

## Long cases in surgery

# Surgery

## Content overview

### The long case

1. General approach to the long case in surgery
  - Presenting your case
  - Preoperative preparation of a patient for surgery
  - Fluid management of a surgical patient
  - Post operative management
2. Long cases
  - **Neck lump**  
Thyroid
  - **Breast lump**
  - **Abdominal pain**  
Peptic ulcer disease  
Acute and chronic pancreatitis  
Gallstone disease  
Ureteric colic
  - **Abdominal mass**  
Epigastric
  - **Dysphagia**
  - **Dyspeptic symptoms**
  - **PR bleeding**  
Carcinoma of the large bowel
  - **Alteration of bowel habits**
  - **Obstructive jaundice**
  - **Hematuria**
  - **Lower urinary tract symptoms**
  - **Peripheral vascular disease**

# Presenting your case

## History and examination

Always remember that the history and examination of a surgery long case should be targeted. The following objectives should be covered by your history and examination.

- Introduction of the patient
- Introduction of the patient medically – Was the patient well before the current complaint? Does the patient have any other important co morbid diseases that could have a direct impact on the management?
- Obtain a differential diagnosis for the presenting complaint and arrive at the most probable one
- Assess for complications
- Look for the possible aetiology for the suspected condition
- Assess the fitness for surgery
- Assess the social factors such as the impact of the condition on the patient's day to day life, family support and options for rehabilitation of the patient after treatment

## Summary and problem list

This is an important aspect of the case presentation. Sometimes this is all that you may be asked during the presentation component.

## Discussion

The discussion of the case will focus on certain key aspects of the case.

- What is the diagnosis/ differential diagnosis?  
When giving your diagnosis the following aspects should be covered  
Anatomical diagnosis  
Pathological diagnosis  
Complications  
Possible aetiology
- Why do you say so?  
Be careful when answering this question. Think of your differential diagnosis. List the points in the history and examination which support the diagnosis and those points which are against the diagnosis. This will help you to discuss better
- How will you investigate this patient?  
Answer that investigations will be carried out to; confirm the diagnosis, assess for the complications/spread, and to assess the fitness for surgery
- How will you manage this patient?  
Management should be discussed in the following components

Surgical management – Discussion will include preoperative preparation, anesthesia, basic facts on the surgery, post operative management and postoperative complications

Medical management

Discharge plan

Advice and follow up

- The final part of the discussion may consist of some theory questions on the disease, pathology and new advances in the treatment of the condition

# **Preoperative preparation**

## **How would you prepare this patient for surgery?**

- Obtain the informed written consent for the procedure
- Do a preoperative assessment
- Optimize any coexisting diseases for surgery
- Drugs  
Modify any drugs that the patient may already be taking
- Special procedures as preparation (i.e. bowel preparation of colonic surgery)
- Premedication
- Fasting and preoperative fluid balance

## **What should you tell the patient as a house officer regarding the surgery?**

- Explain the procedure and tell the patient why surgery is the best option in his or her case
- Explain what type of anaesthesia would be used
- Explain what to expect after the surgery
- Complications
- Long term outcome of the surgery

## **Comment on your preoperative assessment of this patient**

**At this point discuss the following with the examiner**

### **In the history**

- Any coexisting medical conditions you may have detected in the history
- Any past history of anaesthetic problems
- Drug history

### **Comment on your examination**

- Mainly the general examination
- CVS and RS state

### **Classify the patient according to the ASA criteria**

- This is a classification by the American Society of Anesthesiologists and predicts the operative risk in the patient and the overall mortality
- Try to discuss and classify your patient based on this scale
- The criteria is given below

<b>ASA 1</b>	Normal healthy patient ( without clinically significant co morbidity or significant past/ present medical history)
<b>ASA 2</b>	Mild systemic disease that does not limit activity
<b>ASA 3</b>	Severe systemic disease that limits physical activity
<b>ASA 4</b>	Severe systemic disease that is a constant threat to life
<b>ASA 5</b>	Moribund patient

### What are the investigations you would like to perform in this patient?

The investigations to be performed in this patient is threefold

- Investigations to confirm the diagnosis
- Investigations to assess the severity of the disease
- Investigations to assess the fitness for surgery

The basic investigations during the pre operative assessment should be thought of based on systems and organs. Do not do all investigations in all patients.

- A useful guide to investigations  
Do investigations of the system involved – i.e. LFT, clotting profile – in hepatobiliary surgery  
Investigations as a baseline in major surgery – FBC, RFT  
Investigations related to any comorbidity – DM, HT, IHD

Organ system	Investigations	Comments
<b>Blood</b>	FBC	Is usually done as a baseline in major surgery
	Blood for grouping and cross matching	Very important investigation in major surgery
	FBS	FBS should be done routinely in all patients > 40 admitted for major surgery
<b>Heart</b>	ECG	Routinely done in all males > 40 and all females > 50
	CXR Echocardiogram	In patients coexisting cardiac disease
<b>Lungs</b>	CXR Lung function tests	Active pulmonary disease Smokers
<b>Kidneys</b>	UFR BU, SC, SE	Very important as a baseline in major surgery
<b>Liver</b>	LFT, serum bilirubin, PT/INR	

## How would you optimize the patient for surgery?

This includes the management of any coexisting diseases in preparation for surgery. Remember that there is a long list of such diseases but at the exam the following are important

- DM
- Cardiovascular disease

Medical disorder	Principles of optimization prior to surgery
<b>Diabetes mellitus</b>	<ul style="list-style-type: none"><li>• Put the patient as 1<sup>st</sup> on the OT list</li><li>• Do the relevant investigations Control – FBS Complications – Renal , CVS</li><li>• <b>In well controlled DM</b> Omit the morning dose of oral hypoglycaemics Measure blood glucose</li><li>• <b>In poorly controlled DM</b> Start insulin 48-72 hours prior to surgery (soluble insulin 6U tds as starting dose) Titrate according to blood glucose Do CBS on morning of surgery (should be below 160) Insulin – dextrose infusion given during surgery</li></ul>
<b>Cardiovascular disease</b> <b>IHD</b>	<ul style="list-style-type: none"><li>• <b>Assess patients based on the NYHA classification</b></li><li>• <b>ECG, CXR, echocardiogram</b></li><li>• <b>Do a cardiology referral</b></li><li>• Control symptoms with drugs – make sure the patient takes the drugs on the day of surgery</li><li>• Deal with aspirin</li><li>• Optimize Hb</li><li>• Intensive monitoring during surgery</li></ul>
<b>HT</b>	<ul style="list-style-type: none"><li>• Assess patient for target organ damage</li><li>• Control BP with antihypertensives (&lt;170/100)</li><li>• make sure the patient takes the drugs on the day of surgery</li><li>• Premedication with anxiolytics</li></ul>

## Comment on the drugs the patient is on. Are any modifications necessary?

Drugs which should be continued	Drugs which should be omitted
Antihypertensives	Antiplatelet drugs
All other cardiac drugs	Warfarin
Antiepileptic drugs	Oral hypoglycaemic drugs (metformin should be stopped earlier)
Asthmatic drugs	

Remember the following special points

- The new trend is not to omit aspirin in patients where aspirin has been given for special indications such as prevention of cardiovascular events  
Clopidogrel should be stopped about 14 days prior to surgery
- **Warfarin**  
Warfarin should be stopped 72h prior to the surgery and the patient converted to heparin  
UFH – should be stopped 4-6h prior to the surgery  
LMWH – should be stopped 12 h before surgery

## What are the drugs you would give as premedication to this patient?

- Antiemetics
- PPI
- Anxiolytics
- Agents for bowel preparation
- **Prophylactic antibiotics**  
The following principles apply for the use of prophylactic antibiotics in surgery

### Indications for antibiotic prophylaxis

- Type of surgery is the most important determining factor for the use of antibiotic prophylaxis
- Antibiotic prophylaxis is given for contaminated, clean-contaminated and some clean operations

Clean	Operations in which no inflammation is encountered and the respiratory, alimentary or genitourinary tracts are not entered into. There is no break in aseptic operating theatre technique.
Clean – contaminated	Operations in which the respiratory, alimentary or genitourinary tracts are entered into without significant spillage
Contaminated	Operations where acute



	Inflammation (without pus) is encountered, or where there is visible contamination of the wound. Examples include gross spillage from a hollow viscus during the operation or compound / open injuries operated on within four hours.
<b>Dirty</b>	Operations in the presence of pus, where there is a previously perforated hollow viscus, or compound / open injuries more than four hours old.

- Route of administration is usually intravenous
- Choice of drug varies according the type of surgery – i.e in GI surgery a combination of cefuroxime and metranidazole is used
- The first dose of drugs should be given immediately after induction
- Single dose is usually adequate usually covers about 4 hours

## **Fasting**

- The current protocol recommends fasting with 6h for solids and 2h for liquids

## **What are the other important aspects you would look into prior to surgery?**

- Preparing the theatre list
- Make sure that an ICU bed is available
- Make sure that the site/ side of the operation is marked
- Send the patient to the theater with
  - BHT
  - All x rays, CT scans and investigations
  - Blue chit
  - Antibiotic vials
  - Any other special equipment

# Fluid management in surgery

This is a key aspect in the management of a surgical patient. Fluid management is important at 3 stages of a patient.

These are

- Preoperative
- Intraoperative
- Postoperative

The main principles of fluid management at any of these stages are as follows

**Amount of fluid to be given = Replace existing deficit + obligatory losses (UOP + insensible loss) + ongoing losses (intestinal fluid, blood)**

- Therefore when calculating the amount of fluid the following 3 aspects should be taken into considered
- Existing deficit
- Obligatory losses – maintenance requirement
- Ongoing losses
- Ideally replacement should be done with fluids with the same volume and composition

## Existing deficit

### Calculation of the existing deficit

Degree of dehydration	Symptoms and signs	Percentage of loss
Mild	Thirst	4%
Moderate	Dry mucus membranes, sunken eyes, reduced skin turgor	6%
Severe	Altered sensorium, decreased UOP, impaired vital signs	8%

The formula for calculation is 10ml/%/kg

### Replacement of the existing deficit

Mild and moderate	Severe
<b>Calculate total amount</b> Give ½ in 1 <sup>st</sup> 8 hours Next half in next 16 hours  Half volume as 0.9% saline Other half as 5% dextrose	<b>First replace IV compartment</b> Bolus 20ml/kg – over 30 minutes Can be repeated  Replace the remaining deficit as in mild and moderate dehydration

## Maintenance fluid

### Calculation of maintenance fluid

Calculation of the maintenance fluid is done in 2 ways in the adult

- Maintenance fluid for 24 hours = Previous day's urine output + insensible loss (500ml)
- 1- 1.5 ml/kg/h

Maintenance electrolytes

- Electrolytes are calculated as follows
- Sodium – 2mmol/kg/day
- Potassium – 1 mmol/kg/day

### Replacement of maintenance fluid

- Remember that the administered fluid should cover the above stated fluid and electrolyte requirements
- Example  
60kg patient  
Total maintenance fluid required = 90ml/h = 2160ml  
Electrolytes = 120mmol sodium and 60mmol potassium
- **Type of fluid which should be given**  
0.9% saline 1l gives 154 mmol/l of sodium – completes the daily requirement  
Give rest of the fluid as 5% dextrose  
Add potassium 20mmol into 500ml of 5% dextrose

## Losses

### Calculation of the losses and replacement

There are 3 types of losses that can be considered in surgery

- Blood loss at surgery
- Drains
- Evaporation
- 3<sup>rd</sup> space loss

The following table gives a guide to the calculation and replacement of fluids during surgery

Loss	Calculation	Replacement
<b>Blood loss</b>	Based on the amount of soaked gauze towels, drain and sucker fluid	If <15% can replace with crystalloids at a ratio of 3:1 OR colloids at a ratio of 1:1
	<b>Total blood volume 70ml/kg</b> <b>Express the loss as a percentage of the total blood volume</b>	If >15% colloids should be given <b>Indications for blood transfusion</b> Low Hb Cardiac disease
<b>Drains</b>	Measure	Replace with Hartmann's
<b>Evaporation</b>		
<b>3<sup>rd</sup> space losses</b>	Depends on the surgery	

## Remember

**Amount of fluid to be given = Replace existing deficit + obligatory losses (UOP + insensible loss) + ongoing losses (intestinal fluid, blood)**

# Post operative management

## How would you manage this patient after surgery?

The basic aspects involved in post operative management are as follows

- Post operative monitoring of the patient
- Pain management
- Manage any existing co morbidities – DM, HT, IHD
- Fluid and electrolyte management
- Nutritional management
- Recognition and management of common post operative complications

## Monitoring

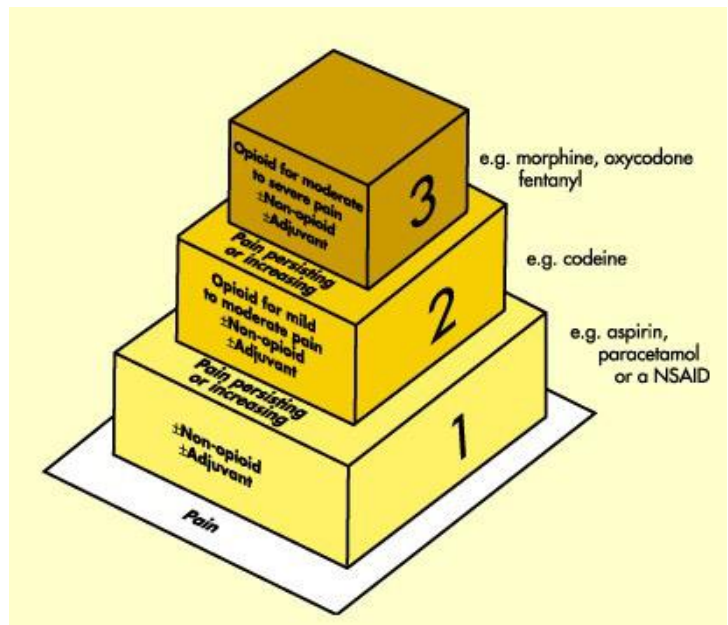
### How would you monitor this patient after surgery?

