIV and recurrent TB, is an extremely common cause of weight loss.

There are many potential causes, and most are unrelated to surgery. The role of the surgeon in this context is to be aware of the broad picture and to guide the diagnostics in cases that may relate to gastrointestinal pathology, or when tissue diagnosis require invasive interventions.

A truly occult cancer is an uncommon cause of cachexia, in the absence of other overt symptoms or signs.

Cause	Common conditions	Unusual/ comments
Malignancy 15-37%	Lung, upper GI cancer	Many cancers DO NOT cause cachexia
GIT disorders 10-20%	Peptic ulcer, IBD	Chronic pancreatitis, coeliac disease
Psychiatry 13-25%	Severe depression, anorexia	
Endocrine	Diabetes, thyrotoxicosis	Addisons, hyperparathyroidism
Neurology	Stroke, dementia, Parkinson's	
Chronic infection	TB, HIV, hepatitis	Parasitic, fungal infections
Organ failure	Cardiac cachexia, CRF, COPD	
Autoimmune	RA, SLE	Other vasculitis
Drugs	Alcohol, cocaine, TIK, tobacco	

Given the broad differential diagnosis, there is no one-size-fits-all approach, and as always a thorough clinical review is essential to guide further management and investigations.

This is where the doctor should go back to the basics of clinical methods: and take a ***comprehensive history***, systematic enquiry, followed by a ***full physical examination***, keeping in mind the common causes mentioned above. It is absolutely vital that the patient is weighed at the first and subsequent appointments. Sustained and documented weight loss is a worrying symptom which will almost always need special investigations. It is unusual that one will be able to reassure the patient that the weight loss is not serious without fully investigating the patient.

Evaluation priorities

What is the diagnosis?

In the absence of an overt clinical diagnosis, it is reasonable to do a broad range of investigations to identify the commonest causes.

Urine	Urinalysis, glucose
Bloods	FBC, electrolytes, LFTs, calcium, CRP
Endocrine	Glucose, HbA1c, TFT
GIT	Stool haemoccult
Serology	HIV, Hepatitis
Radiology	CXR

Further investigations will be driven by any abnormality picked up in the above panel of tests.

Should they all be COMPLETELY NORMAL, and patients is without any clear symptoms to guide you, it is reasonable to hold off further tests, and review the case in 6-8 weeks time.

I am not quite sure what is going on, and I need more information

Be selective in the investigations, and use common sense instead.

The investigations below are *occasionally* helpful.

Test	Issues to consider
USS	Useful as a cheap screening test especially in a thin patient
CT scan	If suspecting pancreatic carcinoma or liver metastases
Upper GI endoscopy	In cases of suspected gastric or oesophageal cancer
Colonoscopy	Has a very low yield, use only if symptoms or clinical context suggest lower GI pathology or all other tests have proven to be normal

CHAPTER 4. Doctor, I feel a lump in my abdomen! An approach to the abdominal mass

Eugenio Panieri

Context: OPD/ casualty

Introduction

Some patients present with an abdominal lump. Given the thickness of the abdominal wall and musculature, this finding is often unclear, and sometimes it is not born out by your clinical examination.

If real, it often is a sign of serious pathology that has major consequences for the patient.

Like all masses, you need to ask the usual "lump related" questions:

Where is it?	The clinical implications and differential diagnosis are very different depending on where it is!
When and how did you first notice the lump?	Was it noticed incidentally, or did related symptoms point it out? When was it first noticed?
How has the lump changed since you first noticed it?	Has it got bigger, smaller, stayed the same size or has it come and gone? Has it changed its appearance and consistency?
What symptoms does it cause you?	Is it painful? Does it cause any other symptoms? The key is to interrogate the GIT, and urogenital systems.
Have you got any more/had it before	If the patient has many lumps, are they the same? If the patient has had this before, what happened to it the last time, and what did the doctor say it was?
What do you think it is?	Most patients worry that this could be cancer. You have to aware of the patient's concerns if you want to be able to reassure them

There is no substitute for a sound approach and thorough clinical evaluation of such cases. You have to take time, ask a comprehensive set of questions about the presenting symptoms, associated complaints, and a systematic enquiry. Always examine the patient properly. Do not throw your hands up in the air, and "just do bloods and order a CT"; apply your mind and **MAKE A CLINICAL DIAGNOSIS**! Be inquisitive, and take pride in the clinical assessment of each case.

ASK ABOUT PAIN THOROUGHLY: define the presenting complaint

Pain	
Location and radiation	*Where is it, and where does it radiate to?* RUQ- liver or biliary tree Shoulder tip- diaphragmatic irritation Back- retroperitoneal pathology Groin-renal or iliopsoas disease RIF- appendix/ ileocaecal disease LIF- colon
Temporal elements	*The onset, frequency, and duration of the pain are helpful features* Neoplasms = gradual and persistent Perforation with localized abscess = sudden onset & high intensity
Severity	*The severity of the pain generally is related to the severity of the disorder, especially if acute in onset* High intensity= advanced malignancy/ abscess
Precipitants or ameliorating factors	*Identify what precipitates or improves the pain* pancreatitis = strong association with alcohol intoxication

GIT symptoms	Nausea, vomiting= gastric outlet obstruction due to gastric cancer? Constipation= colorectal malignancy Jaundice = HPB malignancy or chronic pancreatitis
Genitourinary symptoms	Hematuria= renal cell carcinoma
Gynaecological history	Menstrual history (LMP, previous period, cycle length) – make sure the patient is ***NOT PREGNANT*** dyspareunia or dysmenorrhea- possible uterine or ovarian neoplasms
Constitutional symptoms	Fevers, rigors= peritonitis, UTI, cholangitis Fatigue, weight loss, and anorexia =malignancy, TB, systemic illnesses, inflammatory bowel disease

TAKE A COMPREHENSIVE HISTORY: this allows you to consider other causes, and contextualise the patient's fitness for intervention

Cardio-respiratory symptoms	*Does the patient have co-morbidities?* cough, shortness of breath, orthopnea, exertional dyspnea, angina Consider AAA in patients with CVS co-morbidity
Past medical history	Previous abdominal surgery = ? bowel obstruction or recurrent cancer Recent trauma= ? traumatic pancreatitis & pseudocyst HIV+ve= abdominal tuberculosis Previous malignancy= cancer recurrence/ obstruction?
Precipitants & other aetiological factors	Alcohol = acute or chronic pancreatitis? Recent blunt or penetrating trauma= delayed bowel perforation, pancreatitis, diaphragmatic herniae, liver haematoma, false aneurysm

CLINICAL EXAMINATION

General examination	Pyrexia= peritonitis, TB, UTI, PID Anaemia= malignancy , chronic disorders, AAA Jaundice= biliary obstruction Peripheral adenopathy= malignancy
Abdominal examination	**Inspect**- for scars, herniae, masses, distention (*examine the groins & scrotum- remember to exclude testicular tumours!)* **Percuss**- Tympany = distended bowel Dullness = mass/ organomegaly Shifting dullness = ascites **Palpation**- examine all abdominal sites BEFORE feeling the alleged mass. Decide if you can "really" feel it or if it just a vague impression. If you can feel it, decide if you think it is easily mobile, or fixed? These are good proxies for "resectability". *Define size, shape, consistency, tenderness, mobility, pulsation* **Auscultation**- Bruit or murmur= AAA, renal artery aneurysm
Rectal and pelvic examination	*patients with an abdominal mass must have a rectal examination*. Stool bolus= Fecal impaction & obstruction in older adults Tender PR = pelvic abscess Blood PR= colorectal malignancy *All women must have a pelvic examination* Is there a uterine or ovarian mass?

Differential diagnosis: There are multiple diagnoses to consider, and unless you use a structured approach the clinical scenarios can feel overwhelming.

It is practical to consider a diagnostic algorithm that starts with a broad range of conditions and narrows down to the ones most pertinent to a surgical unit.

An old fashioned but helpful pneumonic is: "***remember the 6 F's":*** some of these are easily excluded after a clinical examination.

Causes of an abdominal mass	Fat, fetus, fibroids, fluid (ascites or urine), flatus, faeces, fatal tumour

To be more comprehensive to differentiate the various causes of an abdominal mass, decide on which quadrant the mass is & consider the anatomical structures in that region.

Right upper quadrant mass	
Common Causes	***Clinical features***
Liver mass	Many possible pathologies- commonest are an amoebic abscess or liver tumours.
Palpable gallbladder	If painless & obstructive jaundice= Courvoiser's law= ?HPB malignancy If fever+RUQ pain= ?gall bladder empyema
Rare causes	adrenal neoplasm/ renal neoplasm/ advanced colonic neoplasm

Epigastric & central abdominal mass	
Common Causes	***Clinical features***
Pancreatitis pseudocyst	Either as a complication of severe acute pancreatitis or in chronic pancreatitis, associated with persistent upper abdominal pain radiating to the back.
Gastric mass	Either advanced gastric carcinoma or GIST.
AAA	Pulsatile central mass
Rare causes	pancreatic malignancy/ retroperitoneal adenopathy/ retroperitoneal sarcoma/ paraganglioma

Left upper quadrant mass *This is the **least common** location; the aetiology overlaps significantly with the common causes of an epigastric mass*	
Rarer Causes	***Clinical features***
Splenomegaly	Associated with a variety of underlying conditions (eg, hypercoagulable state, atrial fibrillation, and splenomegaly). Commonly presents with pain radiating to the tip of the shoulder, and sympathetic pleural effusion
Splenic abscess	Associated with fever and LUQ tenderness may be a complication of splenic infarction.

Lower abdominal mass	
Common Causes	***Clinical features***
Appendix abscess	Right lower quadrant pain, anorexia, nausea, and vomiting. Low-grade pyrexia and localised peritonism.
Diverticulitis	Older patient. Pain usually constant in the left iliac fossa, and present for several days prior to presentation. May have associated nausea and vomiting.
Ovarian neoplasm	Often painless. no GI symptoms
Colon carcinoma	Change of bowel habit, anaemia
Rare causes	Crohns disease, TB enteritis, endometriosis, iliopsoas abscess, intussusception

At any site, remember that masses can also arise from the abdominal wall:

Abdominal wall mass	
Common Causes	***Clinical features***
Incarcerated hernia	Characteristic site (umbilical/ epigastric/ groin) or at the site of previous surgery.
Rare causes	Abdominal wall abscess, rectus sheath haematoma, desmoid tumour, sarcoma

Evaluation priorities

What is the diagnosis?

Do baseline tests and plain imaging

Check urine, pregnancy test, CXR, U&E, LFT, lipase, tumour markers

You will almost ***always order some form of cross-sectional abdominal imaging*** to confirm your clinical findings, and/or to reassure the patient if you are uncertain.

Commonly used investigations

Test	Ideal context	Issues to consider
US	Thin patient, good in biliary and gynae pathology	Operator dependent, but widely available and relatively cheap
CT	Best for obese patients, or suspected retroperitoneal or pancreatic pathology	***By far the best investigation*** but it is expensive, uses IV contrast, and is not always available
MRI	Adds extra information in some pancreatic or liver cases	Very expensive, least availability

What other investigations must I consider?

With a solid lesion, it is important to obtain tissue for histological diagnosis. This is usually achieved by a US or CT guided core biopsy.

Bear in mind that some lesions should NOT be biopsied: resectable liver tumours, highly vascular lesions, functional paragangliomas. To be sure, always discuss the decision to biopsy with senior surgeons and radiologists.

If the imaging suggests an abscess, the next step is usually percutaneous drainage.

The investigations below are *occasionally* helpful, and their role is strongly guided by the original CT or US report.

Test	Ideal context	Issues to consider
Contrast study	Can demonstrate obstructions or tumours arising from the GIT, especially from the oesophagus and stomach	Largely replaced by CT scans with either oral or rectal contrast.
endoscopy	If suspecting a gastric or colonic neoplasm	Widely available allows for histological diagnosis
Laparoscopy	Excellent to differentiate TB or metastatic disease	Commits patient to surgery uses theatre resources, requires surgical expertise
Angiography	Vascular cases with occult bleeding or false aneurysm	Requires very specific endovascular skills

SHOULD I OPERATE OR NOT?

The decision to intervene surgically is the most significant of all the issues and must be made only after all the investigations are complete and a confident diagnosis is made.

It is extremely unusual for any of the causes of an abdominal mass to require immediate surgery (with the exception of a leaking aortic aneurysm, or even less common vascular problems).

Resist the temptation to perform a laparotomy to “just have a look”.

An intra-abdominal mass procedure needs senior presence and decision making. It is almost always a major “elective” operation.

CHAPTER 5. Doctor, my eyes are yellow! An approach to obstructive jaundice

Eugenio Panieri & Marc Bernon

Context: casualty/ OPD

Introduction

Patients with obstructive jaundice are usually admitted to the hospital. They are vulnerable to sepsis, dehydration, and pose complex diagnostic dilemmas that need to be untangled. They are best admitted and fast-tracked for investigation.

Management depends on the cause of jaundice. In practice, pre-hepatic and hepatic causes of jaundice are managed by a medical team, and the surgical teams take responsibility for the patients with "post hepatic", cholestatic jaundice. Biliary obstruction is the aetiology in approximately 30% of all patients presenting with jaundice.

Clinical Approach

Try to decide if jaundice is a brand new symptom, or if it reflects a progression of long-standing disease.

ASK ABOUT JAUNDICE THOROUGHLY: *define the presenting complaint*

Temporal elements	*The onset and duration of jaundice are essential* Is this a gradual and progressive symptom? = Neoplastic cause Does jaundice fluctuate, and is of short duration =? biliary stones
Associated symptoms	*Is there pain?* Severe intermittent pain & rigors= cholangitis, stones Painless= early neoplasm Severe persistent pain (often felt in the lower back) and LOW= malignancy *Pruritus*- this has little relation to the cause of jaundice, but it is a symptom that needs intervention for palliation *Is the gut function normal?* Pale stool and dark urine are characteristic of cholestasis, Steatorrhoea may suggest chronic pancreatitis nausea and vomiting are associated with either hepatitis or early duodenal /gastric outlet obstruction
Precipitants or aetiological factors	*Ask about the use of medications, herbal medications, dietary supplements, and recreational drugs* ? any hepatitis risk factors (e.g., travel, possible IV drugs exposure) Exposure to hepatotoxic substances, especially alcohol History of inherited disorders, including liver diseases & haemolytic disorders HIV status ***NB- history of abdominal operations, including gallbladder surgery***

CLINICAL EXAMINATION

General examination	*Jaundice is the dominant sign- it is typically noted in the sclerae and confirmed by a yellow tinge in the frenulum of the tongue* Pyrexia= cholangitis, sepsis, hepatitis Anaemia= malignancy , malnutrition Dehydration/malnutrition= malignancy, sepsis Peripheral adenopathy= malignancy Looks for signs of pruritus, and *features of chronic liver failure* such as spider naevi, bruising, gynecomastia, testicular atrophy, oedema, palmar erythema, Dupuytren's contracture, hepatic fetor, flap tremor, hepatic enchephalopathy Nutritional deficiencies are common in chronic alcoholics (pellagra/ Wernicke's/ peripheral neuropathy)
Abdominal examination	Courvoisier sign (a palpable non-tender gallbladder, caused by obstruction distal to the take-off of the cystic duct by malignancy) Signs of chronic liver failure/portal hypertension such as ascites, distended abdominal wall veins, splenomegaly A palpable mass and ascites may be a sign of advanced malignancy look for scars of previous operations. A laparoscopic incision can be easily missed! Tenderness in the right upper quadrant
Rectal	Blood PR= malena may be due to bleeding oesophageal varices, bright red blood may be due to haemorrhoids associated with portal hypertension

Causes of jaundice

	Unconjugated hyperbilirubinaemia	Mixed hyperbilirubinaemia	Conjugated hyperbilirubinaemia
Common causes	Haemolysis Extravasation of blood into the tissue Stress situations (eg sepsis)	Viral/ alcoholic hepatitis Non-alcoholic steatohepatitis Drugs and toxins Cirrhosis	**Biliary obstruction** *(gallstones, pancreatic or biliary malignancy, chronic pancreatitis*) typically managed by surgical teams
Rare causes	Dyserythropoiesis Impaired hepatic bilirubin uptake Impaired bilirubin conjugation (Gilbert syndrome)	Ischemic hepatitis, Liver infiltration, Inherited disorders (e.g., Dubin-Johnson syndrome, Rotor syndrome), TPN, Postoperative jaundice	**Biliary obstruction** ***Iatrogenic stricture,*** sclerosing cholangitis, hilar adenopathy, HIV cholangiopathy, choledochal cyst **Cholestasis** Severe sepsis, Primary biliary cirrhosis, Viral, Drugs, progressive familial intrahepatic cholestasis, Intrahepatic cholestasis of pregnancy

Evaluation priorities

How sick is the patient? Do I need to start a resuscitation protocol? *(Needed in cases of cholangitis, or severe pancreatitis)*	Hb, blood gas, lactate, U&E, WBC, blood culture Start IV fluid rehydration, IV antibiotics, Vit K
What is the diagnosis? *exclude "medical causes" of jaundice?*	Check urine Serum U&E, LFT's, lipase, hepatitis serology, AFP CXR Abdominal US

Differential diagnosis: The three key steps are:

	Diagnostic steps	Typical findings of biliary obstruction
1	Is jaundice cholestatic? (Or is it mixed or unconjugated?)	Total bilirubin elevated, >70% Conjugated transaminases mildly raised or normal ALP and GGT markedly elevated
2	Differentiate medical causes of cholestatic jaundice" (typically hepatic diseases), from biliary obstruction	US shows biliary dilatation (Intra/extrahepatic) *US is very accurate at making this distinction* *Normal CBD <7mm*
3	Differentiate "benign" obstructive jaundice (typically caused by biliary calculi), from "malignant" obstructive jaundice (most commonly caused by carcinoma of the head of the pancreas)	Visible gallstones, shrunken gall bladder, dilated CBD= choledocholithiasis Distended gall bladder, dilated CBD, no gallstones = malignant biliary obstruction

The patient has unequivocal biliary obstruction- what next?