- The decision of where the patient should be managed post operatively should be made before the surgery
- This could be in an ICU, high dependency unit or the ward
- After the patient enters the ward check the following
  - Patient identification
  - Recovery from anaesthesia
  - Vital parameters
  - Drains and any evidence of active bleeding
- Read the operation notes and follow any special instructions given by the anaesthetist
- Make clear instructions in the BHT for monitoring
  - Start a temperature chart
  - Monitor blood pressure, pulse rate, respiratory rate – use a set guideline
  - Start an input/output chart
  - Monitor the drains and look for active bleeding

## Pain management

### How would you manage post operative pain?

- The basic principles of pain management are as follows
- The analgesics used are classified according to the WHO pain ladder
- Pain relief can be given intra operatively and post operatively



Drug	Routes of administration	Side effects	Contraindications
<b>Opioids</b> Morphine Pethidine	Subcutaneous Intramuscular IV Patient controlled analgesia Spinal/epidural (Remember that pethidine is only given via the IM route)  <b>Morphine 0.1mg/kg 8 hourly</b> <b>Pethidine 1mg/kg IM 8 hourly</b>	Nausea and vomiting Sedation Respiratory depression	Acute respiratory depression Risk of paralytic ileus Raised intracranial pressure and comatose patients
<b>NSAIDS</b> Diclofenac sodium Ibuprofen	Oral administration <b>Diclofenac 1mg/kg (maximum dose 200mg)</b>	Gastric irritation	Peptic ulcer disease Bleeding disorders Renal failure
<b>Local anaesthetics</b> Lignocaine Bupivacaine	Used in epidural analgesia	Arrhythmias, convulsions	

Analgesia is given at various points in surgery

- Intra operatively – Epidural analgesia, infiltration of the wound with local anaesthetics
- Post operatively – Morphine, pethidine, NSAIDs

### Management of existing co morbidities

- Monitor the patient carefully for complications
- Continue the medications that the patient was on

### How would you manage the fluids and electrolytes in this patient?

- See the section on fluid management in surgery

**Amount of fluid to be given = Replace existing deficit + obligatory losses (UOP + insensible loss) + ongoing losses (intestinal fluid, blood)**

## Nutritional management

### When would you start oral feeding in this patient?

- Oral feeding should be started as soon as possible after most procedures

## GI surgery

- Start with low volume feeding from the next day at a rate of 10cc clear fluids per hour. A test feed may be given initially in some patients
- Gradually increase if the patient tolerates the feed
- When the patient passes flatus start giving free fluids
- When bowel opening is established start oral feeds

## Postoperative complications

### What are the post operative complications you would expect in this patient?

When discussing post operative complications remember to answer under the following themes

- Post operative complications that can occur in any surgery
- Post operative complications specific to this surgery

### Post operative complications that can occur in any surgery

- Hemorrhage  
Primary, secondary and reactionary
- Respiratory complications – atelectasis, pneumonia
- Cardiovascular complications – cardiac ischaemia, heart failure, arrhythmias
- Wound complications – hematoma formation, seroma formation, wound infection
- Fever

Day of appearance of fever	Causes
24-48 hours	Metabolic response to trauma Pulmonary atelectasis Pre existing infection Transfusion reaction Drug fever
2-7 days	Chest infection UTI IV line infection Wound infection
5-10 days	Anastomotic leak Wound abscess DVT

- Venous thromboembolism
- Post operative nausea and vomiting

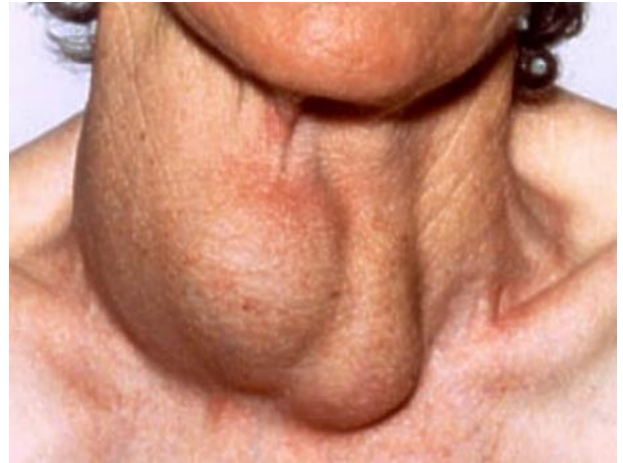
## Thyroid lump

### History

Introduction to the patient

Presenting complaint

- A lump in the anterior aspect of the neck
- Duration
- An important point at this time is confirmation that this neck lump is indeed a thyroid lump. Therefore ask the patient to swallow and make sure that you are dealing with a thyroid lump



History of the presenting complaint

History of the lump

- Describe the history of the lump accurately
- How did the patient notice the lump?
- How has the size of the lump progressed over time? Exclude any recent rapid enlargement
- If the lump has been long standing ask for any alteration of size with pregnancy, lactation
- Symptoms of the lump – especially pain

Look for local effects from the lump

- Ask for difficulty in breathing especially at night and episodes of nocturnal cough which could indicate retrosternal extension

Evidence of malignancy through local and systemic spread

Local

- Recent alteration in the voice (Recurrent laryngeal nerve infiltration)
- Pain in the ear (Vagus nerve infiltration)
- Dyspnoea, cough
- Difficulty in swallowing

Systemic

- Lungs – chronic cough, hemoptysis
- Bone – Bone pain, intractable backache, weakness of the lower limbs, symptoms of hypercalcaemia
- Liver
- Brain – Early morning headache with associated vomiting, adult onset seizures



Establish the thyroid status of the patient with a quick review of the following symptoms

	Hyperthyroidism	Hypothyroidism
<b>General</b>	Hyperactivity, irritability, fatigue insomnia Heat intolerance	Tiredness, apathy, lethargy
<b>GIT</b>	Weight loss despite increased appetite Diarrhoea	Weight gain  Constipation
<b>CVS</b>	Palpitations	Recurrent attacks of angina
<b>Reproductive</b>	Menstrual irregularities	Menorrhagia
<b>Neurological</b>	Tremor Weakness of proximal muscles	

Ask for complications/ previous hospital admissions with emergencies related to hypo or hyperthyroidism

Aetiology

- This part of the history is not very important and may be omitted
- Family history of thyroid disease may be important especially if there is suspicion of familial malignancy
- History of irradiation to the neck

Past medical and surgical history

Drug history

Social history

- Take a detailed social history as in any other case

Examination

Do an examination of the thyroid with the following objectives in mind. For the examination technique refer the section in short cases

- Examination of the thyroid gland itself – This should reveal if you are dealing with a solitary nodule, a diffuse enlargement or a multinodular goiter
- Examination of the surrounding structures – Look for cervical lymphadenopathy, evidence of retrosternal extension, the trachea and carotid pulses
- Examination of the thyroid status

Examine the other systems

## Discussion

There are several cases which could be taken up for discussion

- Solitary nodule of the thyroid and thyroid malignancy
- Management of a multinodular goiter
- Management of Grave's disease

### Solitary nodule of the thyroid

A 30 year old woman presented with a painless lump in the anterior aspect of the neck for 3 months duration. She does not complain of recent change of voice or difficulty in breathing. She does not complain of symptoms which indicate pressure effects. Examination revealed a solitary nodule in the inferior pole of the left lobe of the thyroid. B/L carotid pulses are palpable and the trachea is in the midline. She is clinically euthyroid.

### What is the differential diagnosis of a solitary nodule of the thyroid?

- Prominent nodule in a multinodular goiter
- Cyst
- Thyroid adenoma
- Malignancy of the thyroid gland
- Focal thyroiditis

### What are the investigations you would like to perform in this patient?

- Ultrasound scan of the thyroid gland and surrounding structures in the neck  
This is useful in establishing the morphology of the gland and can also diagnose multinodular goiters which may be missed on examination and also can reliably diagnose thyroid cysts  
Cervical lymphadenopathy can also be picked up. This is useful in the staging of the disease
- The next step is to obtain a tissue diagnosis. This is done by FNAC  
FNAC gives a cytological diagnosis and cannot differentiate between follicular cell adenoma and carcinoma
- The thyroid status should be investigated with thyroid function tests
- Other investigations – isotope scan (not usually performed but may be considered if the TSH is low to demonstrate a hyper functioning or “hot” nodule)

### Management of thyroid malignancy

- The basic principles of management are the same as for any malignancy
- Management of the tumor
- Management of the cervical lymph nodes
- Follow up therapy with adjuvants

## Grave's disease

A 25 year old man presented with weight loss despite a good appetite for 3 months duration. She also admits to be more irritable and nervous throughout this period. She also complains of intermittent palpitations.

On examination she looks anxious, she has lid retraction, lid lag and exophthalmos. Her palms are moist and sweaty with a fine tremor. Her pulse rate is 100/min and is regular in rhythm. Her thyroid gland is diffusely enlarged.



## What is the differential diagnosis of a diffuse enlargement of the thyroid?

- Simple colloid goiter
- Thyroiditis
- Grave's disease

### Most probable diagnosis

- Grave's disease

## What are the investigations you would perform in this patient?

- The most important investigation in this case would be to assess the thyroid status

## How would you manage this patient?

### Initial management in this patient

- The first step would be to start the patient on medical management. This is twofold.
- Beta blockers should be started for relief of symptoms after excluding contraindications for their use.
- Oral propranolol 40mg 8 hourly is an accepted dose
- The patient should also be started on antithyroid drugs such as carbimazole which is the more commonly used drug
- The initial recommended dose of carbimazole is 15-40mg once daily for 4-8 weeks. This is later cut down to a maintenance dose of 5-15mg.
- Therapy is usually continued for 12-18 months
- Other treatment regimens may be also employed such as the block and replace regimen where carbimazole is given with a small dose of levothyroxine. This keeps the TSH within a normal range
- Once treatment has been started the patient should be advised on the following
  - Explain the treatment regimen and the importance of compliance
  - Explain that the size of the thyroid gland may increase and her eye signs may become prominent

Explain that carbimazole is known to cause agranulocytosis and to seek medical attention if she has symptoms and signs of an infection. Especially a sore throat

- **Follow up** in 6-8 weeks with TFT and discontinue propranolol. Switch to the maintenance dose of carbimazole
- **Continuing management**
- Continue with the medical therapy for 12 – 18 months. However there is a risk of relapse after stopping treatment  
The further options are
- **Radioactive iodine therapy**  
This may be used as a first line treatment. Is contraindicated in pregnancy and pregnancy should be avoided 6 months after therapy.  
The patient should stay away from children after therapy as there is a risk of radiation exposure  
Radioactive iodine may make thyroid eye disease worse
- **Surgical management**  
This is usually indicated if medical management has failed and the patient is unsuitable for radioactive iodine therapy  
Subtotal thyroidectomy is the operation of choice

## Multinodular goiter

A 55 year old woman presents with a swelling in the anterior aspect of the neck for 10 years duration. She denies any recent rapid enlargement of the lump or any hoarseness of the voice, dyspnoea or discomfort during swallowing. She also denies any symptoms which indicate pressure effects or symptoms of hypo or hyperthyroidism.

Examination revealed a multinodular goiter with a prominent nodule in the inferior pole of the left lobe with evidence of retrosternal extension, displaced trachea and carotid arteries. She is clinically euthyroid

### Most probable diagnosis

Euthyroid multinodular goiter with a prominent nodule in the inferior pole of the left lobe with evidence of retrosternal extension and with no evidence of malignancy

## What are investigations you would like to perform in this patient?

- Thyroid function tests to assess the thyroid status
- USS may be requested but there is little new information to gain. An assessment of the suspected retrosternal extension may be made

## What are the principles of management?

- The basic steps of management
- Confirm thyroid status
- Manage hyperthyroid state if present
- Look for indications for surgery
  - Cosmetic indications
  - Suspicion of malignancy
  - Evidence of retrosternal extension
  - Significant local pressure effects

## **Thyroidectomy**

This is an extremely important point of discussion in a thyroid case and should be known extensively.

### **How would you prepare a patient for thyroidectomy?**

- Explain the course of management to the patient
- Informed written consent
- Preoperative assessment is as for any surgery
- Preoperative investigations are as for any major surgery but some special investigations are carried out
  - Thyroid function tests
  - X ray neck A-P and lateral (especially in large goiters with pressure effects and evidence of retrosternal extension)
  - Referral to the ENT surgeon for indirect laryngoscopy to assess the state of the vocal cords prior to surgery may be considered
  - Preoperative ionized calcium levels may be done

#### **Ensure euthyroid status**

- If the patient is thyrotoxic he/she should be made euthyroid before surgery. This is achieved by a course of antithyroid drugs +/- Lugol's iodine 10 days prior to the surgery

### **What are the key aspects of the post operative management?**

- QHT
- Monitor PR, RR and BP
- Observe for any difficulty in breathing, stridor
- Monitor drains
- Pain relief
- Antipyretics – Paracetamol 1g tds

- IV fluids – 75cc/h
  - Start oral feeding
  - Monitor for complications
- And manage as necessary

## **What are the complications of thyroidectomy?**

### **Immediate**

- Primary hemorrhage
- Damage to surrounding structures – recurrent laryngeal nerve, external laryngeal nerve, trachea

### **Early**

- Reactionary hemorrhage
- Laryngeal edema
- Thyrotoxic crisis
- Tracheomalacia

### **Intermediate**

- Hypoparathyroidism  
This presents about 36 hours after surgery. The patient presents with circumoral numbness, parasthesia of the fingers and toes  
Chvostek's sign and Trousseau's sign may be demonstrable
- Unilateral recurrent laryngeal nerve palsy  
Presents with hoarseness of the voice
- External laryngeal nerve palsy  
Alters the quality of the voice

### **Late**

- Hypothyroidism
- Recurrent disease

## **Discuss the management of respiratory difficulty following thyroidectomy**

- Examine the patient
- Examine the drain
- Connect to a monitor
- Think of possible causes

The most sinister cause would be laryngeal edema secondary to a hematoma at the site. Look for swelling of the neck.

- If this is suspected remove the skin clips and sutures including those in the deep fascia
- Inform the theater and the seniors

## **How would you follow up this patient?**

### **Follow up**

- Advise the patient on discharge
- Start on thyroxine therapy if indicated
- Levothyroxine 50-100 micrograms once daily in the morning on an empty stomach or at least 30min before breakfast
- Dose may be increased in increments of 25-50 based on the response
- Monitor TSH

# Breast lump

## History

### Introduction

- The age is critical component in the assessment

### Presenting complaint

- A lump in the breast
- Duration

### History of the presenting complaint

### History of the lump

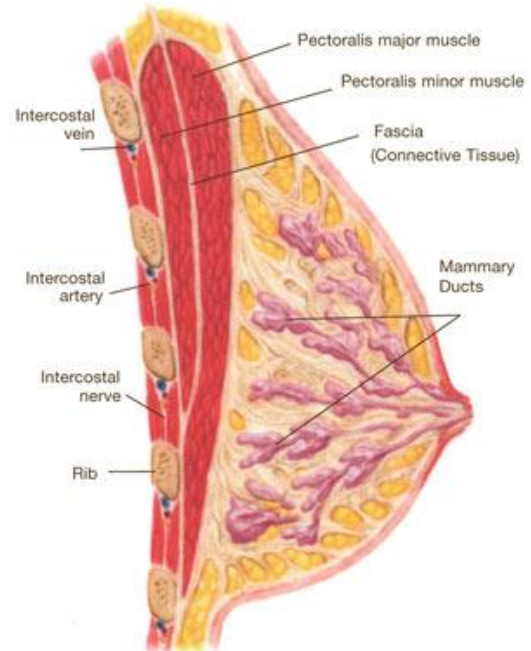
- The first step is to describe the history of the lump accurately. This includes
- How the patient noticed the lump
- Describe the progression of the lump over time. Especially mention any recent rapid enlargement noted by the patient
- Associated symptoms of the lump – pain, alterations in the nipple, discharge from the nipple
- Ask if the patient has noticed any lumps in the other breast

### Exclude some benign breast conditions

- Ask for history of trauma to the breast – Fat necrosis
- Relationship of the size of the lump to the menstrual cycle – Breast cyst
- Contact history or history suggestive of tuberculosis – Tuberculous mastitis

### Establish risk factors for carcinoma of the breast

- Apart from age and gender the following points should be mentioned
- Past history of carcinoma of the breast
- **Reproductive and hormonal risk factors**
  - Age at menarche and menopause
  - Parity – High risk in nulliparous
  - Age at first childbirth – Younger the woman is at her 1<sup>st</sup> childbirth lower the risk
  - Breastfeeding – Is a protective factor
- Exogenous hormones
  - Use of oral contraceptives
  - Post menopausal hormone replacement therapy
- Ask for family history of breast, ovarian, colonic cancer





Ask for any features of local or systemic spread of the disease

- Has the patient noticed any swelling of the arm, lumps at the axilla?
- **Lung** - History of chronic cough, hemoptysis  
**Liver** – Yellowish discoloration of the eyes, right hypochondrial pain, loss of appetite and loss of weight  
**Bone** – Bone pain, intractable backache, features of hypercalcaemia – confusion, constipation, and polyuria  
**Brain** – Early morning headache with associated vomiting, adult onset seizures, weakness of the limbs

Past medical and surgical history

Drug history

Social history

- This is extremely important as if the diagnosis is carcinoma of the breast excellent family support will be required
- Also try to describe the psychological state of the patient

## Examination

**Do a breast examination – See short cases in surgery for the technique**

### Systemic examination

- **General examination** – Pallor, icterus
- **Abdominal examination** – Hepatomegaly, free fluid in the abdomen
- **Respiratory system** – Evidence of pleural effusions
- **Neurological system** – Papilloedema, focal neurological signs

## Discussion

A 50 year old woman presents with a painless lump in the left breast for 3 months duration which has been progressively enlarging over the last month. She has no family history for breast, ovarian or colonic carcinomas. She attained menarche at the age of 12 years and had her first child at the age of 21. She has breast fed all her children. She reached menopause at the age of 48. She is not on HRT. There is no clinical evidence suggestive of distant metastasis.

Examination revealed a 5x4cm lump in the upper outer quadrant of the left breast with ill defined margins, irregular hard surface not attached to the skin or the underlying pectoralis major muscle. There are 2 mobile anterior nodes in the ipsilateral axilla. The opposite breast and the axilla are normal

Example – “Carcinoma of the left breast, T2 N2 M0”

## The reason for the diagnosis

The reasons for stating that the lump is malignant should be based on the history and examination and should be discussed as follows

		Malignant	Benign
<b>History</b>	Age	Usually >35	Young females usually <35
	Presenting symptoms	<b>Can be asymptomatic</b> Palpable lump Skin changes, ulceration, bleeding Nipple changes Enlargement of the breast  <b>Due to loco regional spread</b> Lump in the axilla Swelling of the arm  <b>Due to metastasis</b> Bone, lung, brain	<b>Can be asymptomatic</b> Palpable lump
	Presence of risk factors	+	-
	Features of the lump	<b>Lump</b> Overlying skin changes (peau d' orange), ulceration Irregular margins, irregular surface, usually non tender, firm – hard in consistency, may be attached/ tethered to the skin and/or the deep structures (muscle) <b>Axilla</b> Palpable axillary nodes  <b>Examination evidence of local/ systemic spread</b>	<b>Lump</b> Usually smooth and well demarcated Not attached to the skin/ surrounding structures

## How would you assess a patient with a breast lump?

The assessment of a patient with a breast lump should follow the triple assessment method. This method is used as it gives a diagnosis with 99% accuracy.

### Steps in the triple assessment

- Clinical assessment – History and examination
- Imaging – USS, mammography
- Pathological assessment – FNAC

### Imaging

#### Mammography

- Mammogram is an X-ray of the breast
- 2 views are taken. These are the craniocaudal and mediolateral oblique views. The breast is compressed before taking the images.
- **Features of malignancy**
  - Spiculated soft tissue mass
  - Linear branching micro calcifications
  - Distortion of the soft tissue architecture
- Can detect multifocal lesions in the same breast and lesions in the other breast which may not be apparent clinically

#### Ultrasound scan

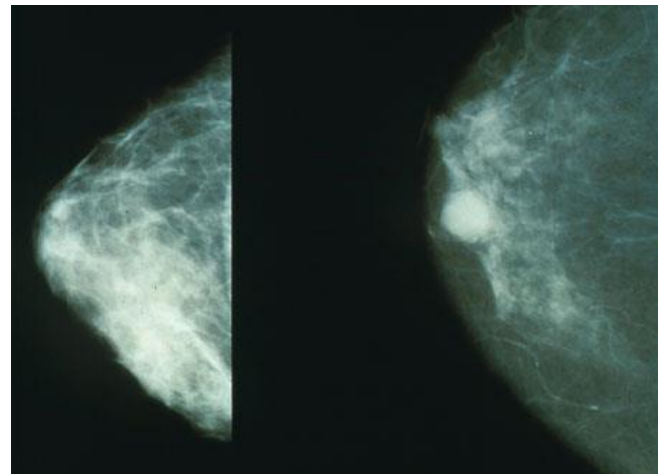
- Is useful in young women who have dense breast tissue in whom mammograms are difficult to interpret.
- Can distinguish solid from cystic lesions

#### Pathological assessment

- FNAC is usually the first line investigation for pathological assessment. It can be done with ultrasound guidance for impalpable lesions
- Core cut biopsy can give a better histological diagnosis- It can distinguish between in situ and invasive malignancies. It is also used for assessment of the receptor status.
- Grading of the disease can also be done with a core biopsy
- Core cut biopsy is used where the FNAC is inconclusive
- However this investigation is more invasive than a FNAC

### Outline of the management

Triple assessment  
Staging  
Early and advanced breast carcinoma  
Surgical management  
Chemotherapy  
Neoadjuvant therapy



## How would you stage the disease?

Breast carcinoma is staged according to the TNM classification

T(Tumour)	N(Node)	M(Metastasis)	Stage
<b>To – No tumour</b>	No – No nodal metastasis	Mo – No distant metastasis	Tis
<b>T1 – Tumour &lt;2cm</b>	No – No nodal metastasis		I
<b>T2 – Tumour 2 – 5cm</b>	N1 – Mobile nodes		II
<b>T3 – Tumour &gt;5cm</b>	N2 – Fixed nodes		IIIa
<b>T4 – Any size with extension to the chest wall, skin or both</b>	N3 – Ipsilateral supraclavicular nodes, infraclavicular nodes, internal mammary <b>and</b> axillary nodes		IIIb
		M1 – Demonstrable metastasis	IV

In order to stage the patient the following investigations should be performed

- FBC
- LFT
- CXR
- USS of the abdomen
- Other investigations if the patient is symptomatic
  - CT brain
  - CT abdomen
  - Bone scan

**For the management of the disease this staging system is utilized to classify breast carcinoma into 3 clinical entities**

Early breast carcinoma	Locally advanced breast carcinoma	Metastatic breast carcinoma
<b>Stage I,II and T3No</b>	Stage III	Stage IV
<b>Surgical management</b> Breast conservation therapy Mastectomy	Chemotherapy	Chemotherapy, Neoadjuvant therapy

## What are the principles of management of breast carcinoma?

This includes

- Management of the tumor
- Management of the axilla
- Neoadjuvant therapy (Specific cancer therapy given before surgery)
- Follow up therapy

The following gives an account of the management of breast carcinoma based on the principles of management

- Management of early breast carcinoma
- Management of advanced breast carcinoma

## Management of early breast carcinoma

### Management of the tumor

The mainstay of the management of early breast carcinoma is surgery. The main surgical options are given below. Selection of patients for these procedures should be done with care

- Breast conservation therapy followed by radiotherapy
- **Mastectomy**  
Modified radical mastectomy  
Skin sparing mastectomy and immediate reconstruction

### Breast conservation therapy

- Involves removal of the tumour(with negative surgical margins) followed by radiotherapy
- Contraindications should be excluded

#### **Absolute**

Multifocal disease

Extensive/ diffuse microcalcifications on the mammogram

Breast carcinoma in pregnancy

#### **Relative**

Contraindication to local radiotherapy (previous radiotherapy at this site, previous heart/ lung disease)

Breast size to tumour ratio (breast conservation therapy would not be effective in patients with a large tumour and a small breast)

- In general small tumor (<3cm in diameter) in the periphery of the breast are suitable for breast conservation therapy
- Advantages are that the woman does not lose her breast and there is better cosmetic result
- The main disadvantage is that there is a risk of local recurrence with breast conservation therapy

### **Mastectomy**

- 2 types of mastectomy are used in present surgical practice
- Modified radical mastectomy
- Skin sparing mastectomy with immediate reconstruction

### **Management of the axilla**

- This is usually performed with a level II axillary clearance. This means that axillary nodes below and behind the pectoralis minor are removed
- Sentinel lymph node biopsy

### **Neoadjuvant therapy**

- This is sometimes used to downgrade the tumor before surgery

### **Follow up treatment**

- The use of systemic adjuvant therapy should be considered
- This includes endocrine adjuvant therapy, adjuvant chemotherapy and biologics
- Factors which are taken into account in selection of patients for adjuvant therapies are
  - Tumour size
  - Grade – Based on the Bloom and Richardson criteria
  - Lympho vascular invasion
  - Node status
  - ER/PR status
  - HER2 over expression
  - Other co morbidities
- These details should be extracted using the pathology reports
- Prognosis should also be taken into account. This is quantified based on the Nottingham prognostic index
- **Chemotherapy**
  - Options available are CMF and anthracycline regimens
  - Taxanes

- **Endocrine therapy**

This is used for ER and PR positive disease. It is also used as a follow up therapy to chemotherapy in high grade tumors. Several options are available

**Blocking the binding of estrogens to breast cancer cells**

Tamoxifen

**Decreasing the production of estrogen by the ovaries**

Surgical oophorectomy

Radiation induced ovarian ablation

GnRH analogues

**Blocking production of estrogens outside the ovaries**

Aromatase inhibitors

Used in post menopausal women

- **Biologics** – Trastuzumab is a monoclonal antibody against the HER2 receptor

## **Management of advanced breast carcinoma**

- The treatment of choice is usually systemic therapy with chemotherapy, endocrine therapy and biologics
- Other aspects of management are
  - Pain management
  - Psychological care

## **Discuss the preparation and post operative management of mastectomy**

- Preparation of the patient for mastectomy
- Post op care
  - The principles are as for any surgery. Special aspects which need to be addressed are
    - Pain – Surgery involving the chest wall can be painful. Therefore ensure adequate analgesia
    - Upper limb physiotherapy – Need to be encouraged
- Look for complications
  - As for any surgery
  - Specific to mastectomy**
    - Skin flap necrosis (Around the 3<sup>rd</sup> post op day)
    - Seroma formation
    - Lymphoedema
- **Advice to the patient after mastectomy**
  - Educate on the surgical procedure performed
  - Educate on complications and advise her to come to the ward if any bleeding, fever, discharge, swelling or abnormalities at the surgical site

Advise to continue upper limb physiotherapy  
Proper care of the arm due to axillary clearance  
Advise the patient on self examination of the breast  
Follow up

## Management of benign breast disease

Benign breast lumps

### Fibroadenoma

- Are aberrations of the normal development of breast tissue
- Commoner in adolescence and the early 20's
- Exaggerated response of lobules and stroma of the breast to normal hormonal stimuli
- 85-90% regress spontaneously
- Triple assessment should be performed as for any breast lump
- May be excised based on patient wishes