Common causes	Clinical clues	Investigations
Choledocholithiasis	*Short history, may be relapsing, associated with rigors of cholangitis* *No loss of weight, often obese* *Intermittent severe pain common*	*Bilirubin moderate to high* *WBC often raised* *US – galls stones visible in CBD & in gall bladder*
Periampullary carcinomas (*HOP carcinoma, distal cholangio, ampullary carcinoma)*	*Loss of weight, progressive jaundice* *Painless unless advanced disease* *Courvoisier's law- palpable gall bladder*	*Bilirubin high to very high* *WBC normal may be anaemic* *US – NO galls stones visible, Intra and extrahepatic biliary dilatation & gall bladder* *May have liver mets and ascites* *HOP mass difficult to see on US*
Chronic pancreatitis	*Loss of weight, progressive jaundice* *Recurrent pain due to chronic pancreatitis may have steatorrhea* *Courvoisier's law- palpable gall bladder+*	*Bilirubin high to very high* *WBC normal, may be anaemic* *US – NO galls stones visible, Intra and extrahepatic biliary dilatation & gall bladder, pseudocyst in HOP visible* *HOP mass may be difficult to differentiate from malignancy*
Uncommon causes		
	In the lumen? In the wall? Outside the wall?	Ascaris infestation blocked stent HIV cholangiopathy/ iatrogenic stricture/Klatskin's/ adenopathy/sclerosing cholangitis/ choldeochal cyst/ Mirizzi syndrome Portal adenopathy
Benign biliary stricture	*The commonest cause is iatrogenic stricture post biliary surgery*	*Gall bladder absent* *Intrahepatic dilatation*
Klatskin tumours *("hilar" cholangiocarcinoma)*	*Loss of weight, progressive jaundice* *Painless unless advanced disease* *no palpable gall bladder*	*Bilirubin high to very high* *WBC normal, may be anaemic* *US – NO galls stones visible, dilated intrahepatic ducts, but CBD & gall bladder normal*

		May have liver mets and ascites
Portal adenopathy *(metastases, lymphoma, rarely TB)*	*Loss of weight, progressive jaundice* *Primary carcinoma usually obvious* *no palpable gall bladder*	*Intrahepatic biliary dilatation* *Nodal mass in porta hepatis*
Mirizzi syndrome	*Cholangitis, tender gall bladder, recurrent bouts of right UQ pain*	*Bilirubin moderate* *WBC elevated* *US –galls stones visible, gall bladder thick-walled and edematous, Intrahepatic biliary dilatation*
HIV cholangiopathy	*RUQ pain, chronic diarrhoea, not always jaundiced, HIV with severe immunosuppression*	*Multifocal strictures, segmental dilations of the biliary tract* *Evidence of cytomegalovirus (CMV), cryptosporidium, microsporidium infections*
Sclerosing cholangitis	*Intermittent sepsis and jaundice, pruritus, fatigue* *Associated with ulcerative colitis (75% of cases)*	*Bile duct wall thickening and focal bile duct dilations may be normal early on*
Ascaris infestation	*Children, poor socioeconomic background*	*Intra and extrahepatic biliary dilatation & gall bladder, visible Ascaris in CBD*
Choledochal (Biliary) cyst	*Children and young adults, jaundice, pruritus, cholangitis*	*Intra and/or extrahepatic cystic dilatations of the biliary system*

Does the patient have cholangitis? *Any of the above causes of biliary obstruction can be complicated by sepsis, typically with gram –ve organisms.*

Cholangitis *Commonest precipitant:* • *gallstones* • *blocked biliary stent* • *ERCP without adequate drainage* *Requires biliary obstruction and infected bile*	***Charcot's triad- rigors, pain, jaundice*** *It is a clinical diagnosis* *Need to have a high index of suspicion (do not delay starting treatment while waiting for investigations)* *Can develop septic shock*	*Bilirubin moderate to high* *WBC very high* *US – depends on the primary cause of biliary obstruction, but may have cholangitic liver abscesses*

I am not quite sure what is going on, and I need more information

HPB conditions are heavily reliant on high-quality imaging, and through multidisciplinary review. A lot of conditions are inaccessible and do not allow histological confirmation of the diagnosis, so therapeutic decisions are frequently based on a clinical and radiological evaluation only.

Different units adopt protocols to the availability of equipment, local skill and expertise.

Most diagnoses, other than obvious CBD stones, need more imaging than the US alone.

It is important to recognize and treat cholangitis early. Avoid dehydration and correct coagulopathy while awaiting further investigations.

Imaging investigations in obstructive jaundice

Test	Ideal context	Issues to consider
Abdominal US	Best in thin patients, excellent to confirm calculi, biliary dilatation, gall bladder inflammation	The most widely used ***FIRST imaging*** test Operator dependent, but easily available and relatively cheap. Not good to image pancreas or retroperitoneum.
Abdominal CT	Best for obese patients, or suspected retroperitoneal or pancreatic pathology	***Essential investigation*** in cases of suspected malignancy; moderately expensive, uses IV contrast
MRCP	A non-invasive way of imaging biliary system No risk to the patient	Not therapeutic (diagnostic information only) Increasingly available Expensive, often unnecessary if a PTC or ERCP is clearly indicated
ERCP	Excellent imaging of biliary and pancreatic system& allows therapeutic intervention. Ideal to extract CBD stones or to palliate jaundice in advanced peri-ampullary malignancy	Invasive, potential complications include pancreatitis, bleeding, perforation and cholangitis. Requires advanced endoscopic expertise & hospital admission
PTC	Excellent imaging of intrahepatic biliary system & allows therapeutic intervention Best to palliate jaundice in advanced Klatskin tumours	Invasive, potential complications include cholangitis and bleeding Requires advanced radiological expertise & hospital admission.
Endoscopic US	Excellent visualization of pancreas and distal CBD	Limited availability and skill Invasive potential complications

	Best tool to guide directed biopsy of suspicious lesions in the pancreas	include pancreatitis, bleeding, perforation Requires advanced endoscopic expertise
Laparoscopy	Useful to look for early peritoneal metastases in suspected malignant disease	Commits patient to surgery, uses theatre resources, requires surgical expertise

The role of the junior surgeon on this context is the ward care of the patients (highly prone to intermittent sepsis, renal failure and nutritional deficit), and to manage sensibly all the complex permutations of investigations available. Always discuss with the senior consultant prior to booking investigations, particularly invasive procedures like ERCP and PTC.

SHOULD I OPERATE OR NOT?

The decision to intervene surgically, or endoscopically is complex and always requires senior supervision.

You have to know **when to intervene** and **when not to**. There is no substitute for clinical experience, and the heterogeneity of clinical conditions makes a one-size-fits-all approach impossible.

All cases need thorough review, and ***great harm comes from inappropriate surgery***, especially in advanced malignancy.

These are some thoughts to guide your decision making

Common diagnosis	Early intervention	Definitive treatment
Choledocholithiasis	*ERCP & stone extraction*	*Laparoscopic cholecystectomy, once CBD is cleared*
Cholangitis	*Initial resuscitation with IV antibitiotics and IV fluids.* *Correct coagulopathy.* *If not improving may require organ support and ICU referral.*	*Adequate biliary drainage* *(e.g. stone extraction or stenting, usually via ERCP)*
Periampullary carcinomas (*HOP carcinoma, distal cholangio, ampullary carcinoma)*	*ERCP & stent* *…but inappropriate deployment of CBD stent can trigger sepsis and delay curative surgery*	*A proportion of cases with early disease may be cured by surgical resection (pancreaticoduodenectomy or Whipple's procedure.* *Incurable cases are well palliated by ERCP stent*

Chronic pancreatitis	*ERCP only if cholangitis present*	*Persistent jaundice requires intervention*
		Inflammatory mass or stricture
		• *Surgical management*
		  ○ *Resection e.g Whipple's*
		  ○ *Drainage procedure e.g Frey procedure*
		  ○ *Biliary bypass e.g hepaticojejenostomy)*
		• *Endoscopic management*
		  ○ *Biliary stent*
		Pseudocyst
		• *Surgical management*
		  ○ *(internal drainage e.g. cystgastrostomy)*
		• *Endoscopic management*
		  ○ *EUS guided drainage of the cyst*
		  ○ *Biliary stent*

CHAPTER 6. Doctor, I have excruciating abdominal pain! An approach to the acute abdomen

Eugenio Panieri & Adam Boutall

Context: casualty

Introduction

Severe abdominal pain is a common reason for a visit to the emergency department. A number of cases settle spontaneously, yet others may harbour lethal conditions that require you to make a rapid, accurate diagnosis and urgent intervention.

The patient groaning with abdominal pain, lying on a hospital stretcher is the true test of surgical diagnostic thinking- it easily differentiates the competent clinician with a clear, structured approach, from a befuddled, uncertain one. It takes the consultant one post-call ward round to decide which registrars to trust, and which ones need to go back to the basics!

There is no substitute for a sound approach and thorough clinical evaluation of such cases. You have to take time, ask a comprehensive set of questions about the presenting symptoms, associated complaints, and a systematic enquiry. Always examine the patient properly. Do not throw your hands up in the air, and "just do bloods and order a CT"; apply your mind and **MAKE A CLINICAL DIAGNOSIS**! Don't poke the patient's belly through his/her clothes and run off to "look at the scans". Be inquisitive, and take pride in the clinical assessment of each case.

Try to decide if this is a brand new symptom, or if it reflects a progression of long-standing disease. Is this an ***acute problem or an exacerbation of a chronic condition***?

DESCRIBE THE PAIN THOROUGHLY: define the presenting complaint

Location and radiation	*Where is it, and where does it radiate to?* RUQ- liver or biliary tree Back- pancreatitis Groin-renal colic RIF- appendicitis
Temporal elements	*The onset, frequency, and duration of the pain are helpful features* Pancreatitis= gradual and persistent Perforation/ peritonitis = sudden onset & high intensity
Quality	Burning pain= gastritis /peptic ulcer disease Colicky/cramping pain=gastroenteritis / intestinal obstruction.
Severity	*The severity of the pain generally is related to the severity of the disorder, especially if acute in onset* Excruciating= acute mesenteric ischemia high intensity= biliary / renal colic / small bowel obstruction moderate= gastroenteritis, appendicitis
Precipitants or ameliorating factors	*Identify what precipitates or improves the pain* chronic mesenteric ischemia = starts within one hour of eating duodenal ulcers = relieved by eating and recur several hours after a meal pancreatitis = relieved by sitting up and leaning forward & strong association with alcohol intoxication Peritonitis = patients lie motionless on their backs

ASK ABOUT ASSOCIATED SYMPTOMS: what else is going on?

GIT symptoms	*Is the gut working or not??* nausea, vomiting, diarrhoea, dysentery, constipation, hematochezia, melena, and changes in the stool. When last did the patient pass flatus? *Is the liver working or not?* ask about jaundice and changes in the colour of urine and stool
Genitourinary symptoms	*Is there a genitourinary cause for their abdominal pain? This is quite common!* dysuria, frequency, hematuria and retention
Gynaecological history	*Consider sexually transmitted diseases, pelvic inflammatory disease, and pregnancy in premenopausal women* menstrual history (LMP, previous period, cycle length) use of contraception vaginal discharge or abnormal PV bleeding dyspareunia or dysmenorrhea
Constitutional symptoms	fevers, rigors= peritonitis, UTI, cholangitis fatigue, weight loss, and anorexia =malignancy, TB, systemic illnesses, inflammatory bowel disease

TAKE A COMPREHENSIVE HISTORY: this allows you to consider other causes, and contextualise the patient's fitness for intervention

Cardio-respiratory symptoms	*Could there be a non abdominal cause of pain? Does the patient have co-morbidities?* cough, shortness of breath, orthopnea, exertional dyspnea, angina = pulmonary or cardiac aetiology for the pain?
Past medical history	Previous abdominal surgery = ? bowel obstruction cardiovascular disease (CVD) = ?MI or mesenteric ischaemia recent trauma= ? traumatic pancreatitis HIV+ve= abdominal tuberculosis Previous malignancy= cancer recurrence/ obstruction?
Medication history	*Describe a comprehensive medication list, including over the counter medications* NSAIDs= gastritis, peptic ulcer disease recent antibiotics= Clostridium difficile steroids = adrenal insufficiency recent chemotherapy = immunosuppressed & atypical presentations of abdominal pain.
Precipitants & other aetiological factors	alcohol = pancreatitis, acute gastritis, hepatitis IV drug users= endocarditis, mesenteric ischaemia, hepatitis, drug withdrawal states Travel history= hepatitis, gastroenteritis, colitis, parasitic disease Recent blunt or penetrating trauma= delayed bowel perforation, pancreatitis, diaphragmatic herniae, liver haematoma, ruptured bladder

CLINICAL EXAMINATION

Does the patient need active resuscitation?	*Consider the following conditions:* Any cause of peritonitis and septic shock Ruptured AAA Myocardial infarct mesenteric ischaemia & small bowel infarction Severe acute pancreatitis
General examination	Pyrexia= peritonitis, TB, UTI, PID Anaemia= malignancy , chronic disorders, AAA *(acute GIT bleeds seldom complain of pain)* Jaundice= biliary obstruction, hepatitis, sepsis Dehydration/ malnutrition= bowel obstruction, malignancy, TB Peripheral adenopathy= malignancy
Abdominal examination	*Does the patient have clinical signs of peritonism or not?* *This takes much clinical experience and guidance. If unsure, take time and re-examine after an interval. Distract the patient whilst performing the examination* **Inspect**- for scars, herniae, masses, distention (*examine the groins & scrotum)* **Percuss**- pain with gentle percussion= peritonitis Tympany = distended bowel dullness = mass/ organomegaly Shifting dullness = ascites **Palpation**- Distract the patient and be gentle! Start AWAY from the site of most pain, until the end of the examination. Muscular rigidity/"guarding" is an important early sign. *Guarding is typically absent with deeper sources of pain such as renal colic and pancreatitis*. Rebound tenderness = peritonitis **Auscultation**- active, high-pitched bowel sounds = early bowel obstruction. Absent bowel sounds= ileus Bruit or murmur= AAA, renal artery aneurysm
Rectal and pelvic examination	*patients with severe abdominal pain must have a rectal examination*. Stool bolus= Fecal impaction & obstruction in older adults tender PR =retrocecal appendicitis & pelvic abscess blood PR= colitis, colorectal malignancy, bleeding PUD *All women with acute lower abdominal pain should have a pelvic examination* Cervical excitation tenderness= PID (Can also occur with peritonitis) Blood PV= miscarriage or failed abortion PV discharge= PID Tender PV, low BP & anaemia= ectopic pregnancy

Differential diagnosis

There are multiple diagnoses to consider, and unless you use a structured approach the clinical scenarios can feel overwhelming.

It is practical to consider a diagnostic algorithm that starts with a broad range of conditions and narrows down to the ones most pertinent to a surgical unit.

Whilst not very "scientific", approach the aetiology of the abdominal pain by considering two categories, ***medical causes & surgical causes***- if you are confident that the medical causes are not a factor, then the patient and the diagnosis is 100% your responsibility!

"Medical" causes of severe abdominal pain

Very common	Occasional	Rare
Gastro-enteritis Pyelonephritis, renal colic, cystitis, urinary retention PID	colitis Pneumonia, Pleurisy MI, acute pericarditis DKA Acute hepatitis	Herpes zoster Porphyria Hypercalcaemic crisis Addisonian crisis Sickle cell crisis Lead poisoning Tabes dorsalis Phaeochromocytoma & hypertensive crisis

"Surgical" causes of severe abdominal pain

To differentiate the surgical causes of an acute abdomen, decide on where the "epicentre" of the pain is, consider the anatomical structures in that region- accept that there may be overlap between diagnoses and that clinical symptoms and signs evolve over time.

Irrespective of the abdominal site of the pain, ***ALWAYS CONSIDER APPENDICITIS*** in the differential diagnosis. It is the commonest cause of peritonitis in any age group, and if misdiagnosed can be fatal.