### Cysts

- Distended involuted lobules
- Higher prevalence in premenopausal women
- Diagnosed ultrasonically
- May be aspirated
- The patient does not require follow up if the aspirate is not blood stained and the lump disappears after aspiration

### Other benign lumps

- Focal nodularity
- Traumatic fat necrosis
- Lipomas
- Hematoma

### Nipple discharge

- Nature of the discharge is important in the diagnosis
- The history should establish whether the discharge is unilateral or bilateral
- Assessment is made clinically and by mammography
- Nipple discharge cytology has been used

Coloured	Bloodstained	Milky
Physiological Duct ectasia	Duct ectasia Intraductal papilloma	Galactorrhoea



	Epithelial hyperplasia Ductal carcinoma	
--	--	--

- Microdohectomy has been used for the managment

# Dysphagia

## History

### Presenting complaint

- Difficulty in swallowing
- The most important aspect is the duration of symptoms. A long history of symptoms would make benign causes more likely and more sinister causes such as carcinoma of the esophagus unlikely

### History of the presenting complaint

- Describe the onset and progression of symptoms over time
- Ask if the dysphagia is for liquids or for solids
- The next step would be to locate the anatomical site of the lesion as oropharyngeal or esophageal
- The following symptoms should be asked

Oropharyngeal	Esophageal
Difficulty in initiating a swallow	No difficulty in initiating swallowing
Food getting stuck immediately after swallowing	Symptoms arise a few seconds after swallowing the bolus of food
Associated nasal regurgitation	
Coughing and choking	
May have history of neurological disease	

- After oropharyngeal causes have been excluded and the anatomy localized to the esophagus the next step in the history is to identify the pathology.
- Esophageal dysphagia can be caused by mechanical obstruction or by disorders of the esophageal motility.
- **Ask for the pattern of dysphagia**  
Progressive – This indicates a benign or malignant stricture or progressive external compression of the esophagus  
Intermittent – This indicates a neuromuscular cause or a peptic stricture
- Next describe whether the dysphagia is  
Solids>liquids, solids=liquids or liquids> solids
- Ask for the following points in the history to identify a specific diagnosis

## Mechanical obstruction

Cause	Important points in the history
Carcinoma of the esophagus	<p>Progressive dysphagia initially for solids and then for liquids</p> <p>Short duration of symptoms (weeks – months)</p> <p>Can have associated regurgitation of undigested food</p> <p>LOW in spite of a good appetite</p> <p>(Remember that LOA and LOW may indicate that the lesion is in the gastroesophageal junction of the cardia of the stomach)</p> <p><b>Ask for features of local spread</b></p> <p>Hematemesis and malaena</p> <p>Hoarseness of voice</p> <p>Interscapular pain</p> <p><b>Ask for features suggestive of distant spread</b></p> <p>Neck lumps</p> <p><b>Liver</b> – Yellowish discoloration of the eyes, Right hypochondrial pain</p> <p><b>Lungs</b> – Persistent dry cough, shortness of breath, coughing up blood</p> <p><b>Brain</b> – Early morning headache, vomiting, adult onset seizures</p> <p><b>Bone</b> – Intractable backache, bone pain</p>
Benign esophageal strictures	<p><b>Peptic</b></p> <p>Intermittent progressive dysphagia, long history of symptoms</p> <p>Ask for preceding dyspeptic symptoms</p> <p><b>Other</b></p> <p>Ask for ingestion of corrosive substances</p> <p>History of exposure to radiation</p>
Esophageal webs and rings	Ask for history of long standing anaemia

## Disorders of motility

Achalasia	Dysphagia for solids and liquids Can have intermittent dysphagia which can later become progressive Loss of weight Regurgitation of undigested food especially at night Ask for episodes of nocturnal cough and aspiration Recurrent chest infections Ask for associated chest pain
Other disorders of motility	<b>CREST</b> syndrome in scleroderma

- After establishing the possible cause for the symptoms in this patient describe the impact they cause on the patient's life.

### Past medical history

- Ask especially about past history of neurological disease as this can cause dysphagia due to bulbar or pseudo bulbar palsy
- Other co morbid diseases should be asked for

### Past surgical history

### Family history

- Ask for family history of malignancy. Rare genetic disorders can be associated with carcinoma of the esophagus (Tylosis A)

### Social history

- Get a good description of the social circumstances and family support of the patient. This is extremely important if malignancy is suspected
- Smoking and alcohol, betel chewing – Risk factors
- Psychological status of the patient

## Examination

### General examination

- Look for pallor

- Icterus
- Cervical lymphadenopathy
- Evidence of nutritional deficiencies
- Hyperkeratosis of the palms and soles

In a case of dysphagia the examination usually does not reveal many details. But examine all systems in detail.

- Abdominal examination  
Look for lumps in the epigastric region

## **Carcinoma of the esophagus**

### **Pathology**

- Carcinoma of the upper 2/3 of the esophagus are usually squamous in origin while carcinoma of the lower 1/3 are usually adenocarcinoma in origin
- Risk factors
  - Age – Usually more than 55
  - Sex – Male sex is a risk factor for squamous cell carcinoma and oesophagogastric junction tumors
  - Smoking and alcohol – Squamous cell carcinoma
  - BMI – Risk factor for adenocarcinoma
  - Diet – low fiber diet. Rich in meat
  - Inheritance – Rare
  - Existing conditions – Barret's esophagus, achalasia of the cardia

### **Discussion**

A 53 year old lady presents with progressive dysphagia for 3 weeks duration. She admits that the dysphagia was initially for solids but later developed into dysphagia for liquids. She has significantly lost weight in spite of a good appetite. She does not complain if a previous history of dyspeptic symptoms. There is also no history of ingestion of corrosive substances. On examination she is emaciated but not pale or icteric with no cervical lymphadenopathy. There are no palpable masses in the abdomen.

### **Probable diagnosis**

Carcinoma of the esophagus

### **Risk factors**

### **Reasons for the diagnosis**

- Age of the patient

- Progressive dysphagia for a short duration
- Dysphagia for solids later developing into dysphagia for solids and liquids
- LOW despite a preserved appetite

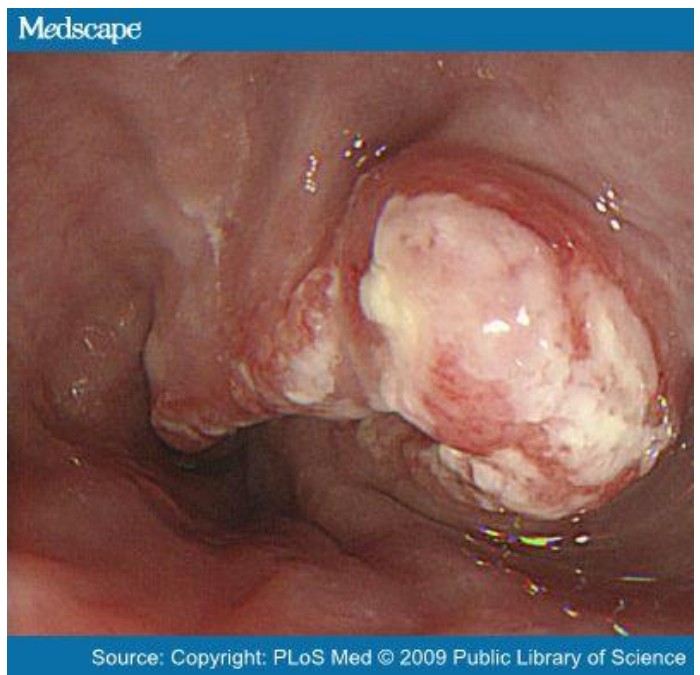
## What are the investigations you would like to perform in this patient?

Investigations should be performed for 3 basic objectives in this patient. These are

- Confirmation of the diagnosis
- Staging/ assessing the severity of the disease
- Assessment of the fitness for surgery

### Confirmation of the diagnosis

- Upper GI endoscopy to visualize the probable lesion and take biopsies from the site
- Informed written consent should be taken prior to the procedure
- Fasting overnight
- Usually carcinoma from the upper 2/3 of the esophagus is usually squamous cell carcinoma while lower 1/3 is usually adenocarcinoma



### Staging

- Local spread and lymph nodal spread may be assessed by endoscopic ultrasound where available
- Contrast CT of the thorax, abdomen and pelvis
- CT thorax gives valuable information on local infiltration and lymph node spread
- Staging laparoscopy is performed in some centers especially in those with suspected gastric involvement
- Other investigations such as bronchoscopy may be required if there is evidence of tracheo-bronchial invasion

### Investigations to assess the fitness for surgery

- Esophageal surgery is associated with a great risk of morbidity and mortality. Therefore thorough investigations should be done
- Blood – FBC to assess the preoperative hemoglobin) , Grouping and cross matching, FBS

- Heart – ECG, echocardiogram
- Lungs – CXR, lung function tests ( This is most important as the surgery may involve a thoracotomy)
- Renal – BU/SE, serum creatinine
- Liver – LFT, serum albumin is also extremely important as it gives a reflection of the nutritional status

## What are the principles of management in this patient?

- Management depends mainly on the stage of the disease and the condition of the patient to undergo major surgery
- Therefore preoperative status and co morbidities of the patient are extremely important
- Curative resection should be attempted in patients without distant metastasis and limited local lymph node spread
- If the tumor is not resectable palliative measures such as ablation of the tumor and stenting can be performed

## How would you prepare this patient for surgery?

- Breaking the bad news to the patient and explaining the future course of management
- Oncology referral for chemotherapy to downstage the tumor prior to surgery
- Optimize the patient for surgery
- Special emphasis should be put on the perioperative nutritional status
- Assess nutritional status
- Enteral nutrition is preferred over parenteral nutrition. Consider use of a feeding jejunostomy if the patient cannot take oral feeds
- Commence preoperative chest physiotherapy
- Arrange for an epidural before surgery
- Arrange for an ICU bed before finalizing the theatre list

## What are the surgical options available for the management?

- The target of surgery is removal of tumor with a clear resection margin ( usually 5-10cm)
- Near total esophagectomy is preferred
- Types of esophagectomy

McKeown	Ivor Lewis	Orringer
Used for lesions above the carina	Used for lesions lower down in the esophagus	Transhiatal
3 stage esophagectomy		Avoids a thoracotomy
Anastomosis in the neck	2 stage	Anastomosis in the neck

Anastomosis performed in the thorax	Blunt dissection of the thoracic part of the esophagus
-------------------------------------	--

## What are the principles of post operative management in this patient?

- Principles as for any major surgery
- ICU management is required
- Observation and monitoring of vital parameters
- Monitor drains including IC tubes, NG
- Analgesics – via epidural catheter
- NBM
- Fluid management – Basic principles
- Pulmonary care – Proper chest physiotherapy
- DVT prophylaxis
- Monitor for complications – Are as for any major surgery but monitor for specific complications.

### **Complications related to the anastomosis**

#### **Respiratory complications**

Damage to the recurrent laryngeal nerve

Tracheo bronchial injury

Pneumonia

Pleural effusion

Chylothorax

- GI care

#### **NBM**

About 2<sup>nd</sup> day commence feeding via the feeding jejunostomy tube

5-7<sup>th</sup> post operative day after intact anastomosis confirmed commence oral feeds

Start with clear fluids and then move on to semi solids and solids

Small volume frequent meals (6 – 8 times per day)

- Confirmation of intact anastomosis by water soluble contrast study
- Advice on discharge and follow up



# Achalasia of the cardia

## Pathology

- Is due to a loss of ganglion cells in Auerbach's plexus
- This causes incomplete or absent relaxation of the lower oesophageal sphincter and absent peristalsis in the body of the esophagus

## Discussion

A 60 year old woman presented with intermittent dysphagia for 1 year duration with symptoms for both solids and liquids. She also admits to have significant nocturnal cough and regurgitation which has worsened over the last few months. She also complains of long standing heartburn. She has a good appetite but has lost about 5kg over the last 6 months.

## Diagnosis

- With this presentation malignancy is extremely unlikely as her symptoms are intermittent and have gone on for 1 year.

## Differential diagnosis

Achalasia of the cardia  
Oesophageal motility disorder  
Benign stricture – peptic  
External compression

## Probable diagnosis

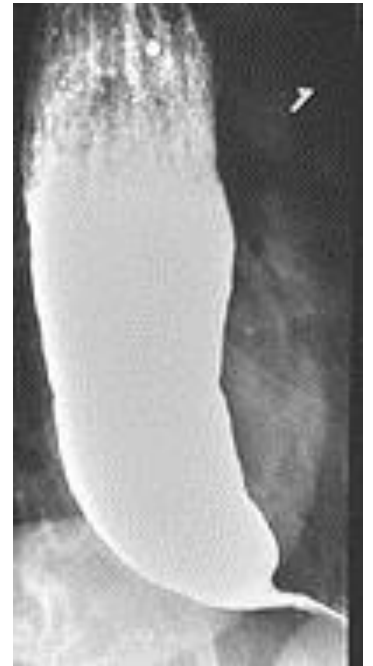
Achalasia of the cardia

## Reasons for the diagnosis

- Long standing symptoms
- Dysphagia for both solids and liquids
- Nocturnal cough and regurgitation is a typical symptom of achalasia as these patients tend to bring up the food matter collected in the oesophagus when they are lying down

## Investigations to be performed in this patient

- On suspicion of achalasia of the cardia, a barium swallow should be arranged for. This would show a dilated esophagus with a "bird's beak" appearance at the lower end



- The confirmatory investigation would be esophageal manometry. This would show elevated lower esophageal sphincter pressure, abnormal relaxation of the lower esophageal sphincter and abnormal peristalsis

**Management options**

- Forceful dilatation of the esophagus
- Heller's cardiomyotomy – Involves cutting the muscle of the lower esophagus and cardia
- Laparoscopic injection of botulinum toxin
- Medical management

## Benign esophageal strictures

This may also be a topic in your discussion. The usual case given is a patient following ingestion of a corrosive substance.

The discussion will usually be based on

- The acute management of a patient with ingestion of a corrosive substance
- Long term complications and follow up of the patient
- Management of the long term complications

Acute management

- Initial assessment and resuscitation  
Airway management is critical in this case as these patients can develop laryngeal edema and airway obstruction. Be ready for intubation or cricothyrotomy
- **AVOID**  
Emesis  
Gastric lavage  
Neutralizing agents  
NG tube suction
- Offer supportive care  
NBM  
IV fluids  
Continuous monitoring – Airway, evidence of perforation, peritonitis and mediastinitis  
Pain relief using opioid analgesics  
Antibiotics – 3<sup>rd</sup> generation cephalosporin  
Intravenous proton pump inhibitors
- Endoscopy by an experienced endoscopist to visualize the extent of injury. The subsequent management is based on the findings at endoscopy
- If injury is severe monitor for perforation over a 1 week period and offer supportive care. In other cases with mild injury initiate oral feeding with liquid diet within 24-48 hours
- Psychiatry referral
- Follow up
- UGI contrast study 4 weeks post ingestion

Remember the following basic facts on caustic ingestion

Alkali	Acid
Causes more esophageal injury	Causes more gastric injury
Causes liquifactive necrosis and deep injury	Causes coagulative necrosis and superficial injury

Long term management

Management of strictures

- Dilation
- Intralesional injection of corticosteroids
- Stenting
- Resection

# Chronic upper abdominal pain and dyspeptic symptoms

## History

### Presenting complaint

- Upper abdominal pain – Define the anatomical site where possible as epigastric, right hypochondrial etc.
- Dyspeptic symptoms are a collection of symptoms. Ask for the other symptoms when the patient has one symptom
- These are
- Epigastric pain/discomfort, abdominal distension, abdominal distension after meals, early satiety, heartburn and acid regurgitation
- State the duration of the symptoms

### History of the presenting complaint

- Describe the onset of pain – 1<sup>st</sup> episode
  - The next step is to describe the pain in detail. This will help to clinch the diagnosis in most cases
  - The episode of pain should be described in chronological order
  - The important points to describe are
  - **Site of the pain**
  - **Onset** – Is the pain of sudden onset or gradual onset? Then describe how the pain progresses with time, how long it takes to reach a peak and the duration of pain at the peak
  - **Character** – Describe the character of pain as colicky or constant. This is extremely important to distinguish early  
**Constant pain** is associated with inflammation and neoplastic infiltration  
**Colicky pain** is associated with obstruction of a muscular tube or by muscular dysfunction. It is gripping and fluctuates in severity at frequent intervals
  - **Radiation** – This may give a clue to the source of the pain and sometimes the extent of the disease
  - **Associated features** – See the table below
  - **Timing** – Describe how long the pain lasts and the pain free interval until the pain recurs
  - **Exacerbating and relieving factors**
  - **Severity** – This may be commented on in several ways. The best ways are to ask the patient to grade the pain and go on to describe how the pain affects their day to day life
- 
- After describing the pain thoroughly describe the progression of pain over time. Especially mention if there is any recent change

- Upper abdominal pain usually arises from the esophagus, stomach, biliary system, liver and pancreas
- The table below gives the important points which should be taken in the history of the common diseases
- Apart from this upper abdominal pain can be caused due to hepatic pathologies, medical problems

Past medical and surgical history

Family history

Social history

## Examination

General examination

Look for

- Pallor- Peptic ulcer disease, carcinoma of the stomach
- Icterus  
May be seen in  
Obstructive jaundice as a complication of gallstone disease, chronic pancreatitis/ carcinoma head of the pancreas  
Rarely locally infiltrating carcinoma of the stomach may present with obstructive jaundice  
Hepatic lesions
- Features of nutrient deficiency – Especially features of iron deficiency anaemia in peptic ulcer disease and carcinoma of the stomach
- Lymphadenopathy – Left supraclavicular lymph node in carcinoma of the stomach

Abdominal examination

- Inspection – Abdomen for surgical scars and dilated veins in the abdomen. Examine the umbilicus for Sister Joseph's nodule in gastric carcinoma
- Palpation  
Look for tenderness  
Murphy's sign  
Examine for epigastric masses – Possibilities are gastric carcinoma, carcinoma head of the pancreas, pancreatic pseudocyst  
Look for hepatomegaly
- Percuss for free fluids
- Look for succussion splash
- Do a digital rectal examination

## Discussion – Carcinoma of the stomach

A 50 year old man presented with loss of appetite and loss of weight for 3 months duration. He also complains of intermittent epigastric pain which is not related to meals, abdominal distension and early satiety for the same duration. He denies any progressive dysphagia, hematemesis and malaena or vomiting.

On examination he is pale but not icteric. There is no left supraclavicular lymphadenopathy. His abdominal examination did not reveal any palpable masses or free fluid

### Most probable diagnosis

Carcinoma of the stomach

### Reasons for the diagnosis

- The age is compatible with a diagnosis of gastric carcinoma
- Epigastric pain which is not related to meals with abdominal distension and early satiety is a typical presentation of gastric carcinoma
- Significant loss of appetite and loss of weight are greatly in favor of the diagnosis

## What are the investigations you would like to perform in this patient?

- The key investigation in this case is an UGI endoscopy. This allows direct visualization of the lesion
- Biopsies can be taken from the site of the lesion
- Follow up with the biopsy report
- Arrange for a ultrasound scan of the abdomen
- Do the basic blood investigations

### Pathology of gastric carcinoma

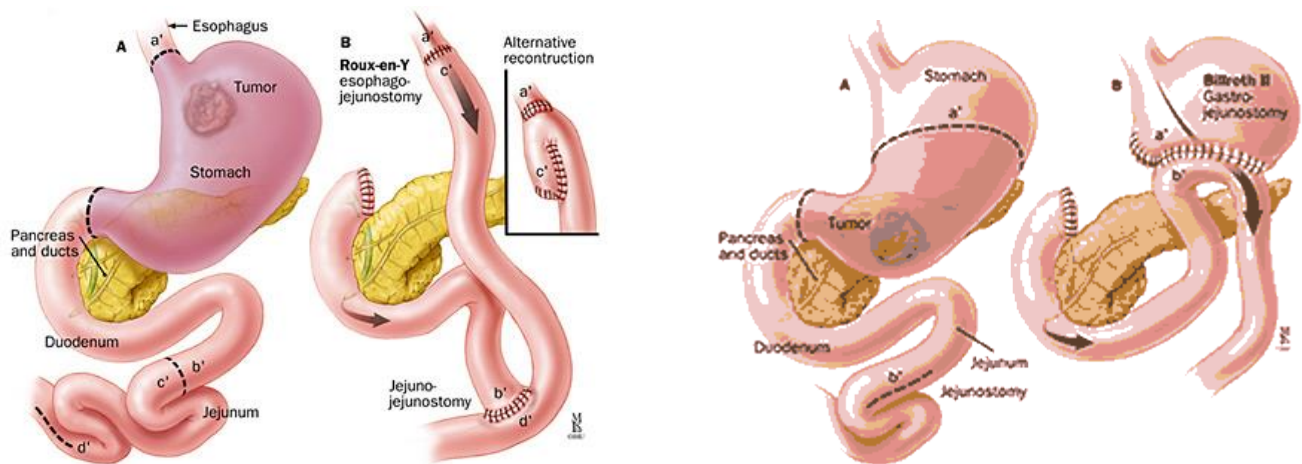
- Are commonly seen in the antropyloric region of the stomach
- Lesions visualized at endoscopy can be exophytic, flat/depressed and excavated
- Rarely the entire wall of the stomach can be diffusely infiltrated by the tumor. This is termed linitis plastica
- Depth of invasion is extremely important in the prognosis
- Gastric carcinoma is an adenocarcinoma
- Microscopically there are 2 types namely intestinal type and diffuse type

### Further investigations

- After confirmation of the diagnosis investigations should be performed for staging
- CT scan of the abdomen
- Endoscopic ultrasonography – Gives an accurate idea of the local spread and local lymph node status

## What are the options for management of carcinoma of the stomach?

- The first step is to decide the operability of the tumor. The tumor is usually termed inoperable when there is extensive local spread, distant metastasis, distant peritoneal spread and extensive nodal disease
- If the lesion is not resectable consider chemoradiotherapy
- Plan the surgical treatment
- **Lesions in the proximal stomach** – Total gastrectomy and lymph node clearance
- **Lesions in the distal stomach** - Distal gastrectomy (Bilroth II gastrectomy or distal gastrectomy with reconstruction with a roux en Y loop



### Preparation of the patient

- Extensive preoperative preparation should be done

## What are the postoperative complications of gastrectomy?

### Early

- As for any surgery
- Dysfunction of the anastomosis
- Leaking from the duodenal stump – Leads to biliary peritonitis

### Late

- Reduced capacity
- Dumping syndrome – Early and late
- Nutritional deficiency – Iron and B12 deficiency

## Pancreatitis



A 30 year old man presented with severe upper abdominal pain of 1 day duration. The pain was of constant nature and radiated through the back. There was also associated vomiting. His past medical history is unremarkable. He is a strong alcoholic but a non smoker. There is no past history of similar symptoms. He denies any episodes of hematemesis or melaena

Examination of the abdomen did not reveal any significant findings apart from tenderness in the epigastric region. Furthermore the patient is hemodynamically stable

### **Differential diagnosis**

- Acute pancreatitis
- Peptic ulcer disease with possible perforation

## **What are the investigations you would like to perform in this patient?**

### **Investigations to confirm the diagnosis**

- Serum amylase – Is elevated above 1000 IU/ml in acute pancreatitis. Other inflammatory lesions near the pancreas (cholecystitis, perforated peptic ulcer) can also cause moderate elevations in the serum amylase

#### **Note**

Serum amylase is not this high in recurrent pancreatitis

Serum amylase is rarely normal in patients with acute pancreatitis. This occurs due to destruction of the gland

- **Imaging**
- **CXR PA (Erect)** – This would show gas under the diaphragm in case of a perforated peptic ulcer
- **XR abdomen (Supine)** – May show ground glass appearance, sentinel bowel loop in acute pancreatitis
- **USS of the abdomen** – To look for evidence of gallstones. The pancreas is poorly visualized in this investigation

### **Investigations to assess the severity of the condition**

- FBC
- RBS
- Blood urea, serum creatinine and serum electrolytes
- Liver function tests

## **How would you manage this patient?**

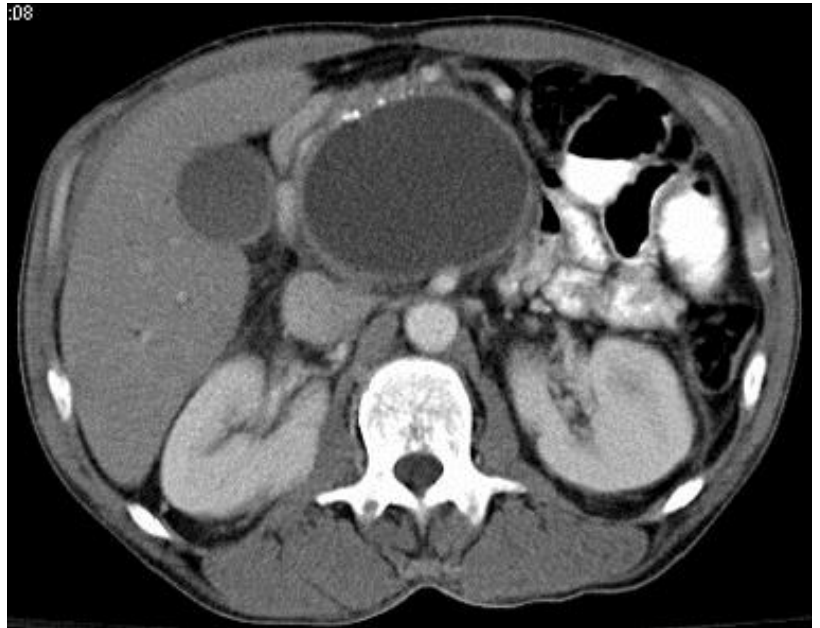
- The initial priorities of management is to classify based on the clinical assessment whether this is a mild or severe attack of pancreatitis
- A severe attack would be based on evidence of systemic involvement, shock and multi organ dysfunction
- This may be done later using accepted scales or scoring systems. These are the Ranson score, Glasgow scale and APACHE II criteria
- These scales are based mainly on investigations and are not commonly used in a Sri Lankan setting

### **Severe attack**

- Resuscitation – Provide oxygen by facemask, obtain IV access and commence IV fluids. Ideal monitoring of fluid therapy should be done by CVP measurement. But use the urine output as a rough guide if this is not available
- Nil by mouth
- Pass a nasogastric tube and aspirate the gastric contents
- Pain relief by opioid analgesics
- IV prophylactic antibiotics may be given (cephalosporin or imipenem) to minimize the risk of pancreatic necrosis getting infected
- Monitor the vital signs and laboratory parameters. ICU care is preferred
- After stabilizing the patient the next step is to try and find a cause for the episode of pancreatitis
- Repeat the biliary ultrasound, do lipid profile and serum calcium levels, contrast CT abdomen may be done
- Note : Causes of acute pancreatitis – Idiopathic, Gallstones, Ethanol, Trauma, Steroids, Mumps, Autoimmune, Snake bite, Hyperlipidaemia/hypercalcaemia, ERCP, Drugs  
Mnemonic I GET SMASHED
- If there is evidence of gallstone pancreatitis ERCP and sphincterotomy should be considered
- Monitor for complications and manage complications
- **Local complications**
  - Pancreatic necrosis and infection**
  - Fluid collections around the pancreas**
    - Acute fluid collection
    - Pseudocyst of the pancreas – Collection of pancreatic enzymes, inflammatory fluid and necrotic debris encapsulated within the lesser sac. Formation requires 4 or more weeks from the attack
    - Pancreatic abscess
  - Pseudoaneurysms** – Of the splenic artery
- **Systemic complications**
  - Multi organ failure
- Follow up the patient