Right upper quadrant pain	
Common Causes	***Clinical features***
Biliary colic	Intense, dull discomfort located in the RUQ or epigastrium. Associated with nausea, vomiting, and diaphoresis. Generally lasts at least 30 minutes, plateauing within one hour. Benign abdominal examination
Cholecystitis	Prolonged (>4 to 6 hours) RUQ or epigastric pain, fever. Patients will have abdominal guarding and Murphy's sign
Cholangitis	Fever, jaundice, RUQ pain.
Liver abscess	Fever, RUQ pain, cachexia, anaemia
Appendicitis	Subhepatic location of the appendix can mimic biliary disease
Rare causes	Budd-Chiari syndrome/ adrenal haemorrhage/ Fitz Hugh Curtis syndrome/ metastatic liver disease/ complicated hydatid disease

Left upper quadrant pain *This is the **least common** location for severe abdominal pain; the aetiology overlaps significantly with the common causes of severe pain in the epigastrium*	
Rarer Causes	***Clinical features***
Splenic infarct	Associated with a variety of underlying conditions (eg, hypercoagulable state, atrial fibrillation, and splenomegaly). Commonly presents with pain radiating to the tip of the shoulder, and sympathetic pleural effusion
Splenic abscess	Associated with fever and LUQ tenderness may be a complication of splenic infarction.
Splenic artery aneurysm	LUQ pain, low Hb, and hypovolaemic shock – abdominal apoplexy. Most common in pregnancy

Epigastric & central abdominal pain	
Common Causes	***Clinical features***
Perforated PUD	Sudden, excruciating epigastric pain. Patient unable to move with typical board-like rigidity and peritonism
Acute pancreatitis	Acute-onset, persistent upper abdominal pain radiating to the back.
Gastritis	Abdominal pain, heartburn, nausea, vomiting, and hematemesis. True peritonism uncommon. Common following an ethanol binge.
Liver abscess	Fever, RUQ pain, cachexia, anaemia. *If the abscess is in left lobe of the liver it can cause excruciating epigastric tenderness. A mass may also be palpable*
Small bowel obstruction	Central, cramping, severe abdominal pain, with profuse biliary vomiting. Prominent abdominal distention. Peritonism only if the bowel is ischaemic.
Appendicitis	In the early phases of appendicitis, the pain is centrally located. In cases with a free perforation and generalized peritonitis, the pain is diffuse.
Rare causes	Mesenteric ischaemia/ AAA/ acute on chronic pancreatitits/ pancreatic malignancy/ perforated gastric carcinoma/ primary peritonitis

Lower abdominal pain	
Common Causes	***Clinical features***
Appendicitis	Periumbilical pain initially that radiates to the right lower quadrant. Associated with anorexia, nausea, and vomiting. Low-grade pyrexia and localised peritonism
Diverticulitis	Older patient. Pain usually constant in the left iliac fossa, and present for several days prior to presentation. May have associated nausea and vomiting. Local signs depend on the severity of local complications
PID	Severe central or lateral pain. Sexually active. Vaginal discharge. Marked cervical excitation tenderness. Less impressive GI symptoms
Rare causes	Crohn's disease, TB enteritis, acute colitis, Meckel's diverticulitis, perforated colon carcinoma, torted ovarian neoplasm, endometriosis, iliopsoas abscess, intussusception

Flags for uncommon diagnoses

Patients with concomitant diagnoses (co-morbidity) are still more likely to have a COMMON cause of abdominal pain, than a rare one, but the conditions below should alert you to some unusual pathology- just think about them!

HIV +	TB peritonitis, lymphoma, Kaposi sarcoma of the small bowel, CMV colitis, TB iliopsoas abscess
Anaemia & Cachexia	Obstructed/ perforated GIT cancer, Crohn's disease, TB
Vasculopathy	MI, Bowel ischaemia, AAA
Connective tissue disorders	Bowel ischaemia, serositis
Renal failure	Primary peritonitis (*in patients with peritoneal dialysis NB, or nephrotic syndrome*)
Liver failure	Primary peritonitis
Elderly	Obstructed/ perforated GI cancer MI, Bowel ischaemia, AAA
Infant	Necrotizing enterocolits, intussusception, Henoch Schonlein purpura
Pregnant	Ectopic or extrauterine pregnancy, ovarian torsion, fibroid degeneration Abruptio placenta
Recent chemotherapy	Colitis
Psychiatry	Swallowed foreign body, trauma, fictitious disorder Urinary retention in Alzheimer's

Evaluation priorities

How sick is the patient? Do I need to start a resuscitation protocol?

- Hb, blood gas, WBC
- Start IV fluid rehydration, consider early IV antibiotics

The acidotic or confused patient is critically ill and needs urgent intervention. Beware the young fit patient with a normal PH but a low PCO2(compensated metabolic acidosis) they may look well but decompensate quickly.

How bad is the pain? Give adequate analgesia, typically parenteral opiates

What is the diagnosis?

Have I excluded "medical causes" of acute abdomen?

Check urine, pregnancy test, CXR, AXR, ECG, U&E, LFT, lipase

Does the patient OBVIOUSLY need an urgent operation?

Don't delay surgery when it is needed! Get on with it!

I am not quite sure what is going on, and I need more information

Re-evaluate the patient clinically at 6-12 hour intervals, review with a colleague

Commonly used emergency investigations

Test	Ideal context	Issues to consider
Abdominal US	Thin patient, good in biliary and gynae pathology	Operator dependent, but widely available and relatively cheap
Abdominal CT	Best for obese patients, or suspected retroperitoneal or pancreatic pathology	***By far the best investigation*** but it is expensive, uses IV contrast, and is not always available
Laparoscopy	Excellent to differentiate appendicitis from PID	Commits patient to surgery uses theatre resources, requires surgical expertise

- A number of acute surgical conditions evolve (or resolve!) over 12 to 24 hours, and some diagnostic mysteries become obvious with time and re-evaluation.
- You will develop clinical wisdom to accept uncertainty, and constantly re-evaluate your diagnosis in light of the clinical state of the patient.
- Don't be dogmatic. If the patient isn't responding to your management, revisit the story and the working diagnosis. Think again.
- Don't accept "diagnostic labels" until they are unequivocally proven.

What other investigations must I consider? *Be selective in the investigations, and use common sense instead.*

The investigations below are *occasionally* helpful.

Test	Ideal context	Issues to consider
Contrast study	Can demonstrate obstructions or subtle leaks from the GIT, especially from the oesophagus	Largely replaced by CT scans with either oral or rectal contrast.
Endoscopy	Seldom helpful in acute abdominal pain	VERY uncomfortable for the patient
Angiography	Vascular cases with occult bleeding or false aneurysm	Requires very specific endovascular skills
ERCP	In selected cases of cholangitis only	Requires very specific endoscopic skills

SHOULD I OPERATE OR NOT?

The decision to intervene surgically is the most significant of all the issues that pertain to the management of a patient with acute abdominal pain.

Some cases HAVE to undergo emergency surgery, whilst others will be harmed by unnecessary surgery. Correct case selection is THE CORE SKILL that you have to develop as a surgeon.

You have to know **when to operate** and **when not to operate**. There is no substitute for clinical experience, and the heterogeneity of clinical conditions makes a one-size-fits-all approach impossible.

Almost all cases benefit from a few hours of preoperative resuscitation before an operation, …..BUT ***great harm comes from delays in surgery***, and reliance on un-necessary imaging tests only available in another hospital! Acute sepsis and ischaemic bowel need surgery within a few hours, not days.

These are some thoughts to guide your decision making.

Need early surgery	*Can be treated conservatively*	*Best with interventional radiology & perc drain*	*Avoid surgery in these!*
Appendicitis Perforated PU Ischaemic bowel Diffuse peritonitis from any cause	PID Gastritis Cholecystitis Cholangitis Appendicitis* occasionally	Diverticular abscess Appendix abscess Liver abscess	Any “medical cause” of acute abdomen Acute pancreatitis

CHAPTER 7. Doctor, I am vomiting blood! An approach to haematemesis and melena

Eugenio Panieri

Context: Emergency Unit

INTRODUCTION

Haematemesis almost always implies that the bleeding source is in the foregut, above the ligament of Treitz, originating from the duodenum, stomach or oesophagus.

Some of this blood will be vomited, and some will transit through the gut, and eventually exit as a dark, sticky, black stool: the characteristic appearance of melena. Some patients never vomit at all, and just present with melena, or if the bleeding is of high volume, even with fresh, unaltered blood per rectum.

Occasionally a patient will vomit blood that has accumulated in the stomach from a non-GI source- either from severe epistaxis or heamoptysis these are usually clinically obvious.

Bleeding from the small bowel is extremely rare and will present with melena or fresh bleeding PR, and will not regurgitate back into the stomach, against persistalsis, to be vomited out.

Differential diagnosis

Common	Clues
Oesophagitis	Reflux symptoms
Gastritis	Recent alcohol binge/ NSAID's/ ICU stressed patient
Peptic ulcer (GU or DU)	NSAID's
Oesophageal varices	Liver disease
Mallory Weiss tear	Repeated retching, often after alcohol binge
Uncommon and weird	
Warfarin toxicity	Take a drug history
Gastric carcinoma	Older patient, LOW
Oesophageal carcinoma	Dysphagia or reflux symptoms
GIST	Palpable abdominal mass
Dieulafoy's lesion	Older patient, big bleed
Haemosuccus Pancreaticus	Chronic pancreatitis
Haemobilia	Liver abscess or recent liver trauma
Don't want to miss	
Upper GI cancers	Often has no other symptoms at all

Modified Blatchford Score	
Admission risk marker	**Score**
Blood Urea	
≥6·5 <8·0	**2**
≥8·0 <10·0	**3**
≥10·0 <25·0	**4**
≥ 25	**6**
Haemoglobin (g/L) for men	
≥12.0 <13.0	**1**
≥10.0 <12.0	**3**
<10.0	**6**
Haemoglobin (g/L) for women	
≥10.0 <12.0	**1**
< 10.0	**6**
Systolic blood pressure (mm Hg)	
100–109	**1**
90–99	**2**
<90	**3**
Pulse	
Pulse ≥100 (per min)	**1**

Blatchford score 0-1 = early discharge
urgent endoscopy (1 week)

Score is equal to "0" if the following are all present:

- *Hb>12.9g/dL (men)or >11.9g/dL (women)*
- *Systolic blood pressure >109 mm Hg*
- *Pulse <100/minute*
- *Blood urea nitrogen level <6.5*
- *No melena or syncope*
- *No liver disease or heart failure*

Blatchford score 1-6= manage in medical wards
oral PPI
scope within 24 hrs

Scores of 6 or more were associated with a greater than 50% risk of needing an intervention

Blatchford score > 6= admit in surgery
IV PPI
scope within 24 hrs

Blatchford score >10=scope within 6-12 hrs

EVALUATION PRIORITIES

- *How bad is this going to be?* (severity scoring)- the **modified Blatchford score** is the most validated way of determining the severity of bleeding before any endoscopy assessment is done. This will assist in deciding which patients need immediate endoscopy, versus who can wait until the following day
- The **appearance of the ulcer at endoscopy** predicts the risk of rebleeding and thus helps to guide the need to intervene endoscopically.
- **Rockall score**- is an overall score that includes both clinical presentation AND endoscopic diagnosis- this help predict the overall outcome, but it can only be calculated AFTER the endoscopy is performed.
- *Is this a variceal bleed or not?*
- Patients with known liver disease (cirrhosis/ alcoholic/ hepatitis) or with clinical signs of liver disease are assumed to be bleeding from portal hypertension and oesophageal varices. However up to 1/3 of patients with known oesophageal varices bleed from other causes, such as peptic ulcers or gastritis, so they must ALWAYS have an endoscopy.

RESUSCITATION AND INITIAL MANAGEMENT

Transfuse patients with massive bleeding with blood, platelets and clotting factors in line with local protocols for managing massive bleeding.

Endoscopy

Endoscopy is the primary diagnostic investigation in patients with acute upper gastrointestinal bleeding. Endoscopy aids diagnosis yields information that helps to predict outcome and most importantly allows treatments to be delivered that can stop bleeding reduce the need for transfusion and reduce the risk of re-bleeding and the length of hospital stay. It allows risk assessment for both variceal and non-variceal haemorrhage and who is eligible for endotheraphy.

(See Ulcer risk stratification Forrest Classification with the Blatchford score)

Timing of endoscopy

- Patients who remain unstable should be evaluated in theatre with airway protection.
- The vast majority of patients will stabilise with resuscitation
- Those with a high Blatchford score > 8 should have endoscopy urgently, ideally within 6 -12 hours.
- The others should have endoscopy within 24 hours of admission; they should not wait the whole weekend

Endotherapy

The bleeding source should be treated endoscopically.

Dual therapy with Injection 1/10000 adrenalin + heater probe or Endoscopic clip is best

Varices should be treated by banding.

The appearance of the ulcer at endoscopy predicts the risk of rebleeding and thus helps to guide the need to intervene endoscopically.

Stigmata of ulcer haemorrhage	***Risk of recurrent bleeding without endoscopic therapy***
Arterial spurt (active bleeding)	70- 100%
Non-bleeding visible vessel	30- 50%
Non-bleeding adherent clot	8-35%
Oozing ulcer	10-27%
Flat spot	<8%
Clean base ulcer	<3%

CHAPTER 8. Doctor, I am passing blood per rectum! An approach to haematochezia

Eugenio Panieri & Adam Boutall

Context: Emergency Unit

Introduction

Fresh bleeding per rectum most commonly means that the bleeding source is from the hindgut, originating from the colon, rectum or perianal pathology.

Perianal conditions will usually cause red blood on the toilet paper or blood dripping into the toilet bowl after defecation, and are seldom of haemodynamic consequence; whereas colonic bleeding is usually mixed with stool.

A brisk upper GI bleed can occur without haematemesis, and a high volume of blood may rush unchanged through the gut and appear "fresh" per rectum.

Bleeding from the small bowel is rare.

Differential diagnosis

Common	Clues
Haemorrhoids	Fresh squirt of blood after defecation or on toilet paper
Diverticular disease	Older patient large amount of altered blood acutely
Colon carcinoma	LOW, change of bowel habit, family Hx
Colitis with dysentery	Diarrhoea, with blood
Uncommon and weird	
Warfarin toxicity	Take a drug history
Angiodysplasia	Diagnosis by exclusion/ older patient
Intussusception	Abdominal pain/ bowel obstruction/ younger patient
Meckel's diverticulum	Younger patient
Mesenteric ischaemia	Vasculopath
Don't want to miss	
Upper GI bleed	Heamodynamic unstable
Colorectal cancer	Often has no other symptoms at all

Evaluation priorities

How bad is this?
There is no universally accepted scoring system, and fortunately, most patients (irrespective of the cause) stop bleeding without needing intervention.

Could this be a severe upper GI bleed?
Any patient who presents with a haemodynamically unstable bleed must have an upper GI source of bleeding excluded before the cause can be assumed to arise from the hindgut.

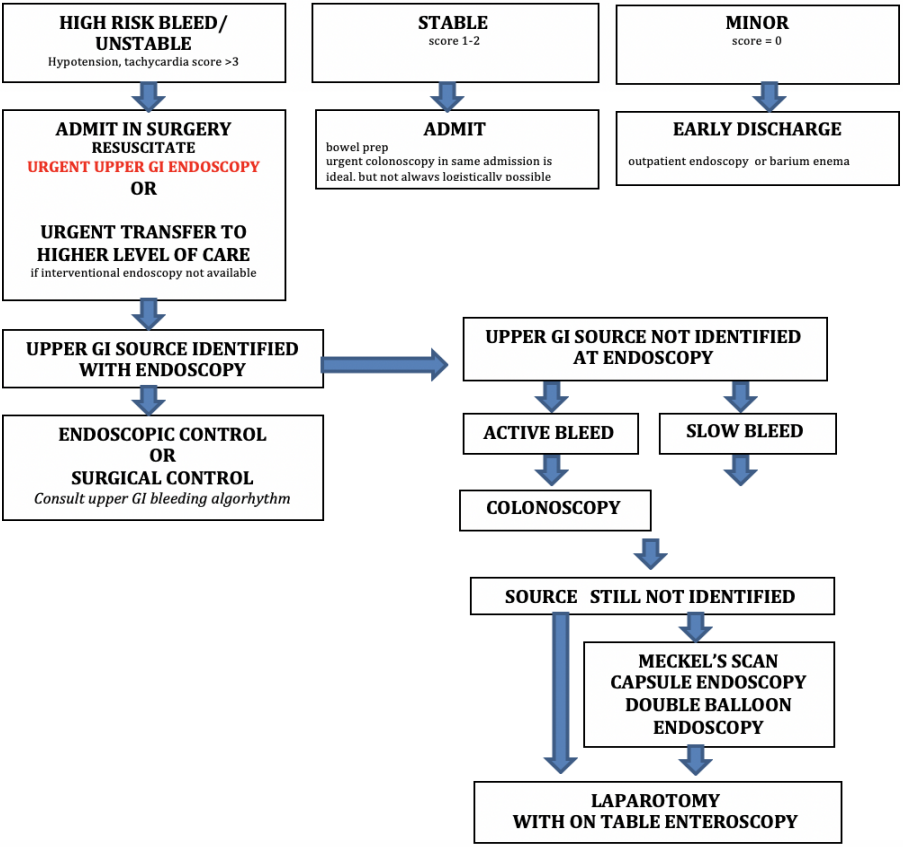
Is this really just haemorrhoids?
Patients often attribute any perianal or defecation symptom to a self-diagnosis of "haemorrhoids". It is essential to perform a thorough perianal examination and procto-sigmoidoscopy in all cases, and to actively exclude a colorectal carcinoma even in those patients who really do have "haemorrhoids".

Is this really just haemorrhoids?
Patients often attribute any perianal or defecation symptom to a self-diagnosis of "haemorrhoids". It is essential to perform a thorough perianal examination and procto-sigmoidoscopy in all cases, and to actively exclude a colorectal carcinoma even in those patients who really do have "haemorrhoids".