## How would you manage a pancreatic pseudocyst?

- Diagnosis is by a contrast CT scan of the abdomen. This is also useful to look for an associated pseudoaneurysm
- The size of the pseudocyst is important in deciding the management
- **If <6cm in size**  
Can be managed conservatively with observation for up to 6 months if the patient is asymptomatic and there are no atypical findings on the CT
- **If the cyst is larger** consider drainage. This can be done laparoscopically or by an open approach



## Chronic pancreatitis

### Investigations

- **Serum amylase** – Usually not markedly elevated. Can even be within the normal range
- **X Ray abdomen** – May show pancreatic calcifications
- **CT abdomen** – Will show pancreatic calcifications, pancreatic duct dilation
- **ERCP or MRCP**

### Management

- Is usually conservative
- Advise on alcohol cessation
- Low fat diet but with adequate calories
- Pain relief options in patients with chronic pancreatitis is usually limited but celiac ganglion blockade is an option
- Surgery is considered if there are structural abnormalities



## Gallstones

A 50 year old woman presented with recurrent episodes of upper abdominal pain for 1 month duration. She describes these episodes to be of sudden onset and lasting for about 45 minutes to 1 hour. The pain is severe and is exacerbated after meals. She also gives a history of long standing dyspeptic symptoms. She denies ever having hematemesis or melaena, features of obstructive jaundice or cholangitis

Examination is unremarkable



### **Differential diagnosis**

- Gallstone disease – Biliary colic
- Gastric ulcer
- GORD
- Pancreatitis

### **Investigations to be carried out in this patient**

#### **Investigations to confirm the diagnosis**

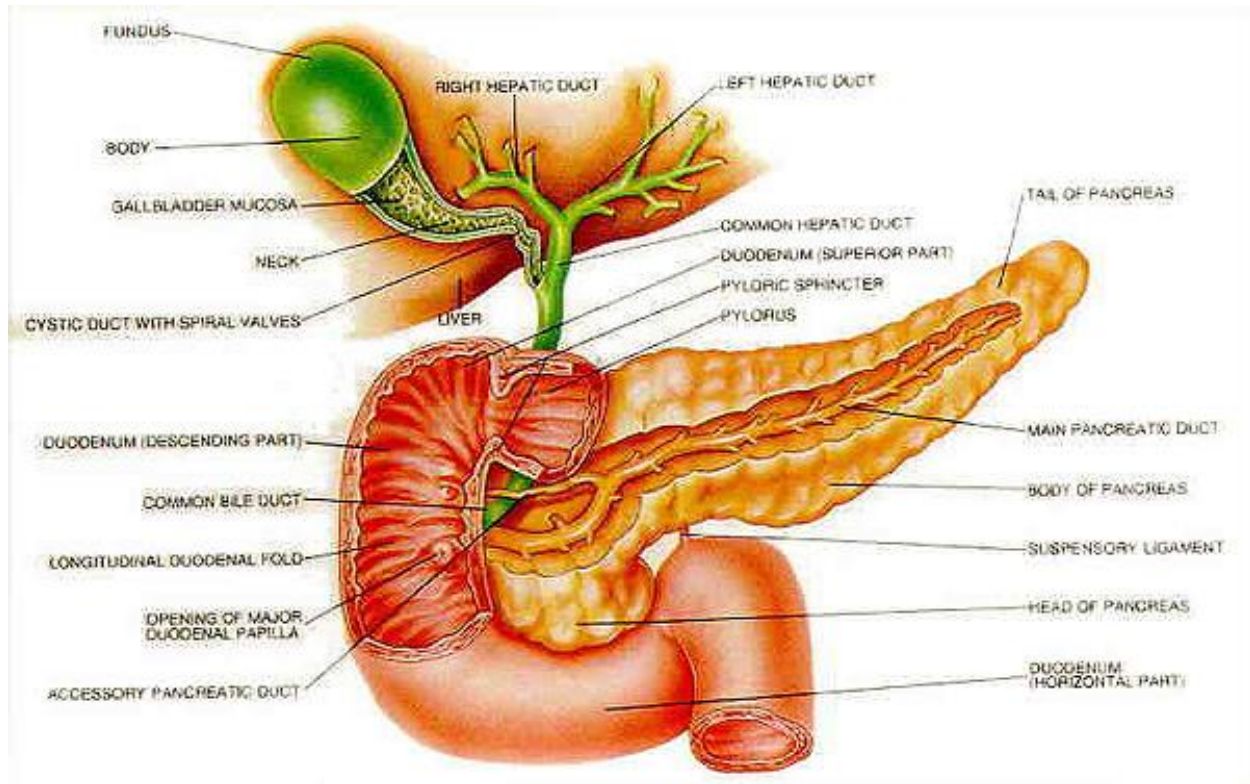
- Ultrasound scan of the abdomen – This investigation will help visualize the biliary system for gallstones
- Upper GI endoscopy – Look for ulcers, suspicious lesions, esophagitis

### **Management options**

- The management of gallstone disease will depend on the various clinical presentations of gallstones

## Obstructive jaundice

### Anatomy of the biliary system



## History

### Introduction

#### Presenting complaint

- Yellowish discoloration of the eyes
- Duration

#### History of the presenting complaint

- Describe the onset and progression of the symptoms over time. A critical point to describe is whether the symptoms have been progressing over time or fluctuating with intermittent symptoms
- Next ask for symptoms which will confirm a cholestatic type of jaundice. These are dark urine, pale stools and associated pruritus
- Then think of a differential diagnosis and ask the relevant questions

Cause	Important points in the history
<b>Carcinoma of the head of the pancreas</b>	Loss of appetite and loss of weight Associated dull epigastric pain radiating to the back which may be worse at night Back pain May have associated alteration in bowel habits with steatorrhoea Recently diagnosed DM (Rare) <b>Ask for features of local spread</b> Gastric outlet obstruction (This is important in another way as gastric carcinoma can also cause obstructive jaundice due to local infiltration) Profuse UGI bleeding (due to vascular invasion)
<b>Periampullary carcinoma</b>	Typically presents with fluctuating jaundice (has been mentioned earlier) and intermittent malaena. (Silver streaked stools)
<b>Chronic pancreatitis</b>	Ask for recurrent episodes of epigastric pain radiating through the back and relieved when the patient is leaning forward Associated nausea and vomiting Alteration of bowel habits (steatorrhoea)
<b>Gallstones</b> <b>Common bile duct</b> <b>Mirizzi's syndrome</b>	Ask for a previous history of dyspeptic symptoms <b>Other presenting symptoms of gallstones</b> History of biliary colic, acute cholecystitis Previous history of similar episodes, episodes suggestive of acute cholangitis, past history suggestive of acute pancreatitis
<b>Bile duct strictures</b>	Ask for past history of hepatobiliary surgery, interventions in the biliary tract
<b>Sclerosing cholangitis</b>	Blood and mucus diarrhea (associated with inflammatory bowel disease, constitutional symptoms such as fever, chills, night sweats)
<b>Other rare causes</b> <b>Carcinoma of the biliary system</b> <b>Lymphoma with porta hepatis lymph nodes</b> <b>Parasites in the common bile duct</b>	

- Remember that intrahepatic cholestasis can also present in a similar fashion. Ask for drugs and history of viral hepatitis - Sexual promiscuity, history of blood transfusion
- The next step is to ask for complications of obstructive jaundice. These are,  
 History of bleeding- Coagulopathy  
 Decreased urine output, swelling of the body – Hepatorenal syndrome  
 High fever with chills and rigors – Acute cholangitis

Past medical and surgical history

Family history – Of similar symptoms, pancreatic carcinoma

Social history

- Obtain a good account of the family history
- Obtain a good dietary history as high fat diet is implicated in the formation of gallstones and is a risk factor for carcinoma of the pancreas
- Smoking – Carcinoma of the pancreas
- Alcohol – Important as an aetiology for pancreatitis and pancreatic carcinoma

## Examination

- General examination is extremely important. Look for  
Icterus  
Pallor  
Features of chronic liver disease  
Lymphadenopathy – especially for left supraclavicular lymphadenopathy  
Skin – scratch marks
- Abdominal examination  
Do a routine abdominal examination. The most important point is to look for a palpable gall bladder  
Courvoisier's law states that if the patient with obstructive jaundice has a palpable gall bladder the cause for the jaundice is unlikely to be due to gall stones

## Discussion

## Where is the lesion?

- You will be asked to make a reasonable anatomical diagnosis after the history and examination.
- The following can be used as a rough guide

Obstructive jaundice with a palpable GB	Obstructive jaundice with an impalpable GB
<b>Obstruction distal to the entry of the cystic duct</b> <b>Pathology except gall stones</b> (However there may be an exception to Courvoisier's law with 2 stones, one in the CBD and one in the cystic duct leading to a mucocoele)	<b>Obstruction proximal to the entry of the cystic duct</b> <b>Gallstones in the common bile duct</b> <b>Gallbladder may be distended but difficult to palpate</b>

## What are the investigations you would like to perform in this patient?

- The next questions in the diagnosis will be based on the initial investigations in a patient with obstructive jaundice
- These are
- **Total bilirubin with direct fraction** – Total bilirubin will be elevated with increased direct fraction
- **Urinary urobilinogen**
- **Liver function tests** – The typical pattern will be elevation of alkaline phosphatase and GGT out of proportion to the rise in transaminases
- **Imaging studies** – Ultrasound scan of the abdomen is an extremely important investigation in the basic assessment of a patient with obstructive jaundice. Look for the dilation of the intrahepatic and extrahepatic duct system. The diameter of the normal common bile duct is less than 6mm

Dilation of both IH and EH ducts	Only IH duct dilation	No duct dilation
<b>Pancreatic head mass</b> <b>Stone in the common bile duct</b>	<b>Hilar cholangiocarcinoma</b> <b>Gallbladder pathology</b> <b>Mirizzi's syndrome</b> <b>Porta hepatis lymphadenopathy</b>	<b>Medical (Intrahepatic cholestasis)</b>

- Ultrasound can also visualize gallstones and assess for ascites
- **Further imaging if necessary** – CT scan of the abdomen, MRCP to visualize the pancreas as it is poorly seen on ultrasound scan as it is obscured by bowel gas
- The final set of investigations are carried out to investigate for the complications of obstructive jaundice
- **PT/INR** – To look for coagulopathy
- **Renal function tests** – To look for Hepatorenal syndrome

## Carcinoma of the head of the pancreas



A 60 year old man presented with progressive painless jaundice for 2 months duration. He also complains of generalized weakness and loss of appetite. He also admits that his urine has become darker in color and that his stools have become pale. He has also developed generalized pruritus. He is a heavy smoker and an alcoholic

Examination revealed deep icterus, there is no cervical lymphadenopathy especially Virchow's node. Abdominal examination is significant for a hepatomegaly which is 3cm from the costal margin in the mid clavicular line. There is also a tensely cystic mass palpable on the right hypochondrium which is probably the gallbladder. There is no free fluid in the abdomen

### **Most probable diagnosis**

- Jaundice with pale stools dark urine and pruritus gives the classical history of obstructive jaundice
- Obstructive jaundice with a palpable gallbladder indicates that the lesion is distal to the entry of the cystic duct
- According to Courvoisier's law the pathology is unlikely to be due to gallstones
- With the short history of progressive painless jaundice with prominent systemic symptoms makes carcinoma of the head of the pancreas a likely diagnosis
- Other D/D

**Periampullary carcinoma**

**Cholangiocarcinoma**

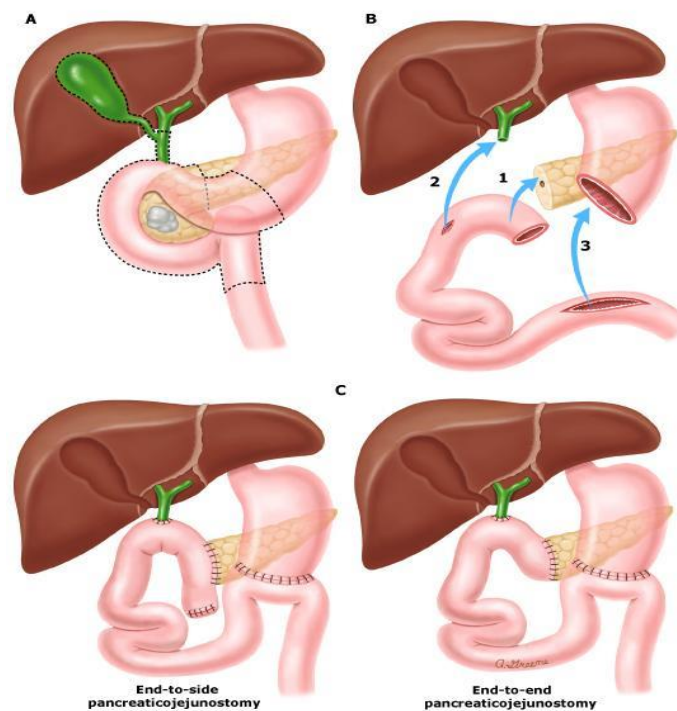
### **What are the Investigations to be carried out in this patient?**

- Investigations should be carried out as initial assessment (see above)
- CT scan of the abdomen to visualize the pancreas and confirm the diagnosis.
- Endoscopy with a side viewing camera may be arranged for to visualize the ampulla to look for a periampullary growth
- ERCP may be considered if the CT fails to show any pancreatic mass lesion. An added advantage is that tissue samples may be collected
- The next step is investigations for staging of the disease and assessing the respectability of the tumor
- There are several criteria which make pancreatic lesions unresectable. These are  
Extrapancreatic involvement, including extensive peripancreatic lymphatic involvement, nodal involvement beyond the peripancreatic tissues, and/or distant metastases.  
Encasement (more than one-half of the vessel circumference) or occlusion of the superior mesenteric vein (SMV) or the SMV-portal vein confluence.  
Direct involvement of the superior mesenteric artery (SMA), inferior vena cava, aorta, or celiac axis
- Tissue diagnosis is usually not required in resectable lesions. Can be obtained by EUS guidance in unresectable lesions
- Ca 19-9 is used as a tumor marker