Lower GI Bleeding Score	
Admission risk marker	**Score**
Blood Creatinine	
≥150	1
Haemoglobin (g/L)	
<10.0	1
Continued bleeding PR	
>12 hrs or rebleed	1
Systolic BP (mm Hg)	
<100	1
Patient Age	
>60	1
Pulse	
Pulse ≥100 (per min)	1

LOWER GI BLEEDING ALGORHYTHM

THINK	DO	PLAN
is the diagnosis of Lower GI bleeding correct? what is the aetiology ? Could this be a major upper GI bleed with fresh blood PR? Could this be a dysenteric illness? Have you excluded perianal causes?	request urgent FBC, INR urea and electrolytes monitor pulse, BP, urine output, oxygen saturation send stool for M,C&S if infective illness suspected resuscitate the patient	The patient's response to resuscitation is key in determining management Most lower GI bleeding stops spontaneously, but..... Risk stratify according to lower GI bleeding score Transfer high risk patients early



FURTHER CONSIDERATIONS ABOUT MANAGEMENT

- Major bleeds are uncommon.
- Usually the bleeding is self-limiting.
- Perform a thorough perianal examination including proctoscopy and rigid sigmoidoscopy to exclude perianal or rectal causes of bleeding
- Resuscitation and aggressive management is mandatory in cases at high risk (score >3)
- Patients with ongoing bleeding are complex, and should be transferred to regional, or provincial hospitals early

CHAPTER 9. Doctor, I am vomiting! An approach to the different types of bowel obstruction

Eugenio Panieri

Context: Emergency Unit

Introduction

Nausea and vomiting are very common symptoms, and frequently trigger a visit to the emergency unit. The differential diagnosis is huge; surgical conditions represent a minority of these but can be lethal if missed or mismanaged.

A practical approach is to evaluate if a patient has a ”surgical” cause of vomiting or not, then to decide which of the surgical causes you are dealing with. This is primarily a clinical decision, based on a good quality history, full clinical examination, and some investigations, typically urine analysis, blood U&E’s, FBC, lipase, and some plain abdominal and chest X-rays.

You have to ask explicitly what is the nature of vomitus- is it deep green, feculent, yellow or old food? What is the volume and frequency? Is pain an associated feature? What is the gut function like? Is the patient passing stool, and is it normal? Is the patient passing flatus?

<table>
<tr><th>Non-surgical Causes</th><th>Surgical causes</th></tr>
<tr><td>Drugs & intoxication</td><td rowspan="2">Vomiting associated with intra-abdominal sepsis or inflammation
Appendicitis
Cholecystitis
Perforated viscus
Pancreatitis
Mesenteric ischaemia</td></tr>
<tr><td>Infectious causes
Gastro-enteritis
Systemic sepsis (ie. pyelonephritis or otitis)</td></tr>
<tr><td>CNS
Raised intracranial pressure
Migraines & seizures
Labyrinthine disorders</td><td>Vomiting due to a mechanical obstruction
Gastric outlet obstruction
Small bowel obstruction
Large bowel obstruction</td></tr>
<tr><td>Psychiatric</td><td rowspan="2">Vomiting due to gut dysmotility
Achalasia
Gastroparesis
Intestinal pseudo-obstruction</td></tr>
<tr><td>Metabolic & Endocrine
Pregnancy
DKA
Acute liver or renal failure</td></tr>
</table>

On examination pay specific attention to signs of dehydration, weight loss, anaemia and pyrexia. The abdominal examination must include all hernia sites (it is easy to miss inguinal and femoral hernias), rectal examination, and an evaluation of previous scars or penetrating injuries to the abdomen and chest.

Differential diagnosis

Differentiating the surgical causes is difficult, and it is not unusual to get it wrong. The table below will be of some assistance: we have highlighted in red the dominant symptoms and signs.

	Intra-abdominal sepsis	Gastric Outlet Obstruction	Small Bowel Obstruction	Large Bowel Obstruction
History				
Onset	Sudden	Insidious	***Sudden***	Gradual
Content	Yellow/ green	***Old food***	***Bilious/green***	Feculent
Volume	Variable	Large	***Large***	Variable
Pain	***Severe***	Nil	***Cramping central***	Vague
Bowel function	unchanged	unchanged	Late obstipation	***Obstipation early***
Examination				
Pyrexia	***Yes***	No	No	No
LOW/anaemia	No	Yes	No	Yes
Peritonism	***Yes***	No	No	No
Abdo distention	Variable	No	***Yes***	***Marked***
PR	Normal	Normal	Variable	***empty***
Special investigations				
Plain X-ray	Ileus Subphrenic air Normal	Gastric distention	Multiple small bowel air-fluid levels Little or no gas in Large bowel	Distended large bowel

Evaluation priorities

How bad is this?

- Resuscitate and/ or rehydrate the patient
- Consider nasogastric tube drainage
- Admit to the ward

Is this a mechanical obstruction or is this an "ileus" due to intrabdominal sepsis?

- The presence of pyrexia and peritonism strongly suggests intra-abdominal sepsis

Does the patient need an urgent operation tonight or can we re-evaluate the case tomorrow morning with a colleague?

- Septic shock & diffuse peritonism mandate urgent surgery
- Most cases will benefit from 12-24 hours of IV rehydration and NGT decompression before surgical decisions are made

What other investigations must I consider?

- This depends on the working diagnosis-
    - GOO will require upper GI endoscopy
    - LBO may need a colonoscopy or CT scan
    - SBO may be treated conservatively if caused by adhesions

Real problem scenarios! I am not sure what's going on! Is this large or small bowel obstruction?

- Get a consultant to review the case.
- Consider a CT scan.
- Be wary of operating because you don't know what else to do
- bowel obstruction = challenging laparotomy.

CHAPTER 10. Doctor, I am vomiting old food! An approach to gastric outlet obstruction

Eugenio Panieri

Context: Emergency Unit

Introduction

The pathology almost always is in the antrum of the stomach or first part of the duodenum. Oesophageal obstruction will usually cause dysphagia, not vomiting, and more distal obstruction is characterized as SBO.

Patients typically present vomiting partly digested old food; since the site of obstruction is above the Ampulla of Vater, there is no bile staining.

Other associated symptoms are repeated burping, halitosis, and "heartburn" type symptoms. Patients will vomit intermittently, once or twice a week, and will have lost weight by the time they seek medical attention. Abdominal pain is hardly ever a feature of GOO.

On examination pay specific attention to signs of dehydration, weight loss, anaemia, jaundice and supra-clavicular adenopathy. Abdominal examination may reveal an epigastric mass or succession splash.

Differential diagnosis

Common Causes (>95%)	Unusual
Gastric carcinoma ***Peptic ulcer (gastric or duodenal)*** Extrinsic compression by pancreatic pathology • Pancreatitis/ carcinoma HOP Strictures following corrosive ingestion	**In the lumen** Gall stone, food bolus or foreign body obstruction **In the wall** Chrons disease TB Other GI neoplasm • Polyps/GIST/lymphoma/Kaposi • Duodenal carcinoma **Extrinsic** Gastric volvulus Duodenal bands SMA syndrome **Dysmotility** Gastroparesis • Autonomic neuropathy in diabetics • Acutely ill post-op patients (toxic gastroparesis)

Evaluation priorities

How bad is this?

- rehydrate the patient, and correct the expected electrolyte derangements
- nasogastric tube drainage and lavage the stomach flavoured isotonic saline solution for 2-3 days- this empties the stomach of old food that would obscure endoscopy
- Admit to the ward.
- GOO does not require emergency intervention

What is the cause?

Gastric carcinoma	Epigastric mass, anaemia and adenopathy
Peptic ulcer	History of NSAID's
Carcinoma pancreas	Mass, anaemia and adenopathy, jaundice
Chronic pancreatitis	Alcohol history, episodes of pain, steatorrhoea
Corrosive stricture	Psychiatric history, recent suicide attempt with ingestion of corrosives

What other investigations must I consider?

- The key investigation is an ***upper GI endoscopy***.
    - This will confirm the diagnosis and differentiate between gastric carcinoma and a peptic ulcer.
    - All gastric ulcers MUST be biopsied- an eyeball test is not good enough!
    - It is best to delay endoscopy by 2-3 days in order to prepare the stomach properly
- A US or CT scan may be helpful in cases of pancreatic pathology, or to stage further a newly diagnosed gastric carcinoma.

Real problem scenarios!

The stomach is full of food on endoscopy!

- It confirms the patient has GOO!
- Delay x 48 hours and lavage the stomach
- Repeat scope

The endoscopy can't see a mucosal lesion, there is nothing to biopsy!

- Book a CT scan to see if there is pancreatic compression or a pseudocyst

The gastric ulcer looks like cancer, but the biopsy is negative!

- Discuss with your consultant
- How many biopsies were taken (a minimum of 4 must be taken in each case!)
- Consider a repeat endoscopy and re-biopsy

When must we operate?

- Not every case needs surgery, and management must be individualized depending on the aetiology
    - Some PU can be treated with balloon dilatation and medications
    - GCA and HOP Ca may be palliated with a stent
    - Pancreatic pseudocyst may be drained internally via endoscopy

CHAPTER 11. Doctor, I am vomiting and have cramping abdominal pain! An approach to small bowel obstruction

Eugenio Panieri & Adam Boutall

Context: Emergency Unit

Introduction

Patients present with sudden onset of vomiting and severe cramping central abdominal pain. The vomiting is typically relentless, large volume and deeply bile stained. The most distal the obstruction the more brown or "feculent" it can appear. The patient will become obstipated after 12-24 hours of symptoms, or sooner if the obstruction is complete.

Since the majority of cases are caused by adhesions or incarcerated hernias, most patients do not have signs of chronic illness.

On examination pay specific attention to signs of dehydration. The abdominal examination must include a meticulous search of all hernia sites. Don't forget to examine for signs of previous penetrating chest trauma- a diaphragmatic hernia is easy to miss! The abdomen is distended, but should not be peritonitic, unless a perforation or bowel necrosis has occurred.

Differential diagnosis

Common Causes (>90%)	Unusual
Adhesions ***Incarcerated hernia***	**In the lumen** Gall stone, food bolus or foreign body obstruction **In the wall** Chrons disease TB Radiation enteritis Colonic carcinoma (caecum carcinoma can cause SBO only!) Small bowel neoplasm • polyps/GIST/lymphoma/adenocarcinoma/metastases **Extrinsic** Volvulus Adherence to inflammatory mass (appendix/ diverticular abscess) Intra-peritoneal carcinomatosis Compression by non GI neoplasm • Gynae-oncology • Retroperitoneal sarcoma **Dysmotility** Autonomic neuropathy in diabetics/ post spinal cord injury Post op patients (post-operative ileus)

Evaluation priorities

How bad is this?

- Rehydrate the patient, and correct the expected electrolyte derangements
- Nasogastric tube drainage

Is this really SBO?

- Make sure this is not a presentation of an infective or inflammatory intraperitoneal condition (don't miss appendicitis!!!)

What is the cause?

Adhesions	Presumptive diagnosis if the patient has a history of previous laparotomy NB cesarian sections are a very unusual cause of intraperitoneal adehsions!
Hernia	An incarcerated hernia = cause of bowel obstruction

Is the bowel obstruction complete or incomplete?

- Obstipation, gross distention, and lack of colonic gas imply the obstruction is complete

Is this adhesive bowel obstruction?

- Ideally, all adhesive small bowel obstructions should have an oral water-soluble contrast dose, followed by an abdominal X-ray 12-24hrs later. If no contrast is seen in the colon the patient should proceed to laparotomy

Could the small bowel be ischaemic/ compromised?

- Persistent pain, pyrexia, peritonism, leukocytosis, intramural gas or intraperitoneal gas are diagnostic of perforation.

Does the patient need an operation?

- Uncomplicated, partial adhesive bowel obstruction can be managed conservatively
- Irreducible hernias and cases suggestive of bowel ischemia MUST have an urgent operation
- An old dictum is that "all cases of SBO must have a laparotomy unless the cause is adhesions"- this is because most other causes just don't get better by themselves, and need surgery to make a diagnosis and resolve the obstruction

What other investigations must I consider?

- A CT scan should be performed in all cases of diagnostic uncertainty if it is available and laparotomy is not obviously indicated. It can be difficult to distinguish between the small bowel and large bowel obstruction on X-ray. Don't let these investigations delay the surgical decisions by days; patients with SBO do worse if treatment is delayed by >72hrs!

Real problem scenarios!

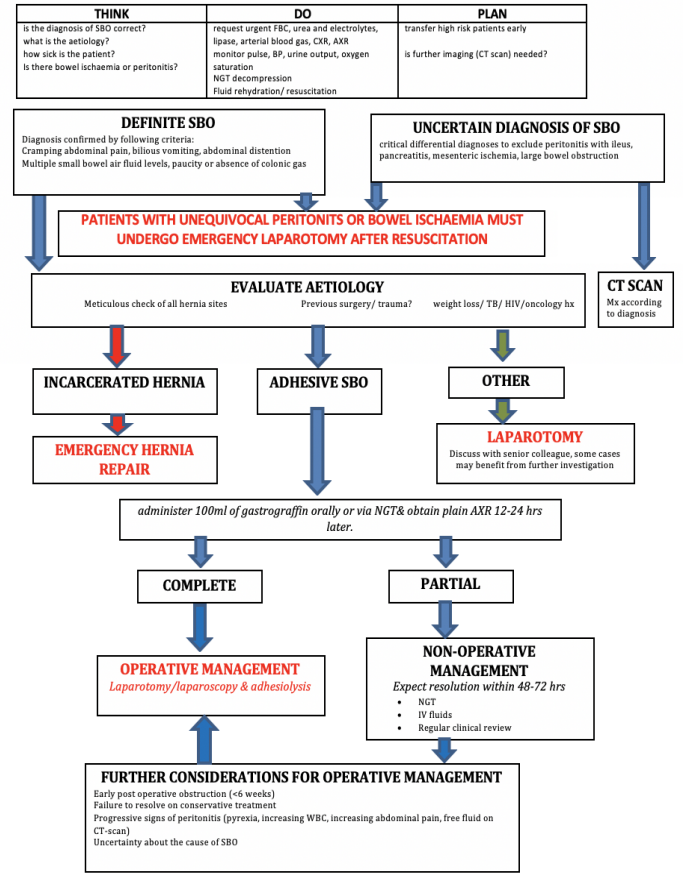
The patient has SBO but has never had surgery, and there are no hernias on examination!

- Review your diagnosis- does the patient really have SBO or is this an ileus from another cause, like acute pancreatitis or appendicitis?
- A CT scan is indicated, only if it can be done without undue delay.
- This may be a case with one of the less common causes of SBO, almost all of which require surgical intervention.
- Discuss this scenario with your seniors- decision making in this context is difficult.

The patient has clear SBO, but also a weird left pleural effusion!

- This is a classic pitfall, and you must consider an irreducible diaphragmatic hernia.
- Look for signs of old penetrating injuries to left chest (take the patient's shirt off, and examine the front and back of the chest properly)- do NOT put in a chest drain until you are 100% sure that this diagnosis is excluded.

SMALL BOWEL OBSTRUCTION ALGORHYTHM



CHAPTER 12. Doctor, my abdomen is swelling up and I can't go to the toilet! An approach to large bowel obstruction

Eugenio Panier & Adam Boutall

Context: Emergency Unit

Introduction

Abdominal distention may be the presenting sign of a range of potential diagnoses, some of which are glaringly obvious (ie pregnancy!) whilst others may really test your diagnostic acumen. The clinical context is very important; age and gender of the patient will strongly influence your decision making and differential diagnosis.

Differential diagnosis of abdominal distention: the 6 F's

Fetus	Pregnancy must always be considered in women, it's easy not to consider it in the perimenopausal years. Take a thorough gynaecological history, and always do a pregnancy test
Fat	Some patients develop predominant abdominal adiposity- clinical evaluation can be very challenging
Flatus	Bowel obstruction, either SBO or LBO, can cause massive abdominal distention, clearly resonant on percussion. Almost all patients will have symptoms of gut dysfunction (nausea, vomiting, constipation, abdominal pain)
Faeces	Faecal impaction can cause clinical features of large bowel obstruction, with colonic distention. Patients with colonic dysmotility can retain a massive volume of faeces in the bowel
Fluid	Ascites is a common "medical" cause of abdominal distention. On occasion patients with an occult malignancy present with malignant ascites and metastatic deposits in the omentum (omental cake). Pseudomyxoma peritonei can cause gelatinous ascites.
Filthy tumour	Ovarian neoplasms are the commonest cause of a large intra-abdominal mass retroperitoneal sarcomas, cystic tumours of the pancreas, GIST tumours of the bowel, and lymphomas are other possibilities

The typical presentation of large bowel obstruction is with a few weeks of progressive, constipation, abdominal distention, obstipation, mild discomfort, eventually followed by severe pain and nausea and vomiting.

On examination pay specific attention to signs of dehydration. Look for anaemia and adenopathy. The abdominal examination must include a meticulous search of all hernia sites. Perform a proper digital rectal examination AND a pelvic examination in women- large ovarian neoplasms are easy to miss if you don't do

this. A complete LBO can cause spectacular abdominal distention, but on palpation, the patient should not have signs of peritonism unless a perforation or bowel necrosis has occurred.

The radiological features of LBO are of distended colonic loops (look for the haustra and peripheral location of the distended bowel), with little or no small bowel distention. The differentiation between SBO and LBO clinically and radiologically can be very difficult, and a discussion with a senior colleague must always be done.