- If the lesion is resectable to an extensive workup of the patient for the fitness for surgery as this is a major procedure

## What are the principles of management?

- Management is based on the assessment of resectability of the lesion. Patients may not be fit for surgery even if the lesion is resectable
- Preoperative biliary stenting may be performed
- Surgical resection is by Whipple's procedure. Here a pancreaticoduodenectomy is performed. See the picture below for further details
- Preoperative preparation should be extensive and special emphasis should be shown towards correction of coagulopathy and optimization of renal function



- If the lesion is unresectable palliative surgery may be carried out. These include the placement of biliary stents, triple bypass
- Use of chemotherapy may also be considered

## **Gallstones causing obstructive jaundice**

A 30 year old lady presents with episodes of gradual onset right hypochondrial pain radiating to the inferior angle of the scapula for 2 days duration. She also admits that the pain is aggravated by meals. She has had a past history of similar symptoms but the pain has never been this severe. She does not complain of fever with chills and rigors

Examination is significant for icterus and tenderness in the right hypochondrium. There are no palpable masses in the abdomen

### **Most probable diagnosis**

- **Gallstones causing obstructive jaundice**

Remember that gallstones can cause obstructive jaundice in two situations. These are common bile duct stones and Mirizzi's syndrome. The latter implies a stone impacted in the cystic duct which causes compression of the common hepatic duct due to the anatomical proximity

## **What are the investigations to be carried out in this patient?**

- Investigations should be carried out as in any patient with obstructive jaundice

## **How would you manage this patient?**

- ERCP and sphincterotomy is the preferred method with extraction of the stone using a dornia basket
- If this fails endoscopic lithotripsy can be utilized
- A stent should be put in place
- After ERCP a date should be fixed for cholecystectomy
- If these techniques fail the patient should be prepared for open exploration of the CBD with cholecystectomy
- If this is performed a T tube is kept in place. This should be kept in place for 10-15 days the drain monitored. A T tube cholangiogram should be taken before removal to exclude any retained stones

## **How would you prepare this patient for ERCP?**

- Informed written consent
- Fasting overnight
- Correct coagulopathy, hydrate well and administer prophylactic antibiotics

## **What are the complications due to biliary surgery?**

- Retained stone

Several options are available for removal

ERCP

Irrigation of the T tube with the objective of flushing the stone into the duodenum

- Bile duct damage and stricture formation
- Bile leak and biliary peritonitis
- Ascending cholangitis
- Acute pancreatitis
- Special problems due to obstructive jaundice

Coagulopathy

Hepatorenal syndrome

## Per rectal bleeding

### History

#### Presenting complaint

- Bleeding per rectum
- Duration

#### History of the presenting complaint

- Describe the onset and progression of the bleeding
- Estimate the amount of blood passed
- Describe the pattern of bleeding. This is extremely important in localizing the site of the lesion and making a diagnosis
- This includes
  - Is the patient passing altered blood or fresh blood? – Fresh blood means that the lesion may be lower down, probably from the anal canal
  - Is the blood on the stools, streaked on the stools, mixed with the stool or mixed with mucus?

Establish a differential diagnosis and ask the relevant questions

Condition	Important points in the history
Hemorrhoids	Bleeding after defecation, drops of fresh blood on the stools Spurting of blood may be present Ask if the patient has noticed a lump coming out of the anus Perianal discomfort
Anal fissure	Fresh blood streaked on the stool Ask for associated pain. The pain will be sharp severe pain starting during defecation and lasting for about 1hour afterwards
Carcinoma of the rectum	<b>Bleeding pattern</b> may be similar to that of hemorrhoids with fresh blood after defecation <b>Bowel habits</b> Ask for alteration of bowel habits especially early morning blood and mucus diarrhea, constipation or alternating constipation and diarrhea <b>Tenesmus</b> Means painful straining to defecate without resultant evacuation <b>Sense of incomplete evacuation</b> Ask if the patient tries to evacuate bowel several times a day but does not pass much stool. This is termed <b>spurious diarrhea</b> <b>Ask for features of complications</b>

	<p><b>Intestinal obstruction</b> History of colicky lower abdominal pain, abdominal distension, failure to open bowel or pass flatus and faeculant vomiting</p> <p><b>Local spread of the disease</b> Intractable backache with spread to the sacral plexus LUTS and recurrent UTI Faecaluria and pneumaturia Faecal incontinence (Perforation and features of peritonitis)</p> <p><b>Distant metastasis</b> <b>Liver</b> Loss of appetite and loss of weight, right hypochondrial pain, yellowish discolouration of the eye</p> <p><b>Other sites</b></p>
<b>Carcinoma of the sigmoid colon</b>	Similar to the above but may have altered blood streaked stools or blood mixed with stools
<b>Carcinoma of the descending colon</b>	Usually presents with altered blood mixed with stools Do not have tenesmus or sense of incomplete evacuation
<b>Inflammatory bowel disease</b>	Blood and mucus diarrhea, systemic symptoms such as low grade fever Also ask for extra intestinal manifestations Large joint pain, red eye, cholangitis, skin rashes
<b>Chronic infections causing colitis</b>	Not very common Amoebiasis is an example
<b>Rare causes</b>	Diverticular disease Angiodysplasia of the colon Ischaemic colitis Peptic ulcer disease

Past medical and surgical history

Family history

- Ask for family history of carcinoma of the colon and also other malignancies such as ovarian, uterine and gastric carcinoma
- This may be indicative of familial cancer syndromes
- Family history of malignancy is significant among 1<sup>st</sup> degree relatives

## Social history

- Give a good account the family support for the patient
- Get a detailed dietary history from the patient. A low fiber diet is a recognized risk factor for carcinoma of the large bowel
- Personal hygiene, food hygiene may also be important to note
- Describe the psychological state of the patient

## Examination

### General examination

#### Look for

- Pallor
- Icterus
- Peripheral stigmata of inflammatory bowel disease  
Skin – Erythema nodosum, pyoderma gangrenosum  
Eye – Scleritis, uveitis
- Signs of nutritional deficiencies
- Lymphadenopathy – Left supraclavicular node

### Abdominal examination

#### Look for

- Hepatomegaly
- Palpable masses
- Ascites
- Digital rectal examination – Inspect the anal verge and look for any visible lumps, assess the tone of the anal sphincter, Palpate for any masses and note the distance from the anal verge, try to assess the extent of the mass, feel for the consistency and check the mobility of the rectal mucosa over the mass. On removing the finger look for any contact bleeding

### Examine the other systems

## Carcinoma of the large bowel

A 60 year old man presents with bleeding per rectum for 2 months duration. He passes moderate amounts of altered blood with every bowel motion with the blood being mixed with the stool. He also admits that his bowel habits have changed since his symptoms started and that he passes loose stool with blood and mucus several times a day. He also complains of tenesmus and a sense of incomplete evacuation. He also complains of colicky abdominal pain before the passage of stools. He also has loss of appetite and has lost a considerable amount of weight within the last few months.

On examination he is pale and not icteric. There is no lymphadenopathy. There were no masses felt on examination and there is no free fluid in the abdomen. The digital rectal examination revealed an annular firm to hard mass approximately 5cm from the anal verge. There was contact bleeding.

### Most probable diagnosis

**Carcinoma of the colon probably involving the recto sigmoid junction**

### Relating the anatomy and the pathology to clinical presentation

- Majority are adenocarcinomas
- The morphology of the lesions are directly related to their presentations

Carcinoma of the left right colon	Carcinoma of the left colon
Are usually polypoidal exophytic masses that extend along the walls of the colon	Are usually annular encircling lesions that cause obstruction
The colon is more distensible	The colon is less distensible
Faeces is more liquid in nature	Faeces is more solid in nature
Intestinal obstruction is rare	Present with features of intestinal obstruction

## What are the investigations you would like to perform in this patient?

- The first step is to prepare this patient for a flexible **sigmoidoscopy**. This investigation will allow the lesion to be visualized and biopsies may be taken from the site
- Bowel preparation for flexible sigmoidoscopy includes clear fluids from about 12 hours before the procedure, administration of 20mg oral bisacodyl tablets on the night before and bowel enema before the procedure
- Follow up with the biopsy report

### Further investigations and management

- If the biopsy report comes back as malignant the patient needs to undergo investigations for staging of the disease
- Staging systems in use are the TNM classification and Duke's staging
- Contrast CT of the abdomen, thorax and pelvis may be arranged for to stage the disease
- The patient will require a colonoscopy to investigate the complete length of the colon to look for synchronous lesions or polyps



## Polyps of the colon

- A polyp is a tumorous mass that protrudes into the lumen of the gut
- Polyps can be with a stalk. These are termed **pedunculated polyps**
- Some polyps have broad base without a definable stalk. These are **sessile polyps**
- Pathological classification of polyps

### **Neoplastic**

Adenomas – Further classified as villous, tubular or tubulo villous adenomas

Early carcinoma

Lymphoma

GIST

Carcinoid

### **Hyperplastic polyps**

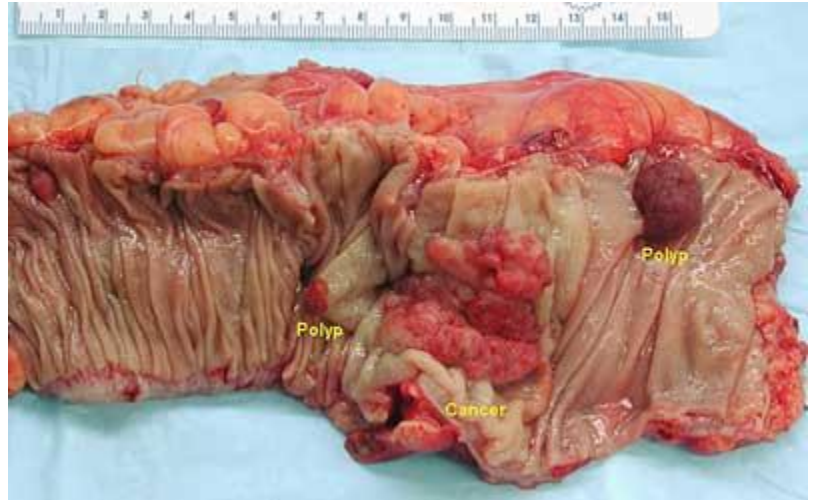
### **Hamartomatous polyps**

Angiomas

Juvenile polyps

Peutz Jeghers polyps

### **Inflammatory polyps**



## How would you prepare this patient for colonoscopy?

Take the informed written consent after explaining the procedures, outcomes and risks

Complete bowel preparation is required

Put the patient on a low fiber diet from about 3 days prior to the procedure

On the day before the procedure prepare the bowel with polyethylene glycol (PEG)

Ask the patient to dissolve one sachet in a liter of water and drink it over a period of 1 hour.

Then wait for 1h and repeat the same

Use about 3 sachets

Only clear fluids allowed after these cycles are completed

## How would you manage this patient?

### Plan the surgical technique

- This is based on the site of the lesion
- The fitness of the patient for surgery – Therefore it is important to investigate the patient thoroughly for other co morbidities
- Some may consider neo adjuvant chemoradiation especially in locally advanced or high grade malignancies to down stage the tumor
- Surgery is planned with the objective of removing the local tumor and its draining loco regional lymph nodes with a good resection margin (Usually about 1-2cm but should be extended if the tumor is poorly differentiated)

### Surgical management of large bowel carcinoma

- If the lesion is resectable the following procedures are usually offered. If the tumor is locally advanced there is a place for neoadjuvant chemoradiation to shrink the tumor
- The resection margins are decided by the distribution of the blood vessels as well as an adequate resection margin

Site of the lesion	Surgical procedure
Carcinoma of the caecum and ascending colon	Right hemicolectomy
Carcinoma of the hepatic flexure	Extended right hemicolectomy
Carcinoma of the transverse colon	Transverse colectomy or extended right hemicolectomy
Carcinoma of the splenic flexure and descending colon	Left hemicolectomy
Carcinoma of the sigmoid colon	Sigmoid colectomy
Carcinoma of the rectum	<p>The management is twofold</p> <p><b>Sphincter saving surgery</b> Tumor should be more 1-2 cm above the anal sphincters. The procedure is known as <b>anterior resection</b></p> <p><b>Sphincter losing surgery</b> <b>Abdomino-perineal resection</b> with a permanent colostomy This is combined with a <b>total mesorectal excision (TME)</b></p>

## How would you prepare this patient for surgery?

- Proper counseling of the patient should take place
- Explain the procedure to the patient including the risks and outcomes and obtain informed written consent
- Counsel on the possible placement of a stoma and educate on stoma care
- Complete the preoperative assessment
- Pre operative preparation is as for any major surgery
- Optimize the patient as this will directly affect healing of the anastomosis
- Prepare the bowel with PEG
- Prophylactic antibiotics – Cefuroxime and metranidazole

## Discuss the principles of post operative management

- This should be as for any major surgery
  - Monitoring – PR, RR, BP
  - Drains
  - Nil by mouth
  - IV fluids – 0.9% saline and 5% dextrose alternatively at 75cc/h (Remember to follow the basic principles of fluid therapy)
  - Analgesics – Through epidural if one sited. If not morphine 0.1mg/kg every 6-8h
  - IV antibiotics – Continue cefuroxime and metranidazole
  - Stoma care
  - Chest physiotherapy
  - DVT prophylaxis
  - Monitor for complications
- These are the same as for any major surgery but there are complications specific to large bowel surgery