Causes of LBO

Common Causes (>90%)	Unusual
Colonic carcinoma	**In the lumen**
	Foreign body obstruction
Diverticular stricture	Large pedunculated polyp
	In the wall
Sigmoid volvulus	Inflammatory bowel disease (Chrons or UC stricture)
	Infective strictures (TB, ameboma, schistosomiasis)
Faecal impaction	Radiation stricture
	Unusual neoplasm (GIST/lymphoma/ Kaposi's)
Pseudo-obstruction	**Extrinsic**
	Volvulus of the transverse colon or caecum
	Adherence to inflammatory mass (appendix abscess)
	Intra-peritoneal carcinomatosis
	Compression by non GI neoplasm (gynae oncology/retroperitoneal sarcoma/ prostate cancer)
	Internal hernias and adhesions
	Dysmotility
	Autonomic neuropathy in diabetics/ post spinal cord injury
	Post-op patients (postoperative ileus)

Evaluation priorities

How bad is this?

- rehydrate the patient, and correct the expected electrolyte derangements
- nasogastric tube drainage if the patient is vomiting

Is this really LBO?

- make sure this is not a presentation of an infective or inflammatory intraperitoneal condition (don't miss appendicitis!!!), or an SBO.

What is the cause?

Colonic carcinoma	Gradual onset of change of bowel habits may have anaemia
Diverticular stricture	Previous episodes of abdominal pain. Often indistinguishable from a colonic malignancy, until histology specimens are taken
Sigmoid volvulus	Sudden onset of abdominal distention and pain. Characteristic "coffee bean" appearance of distended sigmoid on plain Xray
Faecal impaction	Hard impacted faeces palpable on rectal examination
Pseudo-obstruction	Soft stool present in the rectum on PR. Metabolic derangements (hypokalaemia/ hypercalcaemia/ hypothyroidism) or neurologically frail/ bed-bound patients

Is the bowel obstruction complete or incomplete?

- Obstipation, gross distention, and lack of gas in the rectum imply the obstruction is complete

Could the bowel be ischaemic/ compromised?

- persistent pain, pyrexia, peritonism, leukocytosis, intramural gas or intraperitoneal gas are diagnostic of perforation. The most common site of perforation is the caecum- right iliac fossa tenderness and marked distention of the caecum on X-ray are concerning findings.

Does the patient need an operation?

- Most cases of LBO allow you 24-48 hours of diagnostic workup, before a therapeutic decision is taken
- No case of LBO "gets better by itself"- you need to make a plan.
- Untreated LBO will lead to perforation and cause a catastrophic death unless it is dealt with.
- cases suggestive of bowel ischemia MUST have an urgent operation
- a large bowel operation must be done by a senior surgeon, decision making is complex, and errors can have major consequences

Cause	Treatment options
Colonic carcinoma	Bowel resection/ diverting stoma/ stent
Diverticular stricture	Bowel resection/ diverting stoma/ stent
Sigmoid volvulus	Endoscopic de-torsion, followed by elective resection
Faecal impaction	EUA, and manual disimpaction of the fecaloma
Pseudo-obstruction	Correct underlying metabolic derangements/ fleet enemas/ oral laxatives/ occasionally colonoscopy to decompress

What other investigations must I consider?

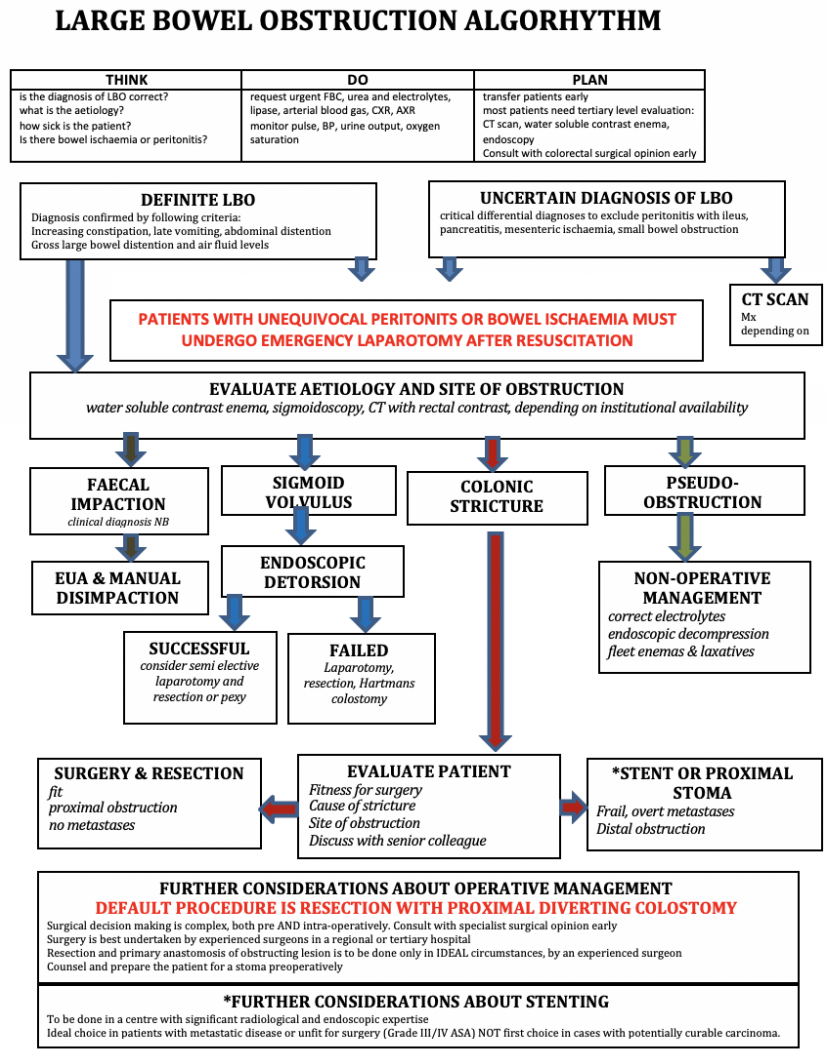
- A CT scan, emergency flexible sigmoidoscopy or contrast enema are the options to evaluate cases. Local availability of these will determine which is used first.

- don’t let these investigations delay the surgical decisions by weeks!

Real problem scenarios!

I am not sure if the patient has SBO or LBO! Review your diagnosis- A CT scan is indicated, only if it can be done without undue delay. Discuss this scenario with your seniors- decision making in this context is difficult.

The patient has clear LBO, but I am not an experienced surgeon, and there is no-one else in my hospital for a long weekend! Refer the patient now. Don’t wait and see.



CHAPTER 13. Doctor, I have bloody diarrhoea and abdominal pain! It is not getting better! An approach to colitis

Eugenio Panieri & Adam Boutall

Context: Emergency Unit

Introduction

Diarrhoea reflects the passage of loose or watery stools, typically at least three times in a 24-hour period. The following definitions have been suggested according to the duration of symptoms:

- Acute – 14 days or fewer in duration
- Persistent diarrhoea – more than 14 but fewer than 30 days in duration
- Chronic – more than 30 days in duration
- Invasive diarrhoea, or dysentery, = diarrhoea with visible blood or mucus, commonly associated with fever and abdominal pain.

Most cases of acute diarrhoea in adults are of infectious aetiology and resolve with symptomatic treatment alone. Surgeons are seldom consulted for this symptom unless there is a diagnostic concern about the possibility of colitis- these patients are generally unwell and have symptoms of DYSENTERY.

Differential diagnosis

There are multiple diagnoses to consider, and unless you use a structured approach the clinical scenarios can feel overwhelming.

It is practical to consider a diagnostic algorithm that starts with a broad range of conditions, and narrows down to the ones most pertinent to a surgical unit - patients with features of **severe colitis** are the ones you will need to manage, often in conjunction with a gastroenterologist.

Symptoms & signs: *Colitis implies inflammation of the colon*

Colitis	Frequent passage of loose stool with /without mucus and blood, abdominal discomfort.
Proctitis	Tenesmus is a characteristic symptom of inflammation of the rectum
Abdominal pain	Common in severe colitis
Examination findings	Pyrexia- infective colitis Abdominal tenderness common Distention= colonic dilatation in severe colitis or with obstruction

	Peritonism- indicative of impending perforation

Differential diagnosis

Common	Clues
Infective Colitis (salmonella) Amaebic colitis Clostridium difficile Ulcerative colitis	Severe dysentery, & abdominal pain, high pyrexia Recent use of antibiotics Intermittent diarrhoea and proctitis, +family Hx, intermittent, loss of weight, episcleritis, erythema nodosum or pyoderma gangrenosum, arhrtitis, PSC
Uncommon and weird	
Ischaemic colitis Drug-induced CMV Intussusception Diversion colitis Diverticultis @ colitis Colonic Crohn's disease Radiation colitis Other infections	Vasculopath Recent chemotherapy, methotrexate HIV +patient, severe immunocompromise Younger patient, bloody diarrhoea, small bowel obstruction, palpable mass Proximal stoma, usually mild colitis in the diverted segment Acute diverticulitis, an elderly patient Rectum usually spared Recent pelvic radiation, often for gynaecological cancer Salmonella, Shigella, Campylobacter, Yersinia, Cryptosporidium
Don't want to miss	
Colorectal cancer with obstruction	Symptoms of bloody/mucous loose stool, and massively distended proximal colon, particularly caecum. Incorrect medical Rx as a "colitis" will result in perforation and death

Evaluation priorities

How bad is this?

Mild	Four or fewer stools per day with or without blood, no signs of systemic toxicity, and a normal erythrocyte sedimentation rate (ESR). Mild crampy pain, tenesmus, and periods of constipation are also common, but severe abdominal pain, profuse bleeding, fever, and weight loss are not part of the spectrum of mild disease.
Moderate	Frequent loose, bloody stools (>4 per day), mild anaemia not requiring blood transfusions, and abdominal pain that is not severe. Patients have minimal signs of systemic toxicity, including a low-grade fever. Adequate nutrition is usually maintained, and weight loss is not associated with moderate clinical disease.
Acute Severe Colitis	Typically have frequent loose, bloody stools (≥6 per day) with severe cramps and evidence of systemic toxicity as demonstrated by a fever (temperature ≥37.8°C), tachycardia (HR ≥90 beats/minute), anaemia (haemoglobin <10.5 g/dL), or an elevated ESR or CRP (≥30 mm/hour). Patients may have rapid weight loss.

What could go wrong? *These are the complications of colitis*

Bleeding	Bleeding may be severe in up to 10 per cent of patients. Massive haemorrhage occurs in up to 3 per cent of patients and may necessitate urgent colectomy
Toxic megacolon	Fulminant colitis => 10 stools per day, continuous bleeding, abdominal pain, distension, and acute, severe toxic symptoms including fever and anorexia. Toxic megacolon = colonic diameter ≥6 cm or cecal diameter >9 cm and the presence of systemic toxicity
Perforation	Commonly occurs as a consequence of toxic megacolon. Perforation with peritonitis has been associated with 50 per cent mortality in patients with ulcerative colitis

Management algorithms

The great majority are managed symptomatically with drugs targeted to the cause of colitis, typically either antibiotics or immunosuppression. Colitis is managed primarily by medical gastroenterologists in conjunction with a surgeon

The key role of the surgeon is to identify the patients at risk of colonic perforation (i.e. patients with toxic megacolon) and ***operate them BEFORE a perforation occurs.*** This would typically mandate a total or

subtotal colectomy, with an ileostomy. Patients with acute severe colitis can look surprisingly well but have a high risk of perforation. The management of these patients is challenging and the decision to operate is difficult. Patients with acute severe colitis should be managed in a tertiary hospital setting or at least in consultation with a medical gastroenterologist.

The decision to intervene requires early referral to surgery, regular clinical examinations by the same team, senior clinical input, and much judgment. Patients on immunosuppression are particularly challenging, as the clinical signs of pyrexia, and peritonism can be masked by the medications.

CHAPTER 14. Doctor, I have a pain in my backside! An approach to acute perianal pain

Eugenio Panieri & Adam Boutall

Context: casualty or OPD

Introduction

Perianal pain is a common reason for a visit to the emergency department. Most causes of such pain are unpleasant for the patient, but seldom life-threatening.

There is no substitute for a sound approach and thorough evaluation of such cases. Almost all cases can be confidently diagnosed on clinical grounds alone, and do not require extensive investigations. So, as always, apply your mind and **MAKE A CLINICAL DIAGNOSIS**!

Patients will almost always refer to any perianal symptom as caused by “piles” or “haemorrhoids”. In reality, haemorrhoids are an uncommon cause of perianal pain, and another diagnosis is usually responsible for the patient’s symptoms.

Similarly, casualty officers referring patients to the surgeon on call seldom examine the perineum and anal region thoroughly and will label the patients with a cursory “surgical” diagnosis to get you (the surgeon) to sort it out. So don't rely on the referral diagnosis either, it is often incorrect.

Try to decide if this is a brand new symptom, or if it reflects a progression of long-standing disease. Importantly, try to decide just how bad the pain is.

Differential diagnosis:

Causes of severe “excruciating” perianal pain

Common	Rare	Don't want to miss
Perianal or ischiorectal abscess Fissure in ano	Acutely prolapsed thrombosed haemorrhoids Herpes simplex Anal trauma Severe proctitis Entero-vaginal fistula	Necrotizing fasciitis (Fournier's gangrene)

Causes of moderate perianal "discomfort"

Common	Rare	Don't want to miss
Perianal fistula Thrombosed varix or "perianal haematoma" Condylomata acuminata Proctalgia fugax	Prostate abscess Crohn's disease of perineum Severe hidradenitis suppurativa Anal prolapse	Anal carcinoma or a low rectal Cancer invading the sphincters

Flags for uncommon diagnoses*: the clinical context & co-morbidity may alert you to some less common pathology- just think about them!*

Diabetic	Perianal & ischiorectal abscess or necrotising fasciitis
HIV +	TB abscess, lymphoma, rectal Kaposi, condylomata acuminata, "vanishing perineum syndrome"
Anaemia & Cachexia	Anal cancer, Crohn's disease, TB
MSM	Anal trauma, herpes, condylomata
Elderly	Rectal prolapse
Infant, child	Constipation and fissure in ano, consider sexual abuse in unusual cases
Pregnant or postpartum	Grade IV haemorrhoids
Recent pelvic radiotherapy	Radiation proctitis
Inflammatory bowel disease	Perineal Crohn's fistulae, with "watering can" perineum

The diagnosis always rests on a thorough evaluation of the patient and a comprehensive examination of the perineum. This should be performed in a private space, with adequate illumination, and instrumentation to examine to anal canal and rectum.

Many patients with severe pain are unable to tolerate even a digital examination, they should undergo a "EUA"- examination under anaesthesia, as an urgent step, or be comprehensively examined once the pain subsides.

Clinical clues to the common diagnoses

Diagnosis	History	Clinical findings
Fissure in ano	The hallmark symptom is severe pain on passing stool Pain often lasts for hours following defecation. Fissures can also be associated with limited anal bleeding/spotting	Longitudinal tear in the anoderm that usually extends no more proximally than the dentate line acute fissure = fresh, superficial laceration Chronic fissure = raised edges exposing the white, sphincter muscle fibres; often accompanied by external skin tags (sentinel pile). The patient does not tolerate a PR exam
Perianal or ischiorectal abscess	Severe constant pain in the anal or rectal area; not necessarily associated with a bowel movement. Fever is common. Purulent rectal drainage may be noted if the abscess has begun to drain spontaneously	fluctuance and/or erythematous, indurated skin. Patients with a deeper (eg, supra levator) abscess, may not have any physical findings on external examination, and the abscess can only be felt via digital rectal examination under EUA
Perianal fistula	Perianal discomfort, and intermittent drainage of pus/ fluid into the underwear. Severe pain may be present if associated with an acute abscess. The previous history of a perianal abscess is common	Draining sinus anywhere in the circumference of the anal margin. The drainage from the fistula tract can be purulent
"Perianal haematoma"	Sudden onset pain, rapidly increasing in severity up to a persistent throbbing pain at 48 to 72 hours. This is not a haemorrhoid and can be treated with local drainage of the blood clot	Obviously, tender lump is present at the anal margin. It is covered by stratified squamous epithelium, is bluish and has a soft rubber consistency
Proctalgia fugax	Attacks of severe anorectal pain that may last from a few seconds to minutes, with an average duration of five minutes. Patients are asymptomatic between	Normal examination

	episodes	
Condylomata acuminata	The sensation of perianal mass and discomfort. If in severe pain, consider another cause!	Multiple soft, smooth or papillated papules or plaques limited to the anogenital area
Acutely prolapsed and thrombosed haemorrhoids	Presents with severe pain. Oedematous shiny “bunch of grapes” protruding from the anus	This will settle with good analgesia over a period of +/-10 days. There is no role for incision and drainage and surgery is almost never needed

Evaluation priorities

The only diagnosis that needs URGENT intervention is drainage of an abscess or debridement in a case of suspected necrotizing fasciitis.

If your working diagnosis is one of these two conditions, a patient needs admission to hospital and an urgent EUA & treatment plan.

All other conditions are treated on their merits, usually conservatively at first; the details depend on the diagnosis.

Expensive perineal imaging (like an MRI) is at the discretion of colorectal consultants only, and is best done AFTER a proper EUA is performed.

CHAPTER 15. Doctor, my leg is very sore! An approach to the acutely painful limb

Eugenio Panieri

Context: casualty

Introduction

Sudden onset of severe pain in a limb is uncommon and should alert you to a range of possible diagnoses. It is not "one of those things that gets better by itself". Apply your mind and make a rapid, accurate diagnosis; decide if urgent intervention is needed.

Try to decide if this is a brand new symptom, out of the blue, or if it reflects a progression of long standing disease. Is this an ***acute problem or an exacerbation of a chronic condition***?

DESCRIBE THE PAIN THOROUGHLY: define the presenting complaint

Location and radiation	*Where is it, and where does it radiate to?* In the foot, the calf, or the back of the thigh? Is it pain radiating along a neurological distribution?
Temporal elements	*The onset, frequency, and duration of the pain are helpful features* Is there a history of arterial or venoous or spinal claudication/
Quality	Is there any paraesthesia or dysaesthesia?- suggestive of neuropathy
Severity	*The severity of the pain generally is related to the severity of the disorder, especially if acute in onset* Excruciating= arterial occlusion, compartment syndrome high intensity= DVT moderate= cellulitis
Precipitants or ameliorating factors	*Identify what precipitates or improves the pain* Is there a history of trauma, or precedent claudication Can the patient bear weight? Inability to do this often implies either bone or joint pathology

ISSUES TO CONSIDER IN THE HISTORY: this allows you to consider other causes, and contextualise the patient's fitness for intervention

Cardio-respiratory symptoms	*Is the patient a vasculopath? Is there an arrhythmia or CCF?* cough, shortness of breath, orthopnea, exertional dyspnea, angina = pulmonary or cardiac origin of an emoblus?
Past medical history	Risk factors for DVT? Previous surgery or trauma? Any back surgery or connective tissue disease, or gout? Is the patient diabetic or HIV +ve?
Medication history	*Describe a comprehensive medication list, including over the counter medications*
Precipitants & other aetiological factors	Is the patient a smoker? Travel history= possible DVT Family Hx of hypercoagulable states

CLINICAL EXAMINATION

General examination	Pyrexia= cellulits edema= CCF, arrhythmia peripheral neuropathy signs of CT disorder, gout or arthropathy
vascular examination	*Does the patient have clinical signs of PVD?* Examine all pulses carefully, check blood pressure and do a proper cardiac evaluation Auscultate for bruits, and feel for irregular pulse rhythm-
limb examination	*Compare both limbs carefully* **Look**- erythema, pus or bullae, puncture marks, signs of PVD, scars or ulcerations, chronic lymphedema or pigmentation? Any areas of focal swelling, trauma or bruising? Is the leg swollen? If in doubt take a tape measure and compare the calf circumferences of each leg. Is there any tissue loss or frank gangrene? **Feel**- is it hot or cold? Is there focal tenderness to palpation in a specific compartment? is it edematous? Is there fluctuance or crepitus? Do the muscles feel soft and normal or woody and stiff? Is there a palpable mass? **Do a neurological evaluation of the limb**- is there movement? Signs of a peripheral neuropathy?

Evaluation priorities

How sick is the patient?	Do I need to start a resuscitation protocol? *Sometimes needed in severe sepsis or with major cardiac dysfunction*
How bad is the pain?	Give adequate analgesia, typically parenteral opiates
What is the diagnosis?	Most of the diagnoses are obvious clinically, with little need for extensive and complex investigations. When suspecting a vascular occlusion checking for blood flow with an arterial Doppler is extremely helpful
Does the patient OBVIOUSLY need an urgent intervention?	Whilst most common cause of limb pain are treated medically and can be evaluated within 24-48 hours, there a 3 less common conditions that need URGENT intervention: 1-acute arterial occlusion 2- compartment syndrome 3- necrotisng fasciitis. An acutely ischaemic limb is critically urgent- if blood flow is not re-established within 4-6 hours the chances of major morbidity or limb loss are high. ! Get on with it! Alert your seniors.

Differential diagnosis

Common causes:

	Clinical features	**SI**	**Urgent Surgery**
Cellulitis	1-2 days of pain and swelling, pyrexial red, swollen, hot limb	WCC++	No
DVT	short Hx, swelling, pain in back of the calf, swollen +++ may have risk factors for DVT	N WCC, +Ddimer, leg compression US	No
Chronic ischemia with tissue loss and sepsis	vasculopath or diabetic, tissue loss with osteitis or speading sepsis. Sensation may be absent due to longstanding neuropathy	Elevated WCC, x-ray foot may show osetitis and bone destruction	Yes, within 12-24 hours, typically amputation. A few may be candidates for vascular reconstruction

Don't want to miss:

	Clinical features	SI	Urgent Surgery
Acute arterial occlusion	Very short history, extreme pain. Cold , pulseless limb, usually from embolic cardiac source	Poor or no arterial flow on doppler. May have cardiac source of emboli	Yes- Immediate embolectomy
Compartment Syndrome	short Hx, usually post trauma or surgical. pain in muscle group, with tense swelling. Pulses usually present	Clinical diagnosis	Yes- urgent fasciotomy
Necrotizing infection	extreme pain, systemically very unwell, visible nectrotic tissue, crepitus	WCC +++, organ dysfucntion	Yes, urgent debridement
Septic arthritis	Extremely tender joint. Hot and swollen Unable to bear weight	WCC++++	Yes, urgent wash out

Less common diagnoses:

	Clinical features	SI	Urgent Surgery
Pathological fractures	Unable to bear weight. No or minor trauma. Bone disease	XR	No
Ruptured Baker's cyst	Pain and swelling back of calf, or popliteal fossa. Often misdiagnosed as DVT	US	No
Discogenic pain	Severe radiating pain into the leg or foot. Often worse when straining or changing position.	MRI	Usually mx conservatively. Surgery only with impending spinal cord compression
Gout/arthropathy	extremely tender JOINT- typically 1st toe, but may involve others, may have preceding episodes of gout	N WCC, elevated urate levels	No
Chronic osteitis	Long standing pain, with exacerbation. Sinus dicharging pus	XR or MRI reveals bone distruction	Elective surgery
Sarcoma	Bone sarcoma often have pain as the presenting symptom, before clinical signs are evident.	XR, MRI, biopsy	No, elective surgery after full work up

CHAPTER 16. Doctor, I have an ulcer on my skin! An approach to an open wound

Eugenio Panieri

Context: outpatients

Introduction: Surgeons are frequently asked to review or manage patients with wounds, particularly if they don't seem to be healing as expected. No matter where the problem is, there are **six questions** you need to explore when taking a history:

Where is it?	The clinical implications and differential diagnosis are very different depending on where it is! The great majority occur on the lower limb.
When and how did it come about?	Was this the result of obvious trauma, or a presumed "insect bite"? Is this a post-operative event or has it arisen spontaneously? When was it first noticed?
How has it changed since you first noticed it?	Has it got bigger, smaller, stayed the same size or has it come and gone? Has it changed its appearance and consistency?
What symptoms does it cause you?	Is it painful? Does it cause any other symptoms? Is there a discharge of pus or fluid?
Have you got any more/had it before	If the patient has more than one skin ulcer, are they the same? If the patient has had this before, what happened to it the last time, and what did the doctor say it was?
What medical conditions do you have?	Are the patients immunocompromised, diabetic, malnourished? Is there vascular or connective tissue disease? Has the patient event been diagnosed with cancer or received radiotherapy?

Differential diagnosis

A practical consideration is to divide the causes in “medical” and “surgical” conditions.

The great majority of non-healing ***“surgical” ulcers*** are seen in the lower limb, but they may occasionally present at other anatomical sites, and the common causes to consider at different sites are listed below.

	Common	Don’t want to miss
Face/ Neck	Skin carcinoma (BCC, squamous, melanoma)	TB sinus
Axilla	Hidrenitis suppurativa	TB sinus
Breast	Periductal mastitis	Breast cancer, TB
Perianal region	Veneral disease perianal fistula	anal cancer
Sacrum	Pressure ulcer Pilonidal sinus	
Abdominal wall	Wound infection	Intestinal fistulae

Lower limb ulceration

90% of leg ulcers are due to either arterial, venous or neuropathic conditions, the latter almost always in diabetic patients. Neuropathic ulcers and arterial disease often co-exist, particularly in diabetics, and render their management very complex.

Common causes

	Site	Appearance	Other clinical features
Ischaemic ulcer	Tips of the toes or on pressure areas (Heel malleoli and shin)	Well-demarcated edges, giving them a "punched-out" appearance, often with an overlying necrotic eschar, arterial ulcers typically are very painful	Thin atrophic legs, absent pulses, early tissue loss, smokers
Venous ulcer	Above the medial malleolus	Ulcers are typically shallow with irregular borders with yellow, fibrinous exudate overlying the wound bed. Pain is mild to moderate	Normal pulses. Often swollen legs with signs of chronic venous insufficiency (telangiectasias, peripheral oedema, venous varicosities, lipodermatosclerosis)
Neuropathic	Pressure points on the foot or heel.	Ulcers have a punched-out morphology and typically occur within a thick callus. Painless	Diabetic neuropathy =claw toes, neuropathic (Charcot) arthropathy, and reduced sweating resulting in dry, scaly feet

Occasional scenarios

Trauma	Pressure injuries, burns, radiation exposure, brown button spider bites, dog bites, iatrogenic injury or self-induced injury	Varied appearance, the common site is the anterior shin, which is very slow to heal in elderly patients. Appearance varies from shallow open ulcers to deep ulcers that expose bone, tendon or muscle
Infections	Staph aureus, impetigo, furuncles Chronic osteitis	Poor hygiene, multiple flea or insect bites Previous trauma, non-healing fracture, purulent sinus discharge

Very uncommon scenarios

Malignancy	Long standing ulcers can undergo squamous malignant change: "Marjolin ulcer" Advancer sarcomas may ulcerate	Rolled prominent edges, with chronic exudate, increasing in size Ulcer with large underlying mass
Weird infections	Atypical mycobacterial, late-stage syphilis (gummas), deep fungal infections (e.g., coccidiomycosis, blastomycosis, histoplasmosis) and protozoal infections (e.g. leishmaniasis)	Unusual history of travel, immunocompromised patient
Medical causes	Systemic disease/dermatological conditions	

Remember that some systemic medical conditions may have unusual dermatological components! None of these are common, but you need to remember that they exist, and think of them in atypical cases.

Medical causes of skin ulceration

	Associated condition	*Typical clinical feature*
Vasculitis	Infections, drugs, mixed cryoglobulinemia, autoimmune disorders (SLE, rheumatoid arthritis, Sjögren syndrome), or hematologic malignancies.	Palpable purpura may develop an overlying necrotic vesicle or bulla that becomes ulcerative.
Microvascular occlusion disorders	Associated with cryoglobulinaemia, oxalosis, calciphylaxis in secondary hyperparathyroidism	Cutaneous ulcerations , typically are very painful and retiform purpura
Pyoderma gangrenosum	Inflammatory bowel disease, arthritis, or hematologic disease	Single or multiple rapidly progressive painful leg ulcers with necrotic borders and surrounding erythema. The initial clinical finding is a pustule, which then develops an overlying necrotic bulla that ulcerates with purulent drainage
Drug reaction	Warfarin, heparin, hydroxyl-urea	Pain is the initial symptom, followed by erythema, which then becomes haemorrhagic and necrotic. Retiform purpura may be adjacent to sites of skin necrosis
Panniculitis	Associated with a pancreatic disease, alpha1 antitrypsin deficiency	inflammation of the subcutaneous fat, followed by ulceration

What is the diagnosis?

In almost all circumstances the diagnosis of the ulcer is very obvious on clinical grounds alone and does not require formal investigations.

Occasionally a biopsy of the ulcer edge is performed to exclude malignancy; tissue culture or pus swabs can be done to look for unusual infections.

In practice most tests are aimed at evaluating the severity of the underlying cause, and what can be done to treat that condition.

	Investigations	Intervention	Natural history
Ischaemic ulcer	Evaluate co-morbidity Arterial doppler Duplex doppler/angiography	Bypass, endovascular intervention vs limb ablation	will never heal unless ischemia is corrected
Venous ulcer	Venous dopplers exclude arterial disease	Local hygiene, long term compression bandaging Venous surgery occasionally helpful	An indolent, relapsing course
Neuropathic	Evaluate concomitant arterial disease.	Optimise diabetic Mx Unload pressure area Treat ischaemia May need debridement or ablation	Problematic, healing is uncommon

Help! The ulcer/ wound isn't healing as expected! What is going on?

All wound heal, in well-nourished healthy individuals, irrespective of the dressings done to facilitate it. Time heals.

However, some patients fail to match the clinical expectation and have persistent, open wounds. In these cases consider two key factors:

- What is the underlying diagnosis (cause of the ulcer)? Am I treating this cause correctly? Am I missing something?
- Are there local or systemic factors that are delaying the healing process?

Local factors	Systemic factors
Local ischaemia	Malnutrition
Chronic sepsis	Immunocompromise (diabetes, Cushing's, HIV)
Entero-cutaneous fistula or chronic sinus	Drugs (steroids, chemotherapy, immune suppressant drugs)
Retained foreign body	Connective tissue disease
Radiotherapy	Ageing
Malignancy	Immobilization
Anatomy (certain sites like the heel or anterior tibial skin are very slow to heal)	Smoking
Repeated trauma or friction	Oedema (CCF, CRF, liver failure)
Fictitious/ patient interference	Chronic hypoxia (COPD)

CHAPTER 17. Doctor, I have a lump ! An approach to a soft tissue mass

Eugenio Panieri

Context: outpatients

Introduction: Surgery OPD is full of patients who present with lumps. No matter where the lump is, there are **six questions** you need to explore when taking a history:

Where is it?	The clinical implications and differential diagnosis are very different depending on where it is!
When and how did you first notice the lump?	Was it noticed incidentally, whilst looking in the mirror, or did the patient's partner point it out? When was it first noticed?
How has the lump changed since you first noticed it?	Has it got bigger, smaller, stayed the same size or has it come and gone? Has it changed its appearance and consistency?
What symptoms does it cause you?	Is it painful? Does it cause any other symptoms? Symptoms usually are related to the anatomical site
Have you got any more/had it before	If the patient has many lumps, are they the same? If the patient has had this before, what happened to it the last time, and what did the doctor say it was?
What do you think it is?	Most patients worry that this could be cancer. You have to aware of the patient's concerns if you want to be able to reassure them

Differential diagnosis:

	Common	Don't want to miss
Neck	Lymphadenopathy sebaceous cyst	Thyroid and ENT cancer, lymphoma
Axilla	Lymphadenopathy abscess	Breast cancer
Breast	Breast cancer Fibroadenoma Abscess	Breast cancer
Groin	Hernias Lymphadenopathy Abscess	Incarcerated hernia Aneurysms
Perianal region	Abscess Prolapsed haemorrhoids	Rectal cancer Necrotising sepsis of the perineum
Thigh/ buttock	Lipoma	Sarcoma

Each of these anatomical sites will be explored further

CHAPTER 18. Doctor, I have a lump in my neck! An approach to a neck mass

Eugenio Panieri, Francois Malherbe & Lydia Cairncross

Context: outpatients

Introduction: by far the most common cause of a neck mass is lymphadenopathy. Salivary gland pathology presents to ENT clinics, and thyroid enlargements are also common. The neck can also be a site of other "benign" swellings, such as lipomas, sebaceous cysts, dermoid inclusion cyst.

The patient's age and clinical context is also obviously very important- a higher proportion of neck masses in children are reflective of congenital lesions (cystic hygroma/ branchial cyst/ thyroglossal cyst/ haemangiomas etc), whereas in the elderly metastatic lymphadenopathy is much more likely. In adulthood the usual differential is between TB, lymphomas, salivary gland pathology and thyroid enlargement.

Ask the patient to point towards the "lump" early in the consultation- you can easily tell from the other side of the desk if the patient has a thyroid mass or a more lateral mass, and this will guide your history taking further.

Differential diagnosis

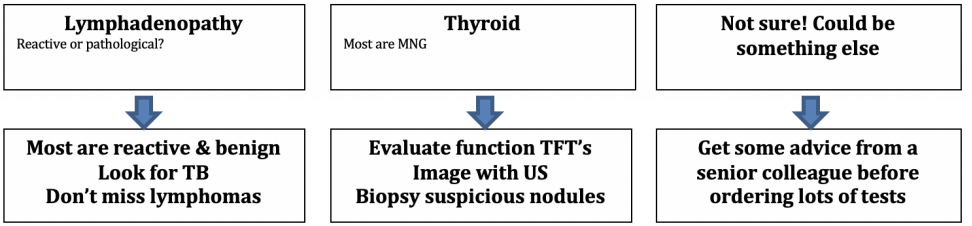
Common	Clues
Lymphadenopathy	Usually short history, with mild tenderness. Common site along jugular chain/ lateral zone of the neck or posterior triangle Does not move on swallowing. Usually more than one node.
Thyroid enlargement	More central location, moves visibly on swallowing, lower 1/3 of the neck just superior to the sternal notch
Benign skin condition, ie sebaceous cyst (or lipoma/epidermoid inclusion cysts/ dermoids cysts)	Common in hairline areas of the neck. Characteristic punctum and sebum on pressure. Recurrent infection
Salivary gland enlargement	Submandibular gland is typically palpable bimanually Parotid enlargement moves the earlobe forward
Uncommon and weird	
Cystic hygroma/ Branchial cyst Haemangioma/vascular anomaly	Commonest in childhood or early adulthood
Carotid body tumour/ Schwannoma Sarcoma Laryngocele	Feels like an isolated LN in area of carotid bifurcation Hard mass within sternocleidomastoid muscle Bulges out on valsalva pressure
Don't want to miss	
Malignant lymphadenopathy	Look for occult primary sites in the floor of mouth and in the thyroid

The key clinical question is: is this a midline neck swelling (thyroid) or a lateral neck swelling (lymphadenopathy)?

	Thyroid	Lymph Node
Duration	Often long-standing	increasing size
Pain	nil	Tender if caused by sepsis
Predisposing factors	Family history	Reactive to URTI, dental sepsis, pharyngitis Metastatic from local or distant primary carcinomas
Size	Variable, but can be massive	Usually 1-3 cm, often more than one LN enlarged
Consistency	firm	firm
Location	Midline lower 1/3 Moves with swallowing	Lateral Does not move on swallowing

LUMP IN THE NECK ALGORITHM

THINK	DO	PLAN
what is the aetiology? could this be a cancer? Children- congenital anomalies Adults- TB, lymphoma, salivary glands, thyroid Elderly- LN metastases	Ask a senior colleague to examine the case with you Make a diagnosis clinically Use US selectively CT/MRI very rarely needed	Refer cases of diagnostic uncertainty



CHAPTER 19. Doctor, I have a swollen lymph node in my neck! An approach to cervical lymphadenopathy

Eugenio Panieri, Francois Malherbe & Lydia Cairncross

Context: outpatients

Introduction: by far the most common cause of a neck mass is lymphadenopathy, across all age groups. Most cases represent reactive enlargement to recent upper aerodigestive tract infections, and some do not have an overt precipitating cause. Occasionally the neck lymph nodes are markers of more systemic illness (such as HIV, infectious mononucleosis, sarcoidosis, etc).

Decide clinically if the mass you feel is an enlarged lymph node or not. It is seldom necessary to order US imaging to confirm this. Always examine the patient thoroughly, look for generalized lymphadenopathy, splenic-, and hepatomegaly. Examine the breasts in women. Look for subtle skin lesions, and examine the floor of the mouth and the teeth.

The key clinical decision is to consider if the patient's lymphadenopathy is reactive (benign and self-limiting) or pathological. The former is of little relevance, whereas pathological lymph nodes need urgent investigation.

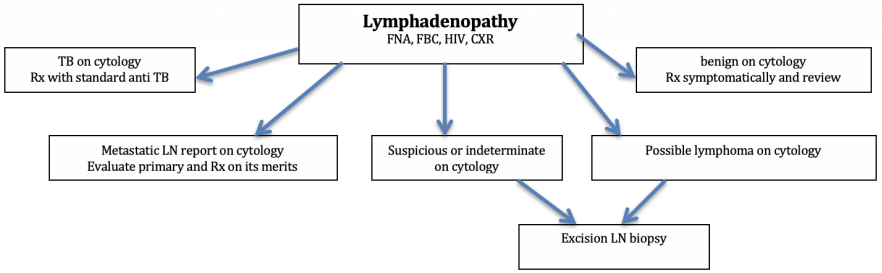
	Pathological	**Reactive**
Duration	Persistent	Short history
Pain	Nil	Tender
Predisposing factors	Systemic symptoms, LOW, hoarseness	Reactive to URTI, dental sepsis, pharyngitis
Size	Large>2cm	Usually <2 cm, often more than one LN enlarged
Consistency	Firm, matted, fixed, rubbery	Tender, mobile

Differential diagnosis in pathological cervical adenopathy seen in a surgical clinic:

Incidence	Clues
TB (65%)	Matted, fixed, may discharge greyish pus or have chronic sinus Systemic symptoms, chronic cough, HIV+
Lymphoma (15%)	Large, rounded rubbery nodes May have Type B symptoms
Metastases (15%)	Primary sites are ENT cancers, thyroid, melanoma, GIT, lung, breast
Systemic disease (<5%) (infective/ non infective)	HIV/ EBV/ Brucella/Toxoplasmosis/CMV/histoplasmosis/coccidiomycosis Sarcoidosis / Castleman disease

LYMPHADENOPATHY ALGORITHM

THINK	DO	PLAN
what is the aetiology? could this be a cancer?	FNA cytology (this is the most important test) FBC, HIV, CXR	Refer cases of diagnostic uncertainty



CHAPTER 20. Doctor, I have a lump in my neck, I think my thyroid gland is swollen! An approach to thyroid enlargement

Eugenio Panieri, Francois Malherbe & Lydia Cairncross

Context: outpatients

Introduction: most masses in the lower 1/3 of the neck, located between the sternocleidomastoid muscles, and below the level of the thyroid cartilage are thyroid enlargements. Ask the patient to swallow- if the mass moves visibly, it confirms that it is of thyroid origin. It is important however to remember that (rarely) other pathology may also occupy this anatomical space.

Thyroid enlargement	Accounts for 95% - central or on either side of the trachea, moves on swallowing
Thyroglossal cyst	Superior to tracheal cartilage, just on either side of the midline, moves on protrusion of the tongue (embryological attachment to foramen caecum of the tongue)
Pre-tracheal lymph nodes	Typically metastatic thyroid carcinoma nodes (Delphian nodes)
Plunging ranula (salivary gland cyst)	This is a floor of mouth condition- bimanually palpable, transilluminates. Mostly seen in ENT

Ask about symptoms suggestive of thyroid dysfunction (hypo- and hyperthyroidism), symptoms of local compression, and family history of thyroid and other endocrine illnesses.

On clinical examination, it is simple to decide if the mass you see and feel is thyroid in origin. A normal-sized thyroid is not palpable nor is it visible, even in very thin individuals- thus the presence of a thyroid mass equates with enlargement, usually caused by a pathological process. A subtle thyroid enlargement is better SEEN than palpated: always ask the patient to swallow and inspect the neck from 2-3 meters (the usual distance if you are consulting across a desk). Consider if the thyroid is symmetrically enlarged (i.e. can you feel both lobes= goitre) or if the only abnormality is a one-sided enlargement (solitary nodule). Evaluate if there is associated lymphadenopathy, airway deviation and retrosternal extension of the mass. Look for clinical signs of thyrotoxicosis and hypothyroidism.

Because the clinical evaluation of thyroid form and function is subjective, it is routine to order a neck US and blood tests to evaluate thyroid function.

Causes of thyroid enlargement/thyroid function and clues to the aetiology

	Abnormalities of function			
		Hypothyroid	**Euthyroid**	**Hyperthyroid**
Abnormalities of form (shape)	**Smooth goitre**	Thyroiditis	Physiological goitre	Grave's disease Thyroiditis
	Nodular goitre	Hashimoto's thyroiditis MNG	MNG	Toxic MNG
	Single nodule/unilateral	Uncommon scenario	Hyperplastic nodule Cyst Adenoma Carcinoma	Toxic adenoma

Differential diagnosis of thyromegaly seen in a SA thyroid clinic

Incidence	Clues
MNG (70%)	Can be massive in size, usually bilateral lobes involved Most commonly euthyroid, but over time drifts towards hypothyroidism
Hyperplastic nodule (20%)	The commonest cause of single thyroid nodule
Graves/ Hashimoto's thyroiditis (5%)	Present with thyrotoxicosis or hypothyroidism Thyroid enlargement moderate in volume
Carcinoma(5%)	Typically presents with single thyroid nodule suspect if lymphadenopathy, voice changes, recent increase in size

THYROMEGALY ALGORITHM

THINK	DO	PLAN
What is the thyroid shape and size? Is there airway compression? Is the patient thyrotoxic or euthyroid? what is the aetiology? could this be cancer?	US examination FNA cytology (of single nodule or suspicious nodule within an MNG, do not bx if <1cm) TFT's Thyroid antibodies in cases of suspected thyroiditis	Review with a surgical colleague

Features to look for in Ultrasound evaluation of thyroid nodules

Calcifications	Echogenicity	Colour doppler	Other	Lymph nodes
microcalcifications punctate echogenic foci without posterior shadowing most specific finding associated with malignancy (~95%) [2] **coarse calcifications** can be seen in both benign and malignant nodule **peripheral rim calcification** seen in both benign and malignant nodules	**hypoechoic** solid nodule most papillary thyroid carcinomas nearly all medullary thyroid carcinomas benign nodules can be hypoechoic **isoechoic** solid nodule: 25% (follicular and medullary) **hyperechoic** solid nodule: 5% chance of being malignant large cystic component favours a benign entity	**intranodular flow** usually malignant **lymph nodes with increased colour Doppler** flow are suspicious	**invasion of local structures** favors anaplastic thyroid carcinoma and thyroid lymphoma **shadowing around the edges of a nodule** associated with papillary thyroid carcinoma **a nodule taller than it is wide** is suspicious for malignancy **irregular margins** are suspicious for malignancy	**enlarged regional lymph nodes** are suspicious for thyroid malignancy, esp. papillary thyroid carcinoma **microcalcifications in regional lymph nodes** are highly suspicious **lymph nodes with cystic change** are highly suspicious **loss of normal fatty hilum, irregular node appearance** **increased colour Doppler** flow is suspicious

Features of a benign nodule	Features of a malignant nodule
• Large cystic component • Hyperechoic solid • Comet tail artefact • Small	• Hypoechoic solid • Presence of microcalcifications • Local invasion of surrounding structures • Taller than it is wide • Large size > 2,5cm • Suspicious neck lymph nodes suggesting metastatic disease • Intranodular blood flow

Bethesda cytological reporting of thyroid nodules

	Finding	Risk of malignancy	Treatment decision
1	Inadequate	n/a	Repeat biopsy
2	Benign	0-3%	Reassure
3	Atypia, indeterminate	5-15%	Repeat biopsy in 6 months
4	Follicular neoplasm or suspicious	15-30%	Lobectomy
5	Suspicious for malignancy	60-75%	Lobectomy or total thyroidectomy
6	Malignant	97-99%	Lobectomy or total thyroidectomy

CHAPTER 21. Doctor, I have a lump on my leg! An approach to a soft tissue mass

Eugenio Panieri, Lydia Cairncross & Francois Malherbe

Context: outpatients

Introduction: most of these patients will have a benign soft tissue neoplasm

Differential diagnosis

Common	Clues
Lipoma	Long standing, painless, minimal change in size
Uncommon and weird	
Haematoma/ Retained foreign body False aneurysm Seroma Cold abscess Hydatid	History of trauma Hx of penetrating injury in recent past/ bruit or thrill on examination Major soft tissue injury/ degloving injury Medial thigh/ frail TB patient/ typically painless Contains clear fluid only
Don't want to miss	
Sarcoma	Often has no other symptoms at all Typically faster growing than lipoma, and firm in consistency

Benign soft tissue masses are at least 100 times more common than sarcomas
The key clinical question is: is this a lipoma or a sarcoma?

	Lipoma	Sarcoma
Duration	Minimal change over years	Increasing size
Pain	Nil	in late-stage only
Predisposing factors	Nil	Neurofibromatosis HIV+ (Kaposi) Previous radiotherapy
Size	mostly small	Can be large
Consistency	Soft "fatty"	Firm
Location	Superficial	Intramuscular/deep

Lipoma

These are soft, fatty neoplasms which most typically occur in the subcutaneous tissues. They have an indolent history, and will not cause local symptoms, other than mild discomfort. Management is conservative unless they are large or unsightly, in which case a local excision is curative. **The diagnosis can be made on clinical grounds in the majority of cases**. If you are not sure, before starting many expensive investigations, ask a senior colleague to examine the patient.

The following patients meet criteria for urgent referral with a soft tissue lesion:

- Soft tissue mass >5 cm
- Painful lump
- A lump that is increasing in size
- A lump of any size that is deep to the muscle fascia
- Recurrence of a lump after the previous excision

Sarcoma

Diagnosis and staging are best done with the guidance of the surgical oncology unit responsible for the care of the patient, and for practical purposes, a patient with a suspected sarcoma must not have biopsies attempts prior to referral.

Aspiration cytology may be helpful in excluding haematomas and abscesses but is inadequate in obtaining the finite diagnosis of sarcoma.

The diagnosis can only be made by obtaining a generous amount of tissue for histological evaluation.

Needle core biopsy is the preferred method of diagnosis. On certain occasions, incision or excision biopsy is used, particularly for small (<5cm lesions), but the route must be able to incorporate the final excisional area should the lesion be a sarcoma.

Staging is performed by an MRI scan of the area in question, together with a CT of lungs and liver (a CT of the lungs may reveal metastases not shown on a radiograph). A liver enzyme profile is performed to determine hepatic metastatases.

Combined Assessment: Patients are best managed by a multi-disciplinary team comprising of an oncology surgeon, orthopaedic surgeon, pathologist, oncologist and radiologist. Extensive patient counselling is essential.

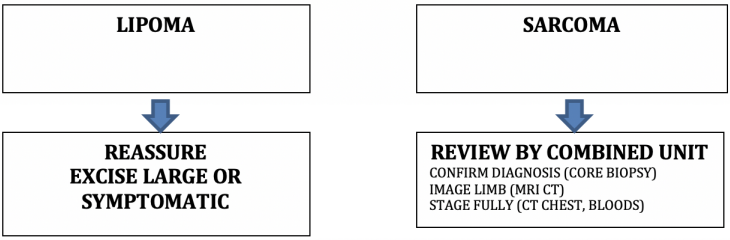
Real problem:
The biopsy is inadequate:

- get senior help
- Re-biopsy
- Consider a US-guided biopsy
- Consider open incisional biopsy

Never do a sarcoma operation without histological diagnosis!

SOFT TISSUE LUMP ALGORHYTHM

THINK	DO	PLAN
what is the aetiology? could this be a sarcoma?	Ask a senior colleague to examine the case with you	Refer any s**oft tissue mass >5 cm** ●Painful lump ●Lump that is increasing in size ●A lump of any size that is deep to the muscle fascia ●Recurrence of a lump after previous excision



CHAPTER 22. Doctor I have a lump in my groin! An approach to a hernia

Eugenio Panieri

Context: outpatients/ sometimes in the Emergency Room

Introduction: most of these patients will have an inguinal hernia

Differential diagnosis

Common	Clues
Inguinal hernia	Intermittent bulge, reducible, +ve cough impulse
Lymphadenopathy	Associated with leg or genital sepsis/ other causes of adenopathy
Uncommon and weird	
Femoral hernia	Typical in elderly females, just below the inguinal ligament
Haematoma	History of trauma
False aneurysm	Hx of penetrating injury in recent past/ bruit or thrill on examination
Cold abscess	Medial thigh/ frail TB patient/ typically painless
Lipoma of the cord	Can be difficult to differentiate from inguinal hernia
Sarcoma	Hard mass in the groin region
Retractile/ undescended testis	Firm mass in the inguinal canal
Don't want to miss	
Incarcerated hernia	Fixed mass, tender, may have associated bowel obstruction

The common clinical question is: is this a hernia or lymphadenopathy?

	Hernia	Adenopathy
Duration	Often many months, or years	Recent onset
Pain	Nil, but can be uncomfortable and have episodes of severe pain	Constant in cases caused by infective conditions
Predisposing factors	More common in men Sudden onset after exertion Smokers, COPD	Limb trauma, sepsis Associated venereal disease Neoplasm in the limb
Size	Range from intermittent and small to massive intra-scrotal hernias	Usually small to moderate in size
Consistency	soft "fatty", +ve cough impulse, extends into the scrotum	Firm, multiple, rubbery
Location	Usually at the external inguinal ring	Medial to femoral vessels, and below the inguinal ligament

Hernias

The diagnosis can be made on clinical grounds in the majority of cases.

- If you are not sure, before starting many expensive investigations, ask a senior colleague to examine the patient.
- A symptomatic hernia is defined as a hernia causing groin discomfort/ pain at rest or when moving, or mass interfering with normal activity.
- Asymptomatic, incidental or minimally symptomatic inguinal hernias may be safely observed, and need not be referred to SOPD.
- Femoral hernias should be repaired, as their incidence of strangulation is significantly higher.
- There is no role for routine imaging tests to confirm the diagnosis of a hernia

CHAPTER 23. Doctor, I have a lump in my breast! An approach to a breast mass and other common breast complaints

Eugenio Panieri, Francois Malherbe & Lydia Cairncross

Context: outpatients

Introduction: the central clinical question is whether the lump is breast cancer or not. Since breast cancer is the commonest cancer to affect women in most countries, this is a frequent scenario.

History taking is aimed at identifying symptoms suggestive of a benign breast lump and evaluating the patient's risks for breast cancer. Take a careful gynaecological history as well.

The most powerful risk factors for the development of breast cancer are age (postmenopausal), gender (women!obvious!), previous breast carcinoma or predisposing breast pathology (DCIS/LCIS/ atypical ductal hyperplasia), a family history of breast or ovarian carcinoma, and previous radiotherapy to the chest wall.

Undress the patients, and examine systematically both breasts, the axillae and the supraclavicular fossa. Use the palm of your hand (not your fingertips) and evaluate for lumps, tenderness, adenopathy; look for signs of skin dimpling, ulcerations, skin oedema, or fixity.

More than half of all patients who present with a breast lump have a normal examination (i.e. they don't have a lump!)- the breasts are markedly variable in consistency and nodularity, and some patients and less experienced clinicians can over-interpret normal breast consistency.

The patient's age and clinical context is critically important- the older the patient, the more likely the diagnosis of breast cancer. A number of benign conditions occurring elsewhere (such as lipomas, sebaceous cysts) can also cause breast lumps.

Clinical findings on breast examination

Normal	Clinical findings vary enormously depending on patients' age, pregnancy status, adiposity. The upper outer quadrant and the infra-mammary fold are areas of increased breast density, which is normal. Young women have much more dense, "nodular" breast tissue.
Thickening	Area of increased breast density, which is different from the surrounding tissue and is asymmetrical, but is not as clearly defined as a breast lump. If you were to excise it, you would struggle to define its exact extent and may remove a large area.
Lump	A localised swelling, protuberance, bulge or bump in the breast that feels different from the breast tissue around it or the breast tissue in the same area of the other breast. If you are to biopsy it, you would be able to exactly define where the lump ends and the normal parenchyma starts.
Skin dimpling	Best seen in a sitting position with the arms elevated- notice a small dimple in the skin overlying a breast lump- it is strongly associated with breast carcinoma- very few benign breast conditions cause dimpling
Nipple discharge	Spontaneous, persistent, blood-stained single duct discharge merits investigation. Bilateral, clear, non-spontaneous discharge is common and clinically irrelevant

Differential diagnosis of a breast lump

Common	**Clues**
Breast carcinoma	*Presents as a painless, firm lump.* *More overt signs (adenopathy, skin oedema, ulcerations)- occur in advanced cases.*
Breast cyst	*Perimenopausal patients, smooth lump, tender to pressure*
Fibroadenoma	*Adolescent and young patients, well defined, smooth very mobile mass*
Breast abscess	*Commonest in late pregnancy or breastfeeding/ usually obvious clinical diagnosis based on findings of erythema, tenderness, fluctuation, purulent discharge*
Periductal mastitis	*95% are smokers, causing chronic retro-areolar inflammatory masses and recurrent abscess and fistulae*
Fat necrosis	*Follows a traumatic event (direct injury i.e. seatbelt injury after MVA or assault)* *Can be very similar clinically to a breast carcinoma- hard, craggy, irregular*
Uncommon and weird	
TB	*Commonest in HIV+ patients, either as a chronic abscess / or with axillary adenopathy/sinus*
Galactocele	*In breastfeeding*
Phyllodes tumours	*Feels like a large fibroadenoma in an older patient, but can become enormous*
Metastases to the breast	*Melanoma or lymphoma can present with suspicious breast masses*
Don't want to miss	
Breast carcinoma	*Be absolutely sure that a "benign lump" is properly evaluated, and histology reports are representative*

Differential diagnosis of a breast lump in different clinical contexts

Context	*Diagnosis*	*Comments*
Adolescent	Fibroadenoma	*Breast cancer is exceedingly rare in this context.* *Young women have dense, nodular breasts which can be difficult to evaluate, this can lead to over-referral to breast clinics*
Pregnancy	Lactational abscess Galactocele Breast carcinoma	*Pregnant women have dense, nodular breasts which can be difficult to evaluate. Breast cancer can be easily missed in this context.* *Fibroadenomas can occur in this context, and typically hypertrophy during pregnancy*
Middle age	Breast carcinoma Cyst Fat necrosis Periductal mastitis	*In patients older than 40, breast cancer starts to be a probable diagnosis* *Fibroadenoma is very uncommon* *Look at benign diagnoses with "suspicion"& evaluate fully*
Elderly	Breast carcinoma	*Almost all breast lumps in this age group are malignant*
Male	Gynaecomastia Breast carcinoma	*1% of breast cancer occurs in men* *gynaecomastia can be caused by drugs (spironolactone/ steroids/ ARV's) or liver failure*
HIV +	Breast carcinoma TB Lymphoma	*Consider TB and lymphoma is patients with marked adenopathy* *The most likely cause remains breast carcinoma*

Differential diagnosis of breast thickening

Common	*Clues*
Normal	*Bilateral symmetrical UOQ thickening*
Fibrocystic breast change	*Areas of fibro-cystic change can feel different to surrounding tissue. This is common in perimenopausal patients*
Carcinoma	*Carcinoma may be less easy to feel in breast parenchyma that is thick, and nodular* *Lobular carcinoma typically presents with ill-defined thickening, rather than a well-demarcated mass*
Periductal mastitis	*95% are smokers, causing chronic retro-areolar inflammatory masses and recurrent abscess and fistulae*
Don't want to miss	
Breast carcinoma	

Differential diagnosis of skin dimpling

Common	***Clues***
Carcinoma	*Most skin dimpling is caused by carcinomas, even small impalpable lesions*
Surgical scars	*Prior surgery can leave "gaps" of breast parenchyma that distort skin appearance*
Don't want to miss	
Breast carcinoma	*Look for occult primary lesions if nil palpable*

Differential diagnosis of nipple discharge:

Common	***Clues***
Intraductal papilloma	*Single duct, spontaneous blood-stained or clear serous discharge*
DCIS / carcinoma	*Single duct, spontaneous blood-stained or clear serous discharge* *Carcinoma may have an associated irregular mass or thickening*
Periductal mastitis	*Smoker, recurrent infections, usually a yellow purulent discharge from the nipple or peri-areolar fistula*
Ductal ectasia	*>1 duct, fluid can be dark green/ brown*
Don't want to miss	
Breast carcinoma	*Look for occult primary lesions if nil palpable.*

Differential diagnosis of breast pain

Common	***Clues***
Physiological mastalgia	*>95% of all cases of breast pain are physiological and do not correlate to any underlying breast pathology* *this is commonest in adolescent and around menopause but may occur at any age.*
Less common	*Focal, localized, persistent breast tenderness may reflect a local breast condition*
Breast abscess	*Obvious clinical diagnosis in almost all cases*
Fat necrosis	*On occasion, this can be tender*
Breast cyst	*A tender breast lump, in perimenopausal woman*
Fibroadenoma	*A small proportion can be tender to pressure, but most are asymptomatic*
Referred pain	*Costo-chondral tenderness typically just lateral to the sternum, on focal pressure= Tietze's syndrome* *Herpes zoster giving referred pain from dermatomal innervation* *Thrombosed vein within the breast parenchyma. On palpation, it feels like a tender "chord" of tissue- Mondor's disease*
Breast carcinoma	A locally advanced, ulcerated carcinoma can cause local pain. An impalpable or **early breast carcinoma is typically NOT painful**. If a patient has mastalgia AND breast cancer it is more commonly a coincidence, rather than cause and effect
Don't want to miss	
Breast carcinoma	*Examine patients thoroughly, and reassure about the benign nature of mastalgia* *Any clinical signs must be evaluated on their merits*

Breast diagnostics

Triple assessment is the gold standard for the evaluation of a breast mass: ie (1)clinical evaluation must be supported by appropriate (2)imaging and (3)tissue biopsy.

Always consider if the all 3 aspects of the assessment are concordant (in agreement) or discordant (don't make sense!)- The bottom line is: if the investigations are CONCORDANT (ie if clinical, biopsy and imaging features are malignant- the final diagnosis will be malignant, and conversely if clinically and all the investigations are benign then the diagnosis will be benign!) or DISCORDANT (i.e. the biopsy reports a malignant lesion, but the imaging looks benign, or vice versa) – discordant reports mandate either repeat investigations or surgery to clarify the diagnosis.

Imaging techniques

	Strengths	Weakness	False +ve	False -ve
Mammogram	Cheap Widely available Suitable for most patients	Radiation exposure Not ideal in patients with high breast density	<5%	5-10%
US	Cheap Widely available Can guide biopsies Useful in patients with dense breast tissue	Subjective/ operator dependent Can't see microcalcifications well	<5%	5-10%
MRI	Excellent quality imaging No radiation Suitable in all breast density	Very expensive Oversensitive Not widely available Use very selectively	10%	<5%

Be aware the a normal mammogram does not exclude cancer with 100% confidence- approximately 10% of malignancies are missed on imaging (10% false-negative rate)- never disregard a suspicious clinical sign, even if radiology is reassuring- a biopsy is a critical part of the "triple assessment".

Characteristic features of breast cancer on imaging

Mammography	Ultrasound
• Dense soft tissue mass/opacity • Spiculation • Architectural distortion • Pleomorphic microcalcifications • Adenopathy • Oedema of the skin	• Hypoechoic solid • Presence of microcalcifications • Taller than it is wide • Suspicious axillary lymph nodes suggesting metastatic disease • Intra-lesional nodular blood flow • Irregular edge

BI-RADS Classification: all reports should classify the findings according to the BI-RADS system

Assessment	**Management**	**Cancer probability**
1- negative	Follow up only if clinically indicated	0%
2-benign	Follow up only if clinically indicated	0%
3- probably benign	Review in 6/12 or routine screening (if indicated)	<2%
4- suspicious a- low suspicion b- intermediate suspicion c- high suspicion	Tissue diagnosis	 2-10% 10-50% 50%-95%
5- highly suggestive of malignancy	Tissue diagnosis	>95%
6- known biopsy-proven malignancy		n/a

Biopsy techniques

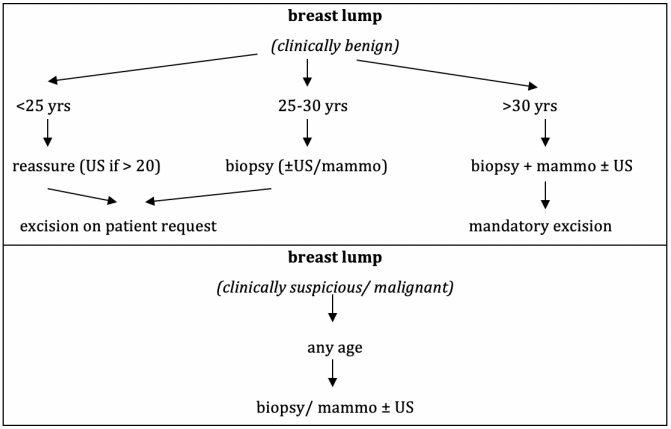
	Strengths	weakness	False +ve	False -ve
FNA cytology	Cheapest Widely available easy to learn can be done in consultation rooms	Inadequate sampling Cytology report only Cannot offer definitive treatment on the result Cannot distinguish infiltrating cancer from DCIS	<1%	5-10% (mostly related to sampling errors)
Needle core biopsy	**Gold standard** Not expensive Can be done in a consultation room Obtain a sample for histology examination	More complex to learn Needles 10x >expensive than FNA Lab costs greater	<0.05%	<5% if done correctly
Excision biopsy	Large volume of tissue obtained = representative	Expensive Requires procedure/theatre room hospital costs leaves a scar	<0.01%	<0.1%
Punch biopsy	Suitable for skin lesions only Cheap Histology examination	Limited clinical use to skin abnormalities only (i.e. Paget's disease of the nipple)		

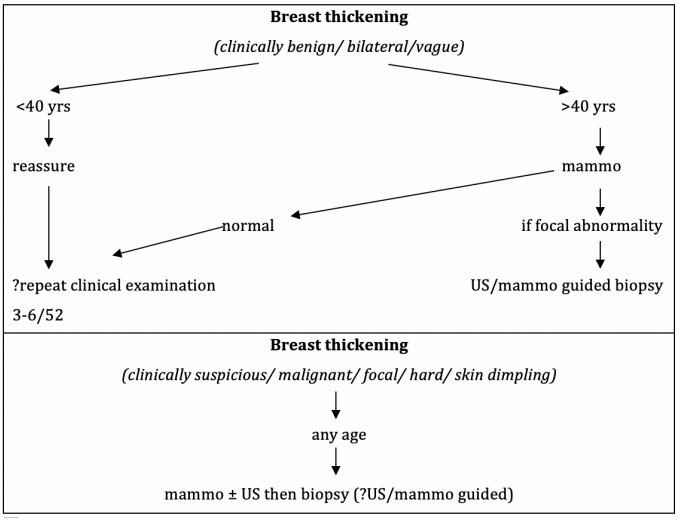
Biopsy results should be reported as follows (IACC standards):

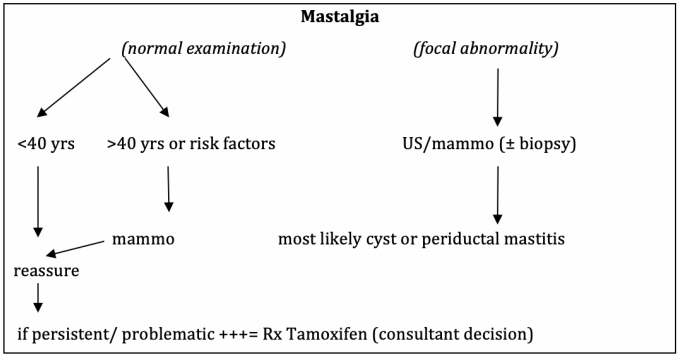
Cytology		Histology	
C1	Insufficient material	B1	Insufficient material
C2	Benign	B2	Benign
C3	Atypical probably benign	B3	Atypical probably benign
C4	Suspicious, probably in situ or invasive carcinoma	B4	Suspicious, probably in situ or invasive carcinoma
C5	malignant	B5	malignant

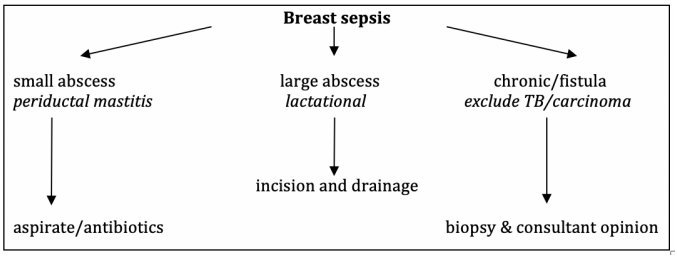
The most definitive test to confirm or exclude cancer is always **HISTOLOGY**- if the lesion has been correctly biopsied (either by core needle or excision biopsy) this gives unequivocal information about the diagnosis; if the patient has a malignancy, it gives the treating team details about histological and genetic profiling subtype, hormone receptors, tumour grade, vascular invasion- all of which help plan treatment. None of these details is reliably obtained from cytology aspiration (or from radiological investigations!!).

Guidelines to Special Investigation









MANAGEMENT OF FIBROADENOMAS

Clinical features of a typical FA

- <3cm
- well defined, smooth
- mobile
- firm
- may be mildly tender or multiple

Management of a *typical* fibroadenoma under 3 cm

Clinical context	Investigations	Management	Follow up if not excised	Indication for surger
< 20 yr old	Nil	Reassure	None	Not recommended
20-25 yr old	Ultrasound	Reassure	None if the US and clinical exam are consistent with FA	Patient request
25 - 30 yr old	Histology + Ultrasound	Offer excision	Annual x 2 yrs	Most patients
> 30 yr old	Histology US +- Mammo	Recommend excision	6 monthly x 2 yrs	All patients

Indications for Surgery in any age group

- Giant fibroadenoma (> 5cm in size)
- Atypical clinical presentation: fixed, irregular, skin changes, lymphadenopathy, rapid growth
- Suspicious biopsy or ultrasound result

GYNECOMASTIA

Gynecomastia is a benign enlargement of the male breast due to proliferation of the glandular component. It is caused by a relative imbalance between oestrogen and androgen levels and can be caused by a wide range of conditions. Gynaecomastia peaks during puberty and in 50 to 80-year-olds. Clinically, gynecomastia is a firm, rubbery, mobile, disc-like mound of tissue arising concentrically from beneath the nipple and areola region. Unilateral and bilateral gynecomastia are both common and benign. ***The overwhelming majority of cases are idiopathic and of no clinical significance***

Organic causes of gynecomastia:

Prescription drugs**:** e.g. Spironolactone, anti-androgens, anabolic steroids, HAART in particular efavirenz, diazepam, tricyclic antidepressants, cimetidine, digoxin, calcium channel blockers

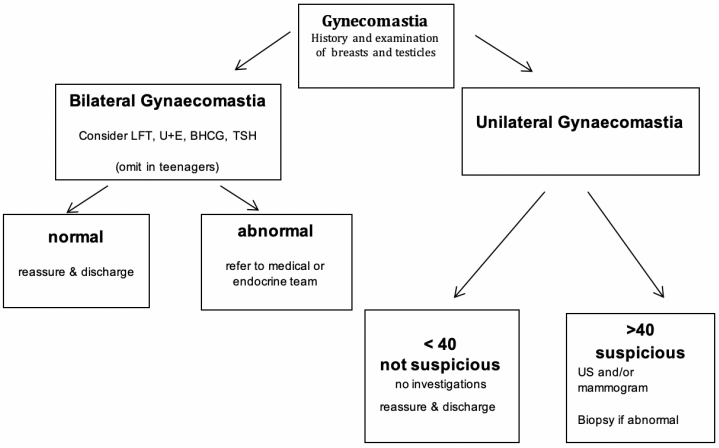
Recreational substances**:** e.g. Alcohol, amphetamines, marijuana, heroin, methadone

Organ dysfunction: liver failure, renal failure, thyrotoxicosis

Endocrinopathy**:** Testicular carcinoma**,** Cushing's syndrome

<u>Causes of unilateral gynecomastia or retroarealar mass:</u>

- All causes of bilateral gynecomastia
- Breast carcinoma
- Benign breast lump



- Gynaecomastia is a common self-limiting condition.
- It is important to exclude cancer but ***do not over investigate***.
- Patients who request surgery for cosmesis may be referred to plastic surgery if symptoms > two years.

DOCTOR, I AM WORRIED I WILL GET BREAST CANCER- I WANT TO BE TESTED!

Take a thorough breast history and examine fully. Any clinical findings need to be investigated contextually.

Formal analysis of risk can be done using online tools- (IBIS Risk Evaluation tool is the one we use at our GSH breast clinic). This will issue a report with the likelihood of cancer within the next 5, 10 years and overall lifetime risk. (http://ibis.ikonopedia.com/ or download file to install on desktop at http://www.ems-trials.org/riskevaluator/)

Most patients grossly over-estimate their risk of developing cancer, and need thoughtful compassionate reassurance.

The following patients should be referred for genetic counselling and testing:

- IBIS lifetime risk estimated >30%
- BRCA mutation risk estimated >10%