### **Early complications**

Damage to local structures – ureter, bladder

Infection at the anastomotic site

Intra abdominal abscesses

Sepsis

Stoma problems – Sloughing, necrosis, retraction

### **Late complications**

Short bowel syndrome

Sexual dysfunction

Small bowel obstruction

- Start oral feeding based on the basic principles

### Follow up

- Advise the patient on the procedure which has been performed
- Follow up with the pathology report
- CEA levels may be used for follow up for recurrences
- (Screening of the family)

## Inflammatory bowel disease

- This is usually not given as a long case but the differences between chron's disease and ulcerative colitis should be known

	Ulcerative colitis	Chron's disease
<b>Pathology</b>	<p>Involves the colon only but may have limited ileal disease</p> <p>Continuous involvement of the affected segment of bowel</p> <p>Affects the mucosa only</p> <p>Causes widespread irregular superficial ulceration with or without pseudo polyps</p> <p>No granuloma formation</p>	<p>Can involve any part of the GIT from mouth to anus</p> <p>Usually forms skip lesions</p> <p>Transmural including the serosa</p> <p>Causes fissured ulceration, cobblestone appearance</p> <p>Granuloma formation is characteristic</p>
<b>Complications</b>	<p>Stricture and fistula formation is rare</p> <p>Anal and perianal disease is rare</p> <p>Toxic megacolon, perforation and hemorrhage may occur</p> <p>Risk of malignant potential high</p> <p>Intestinal obstruction rare</p>	<p>Stricture and fistula formation is common</p> <p>Anal and perianal disease is common</p> <p>Usually does not occur</p> <p>Risk of malignant potential low</p> <p>Intestinal obstruction (incomplete) is common</p>
<b>Management</b>	<b>Medical</b> Nutritional Anti-inflammatory drugs i.e. Aminosalicylates Steroids –Oral, parenteral	<b>Medical</b> This is usually less effective

Immunosuppressive drugs

**Surgical**

In uncontrolled chronic disease  
Evidence of dysplasia or malignancy  
Fulminant colitis

**Surgical management is commonly required**

**Surgical options available**

Subtotal colectomy with ileostomy  
Proctocolectomy with ileostomy  
Restorative proctocolectomy (formation of an ileo-anal pouch)

## Alteration of bowel habits

Note that this is usually not given as an isolated problem

### History

#### Presenting complaint

- Alteration of bowel habits
- State the duration

#### History of the presenting complaint

- The first step is to describe the change in the bowel habit
- Describe the previous bowel habit and compare the present bowel habits

#### Think of a cause

Chronic diarrhoea	Constipation	Erratic bowel habit
Inflammatory bowel disease Chronic infections of the GI tract – Giardiasis Irritable bowel syndrome	Dietary	Irritable bowel syndrome Carcinoma of the large bowel
<b>Malabsorption</b> Pancreatic insufficiency Enteropathy	<b>Bowel obstruction</b> Large bowel carcinoma	
<b>Diseases of the small bowel</b> Villous adenoma VIPoma	<b>Disorders of colonic motility</b> Drugs Neurological disorders	

## Hematuria

Note that the history should cover the following aspects

- Confirmation of hematuria in a patient with red coloured urine
  - Exclude other mimickers of hematuria
    - Dyes
    - Hemoglobinuria
    - Contamination from menstrual blood
- Finding the site of hematuria
  - Glomerular
  - Extra glomerular – renal disease, systemic disease (coagulopathy)  
(In surgery exclusion of glomerular causes is important)
- Finding the cause for hematuria

Presenting complaint

- Age of the patient – extremely important
- Passage of red coloured urine
- State the duration

History of the presenting complaint

### Basic details

- Describe the presenting complaint completely
- Describe the onset and progression of the symptoms over time

### Describe the following basic characteristics of the symptom

- The onset of red coloured urine relative to the urinary stream

	Site of bleeding
<b>Throughout the stream</b>	Upper tract and bladder
<b>Initially only</b>	Urethra
<b>At the terminal stream</b>	Neck of the bladder, prostate

- Describe the colour of the urine
- Remember that bright red colour indicates fresh blood and coca- cola colour indicates altered blood

### Exclude mimickers of hematuria and focus on surgical causes

- Ask for ingestion of red coloured dye containing food stuffs and drugs
- Ask for past history of recurrent attacks of jaundice, symptoms of anaemia with red colored urine to exclude hemoglobinuria
- Describe periodicity and relationship to menstrual cycles and symptoms
- Focus on surgical causes by excluding glomerular bleeding and AGN – ask for associated edema, preceding sore throat or skin sepsis

## Ask questions to find the possible cause

Cause	Important points in the history
<b>Renal</b>	
Trauma to the kidney	Ask for history of trauma
Renal stones and stone disease anywhere in the GUT)	<p>Ask for history of recurrent episodes, associated episodes of abdominal pain (isolated loin pain or loin pain radiating to the groin)</p> <p><b>Complications</b></p> <p><b>UTI</b></p> <p>Associated fever</p> <p>Ask for dysuria, frequency, urgency</p> <p><b>Renal failure</b></p> <p>Decreased urine output, anuria</p> <p><b>Probable aetiology</b></p> <p>Family history of stone disease</p>
Renal cell carcinoma	<p>Ask for associated dull loin pain</p> <p>Ask for symptoms of spread</p> <p><b>Local spread</b></p> <p>Testicular lumps - varicocele</p> <p><b>Distant spread</b></p> <p>Symptoms of respiratory, neurological, bone and liver spread</p> <p><b>Paraneoplastic syndromes</b></p> <p>Pyrexia of unknown origin</p> <p>Hypercalcaemia – confusion and constipation</p> <p>Ask for major risk factors – smoking, exposure to chemicals</p>
Infections of the kidney (Renal TB – rare possibility)	High fever with chills and rigors
<b>Ureters and bladder</b>	
Carcinoma of the bladder	<p>Ask for history of recurrent UTI</p> <p>Symptoms of bladder outlet obstruction</p> <p><b>Risk factors</b></p> <p>Exposure to dyes and chemicals</p>
Bladder stones	
<b>Prostate</b>	Ask for associated LUTS especially features of bladder outlet obstruction
<b>Urethra</b>	
Infection of the lower urinary tract	Ask for fever, dysuria, frequency and urgency

Exclude systemic disorders that can cause a coagulopathy

Family history

Past medical history

Past surgical history

Social history

## Examination

- Remember that most of the clinical assessment of hematuria is done in the history
- The most important point in the examination is to look for an abdominal mass – especially a renal mass in renal cell carcinoma

## Discussion

### What are the investigations you would like to perform in this patient?

- **Start with the initial investigations**
- Urine for microscopy and culture  
This is useful to confirm blood in urine  
Excludes glomerular hematuria – Exclusion of red cell casts, glomerular range hematuria  
Confirms or excludes the presence of a urinary tract infection  
Assess renal function
- Other investigations should be done to visualize the renal tract
- Initial assessment is with plain x ray KUBP and USS of the abdomen

### Imaging investigations of the renal tract in a patient with hematuria

Investigation	Advantages	Disadvantages
Plain x ray KUBP	Is the 1 <sup>st</sup> line investigation for calculus disease of the renal tract May show a calcified renal mass	Can miss radiolucent stones
USS of the abdomen	Is good for visualization of the kidneys Identifies cystic or solid masses in the organs Can show any upper tract dilation Assessment of the bladder Visualizes radiolucent calculi	Does not visualize the ureter properly
IVU	Delineates the outline of the renal tract Visualizes calculi Crude assessment of renal function	Does not visualize renal masses Contrast related problems
CT scan of the abdomen	Visualizes the kidney, renal masses	
CT IVU	<b>Combines the IVU and CT</b>	
Cystoscopy	Direct visualization of the lesion Biopsy can be taken	



**Other special investigations – urine cytology, tumor markers for carcinoma of the bladder**

## **Renal cell carcinoma**

### **What are the principles of management of a patient with a renal cell carcinoma?**

The basic principles of management are as follows

- Stage the disease
- Management is based on the stage of the disease

Stage	Description	Options of management
I	Tumour confined by renal capsule	Radical nephrectomy
II	Tumor extends in to the perinephric fat but confined by Gerota's fascia	Radical nephrectomy
III	Renal vein, IVC, lymphatic involvement	Radical nephrectomy (may not be done if lymphatic spread)
IV	Metastatic spread	Immunotherapy

### **How would you prepare a patient for nephrectomy?**

- See chapter on pre operative preparation
- In this case assessment of the renal function is paramount
  - Assessment of renal function
  - Renal function tests
  - Serum electrolytes
  - Assessment of the functions of the contralateral kidney – this can be done by CT IVU, isotope scanning is also an option

### **What are the complications of nephrectomy?**

- See chapter on post operative management

## Carcinoma of the bladder

### What are the principles of management of carcinoma of the bladder?

- Carcinoma of the bladder is usually of transitional cell origin
- Initial step is to stage the disease. Management depends on the stage

<b>Tumor confined to the mucosa</b>	Transurethral resection
<b>Submucosal invasion</b>	Transurethral resection and intravesical chemo-immunotherapy
<b>Muscle invasive</b>	Total lymphadenectomy and pelvic lymphadenectomy
<b>Regional lymph node invasion</b> <b>Distant metastasis</b>	Systemic chemotherapy

### How would you investigate suspected urinary tract calculi?

The objectives of investigation in patient with suspected urinary tract calculi are as follows

- To confirm the diagnosis
- To define the exact anatomical location of the stone
- Assess complications – effects on the urinary tract and renal function
- Identification of the cause
  - Structural anomalies
  - Metabolic predisposing factors

#### Initial investigations

- **Urine investigations**  
UFR, culture and ABST
- **Blood investigations**  
Renal function tests, serum electrolytes
- **Imaging investigations**  
X ray KUB  
USS of the abdomen  
IVU or CT IVU  
Radionuclide scans
- **Metabolic screening**  
Serum calcium, phosphate, uric acid, 24 hour urinary calcium excretion

## What are the types of urinary tract calculi you know of?

Chemical composition	Features	Aetiology
<b>Calcium oxalate</b>	Radio opaque	Most idiopathic Predisposing factors – stasis, infection, foreign bodies, metabolic disorders - hyperparathyroidism
<b>Magnesium ammonium phosphate</b>	Radio opaque Form large staghorn calculi of the pelvicalyceal system	Chronic infection with urease producing organisms
<b>Uric acid</b>	Radiolucent Yellowish - brown	Hyperuricaemia and gout
<b>Cysteine and xanthine stones</b>	Pure stones radiolucent	Autosomal recessive inherited disorders

## What are the principles of management of urinary tract calculi?

- Conservative
- Stone removal  
Stone removal should be performed if any of the following conditions are met  
Recurrent or persistent symptoms  
Obstructed tract  
Associated infection  
Deterioration of renal function  
Patients with a solitary kidney

Location of the calculus	Options for management
<b>Renal</b>	ESWL (Extracorporeal shockwave lithotripsy)  Effective for most renal calculi except for cysteine stones Not preferred for large stones as the fragments can get obstructed  Percutaneous intervention (Percutaneous nephrolithotomy) Useful for large pelvic stones  Open surgery
<b>Ureteric</b>	Ureteroscopic removal Open surgery
<b>Bladder stones</b>	Litholopaxy

## Lower urinary tract symptoms

### History

#### Presenting complaint

- The patient will present with LUTS. Usually with difficulty in passing urine
- Duration of symptoms

#### History of the presenting complaint

- The first step is to define the symptoms
- There are 2 main categories of LUTS. These are voiding LUTS and storage LUTS

Voiding LUTS	Storage LUTS
Hesitancy Poor stream Intermittent stream Dribbling (including after micturition) Sensation of incomplete emptying Episodes of near retention	Frequency Urgency Urge incontinence Nocturia
<b>Causes</b> <b>Bladder outlet obstruction (BOO)</b>	<b>Causes</b> <b>Infection</b> <b>Overactive bladder (can be secondary to BOO)</b>

- Describe the symptoms the patient has and state any alteration in symptoms over time
- The next step is to find the cause for the symptoms
- The most important presentation in surgery is bladder outlet obstruction with a predominance of voiding LUTS

Cause	Important points in the history
<b>Prostate</b> BPH  Carcinoma of the prostate	Presents with predominant voiding LUTS  <b>Ask about features of local spread</b> Impotence Hematuria  <b>Lymphatic spread</b> Lower limb and genital edema  <b>Metastatic spread</b> LOA and LOW Bone pain Back ache Pathological fractures Lower limb weakness Evidence of spinal cord compression

Bladder neck stenosis	
Urethral strictures	Ask for history of urethral discharge History of urethral instrumentation
Functional obstruction	Exclude the following conditions Spinal cord disease Stroke DM – Autonomic neuropathy Degenerative neurological disease

- **Ask for the complications**  
**Renal failure** – Uremic symptoms
- Next describe the effects the symptoms have on the day to day life and functioning of the patient
- Complete the other components of the history

### Examination

- **General examination**  
Look for stigmata of chronic renal failure
- **Abdominal examination**  
The most important component of the examination is the abdominal examination. Look for the following  
Palpable bladder in patients with chronic retention of urine  
Look for palpable renal masses  
Examine the external urinary meatus to exclude stenosis  
Do a rectal examination and feel the prostate
- **Neurological examination**  
Do a neurological examination to exclude any functional cause for the symptoms  
Neurological deficit in the lower limbs could occur due to bone metastasis and cord compression due to carcinoma of the prostate
- **Examine the back**

## Discussion

### Discuss the initial management of the patient if he presents with acute retention

- The first step is to diagnose acute retention and differentiate from anuria
- The patient with acute retention is in severe abdominal or perineal pain and has a palpable bladder
- Catheterization with the largest catheter available

### How would you investigate this patient?

The following investigations should be carried out in a patient with LUTS

- **Blood investigations**  
FBC - anaemia  
Renal function tests  
Prostate specific antigen
- **Urine investigations**  
UFR and culture to look for features of a urinary tract infection
- **Imaging studies**  
**Ultrasound scan of the abdomen**  
This is used to measure the post void residual urine volume and size of the prostate. The state of the bladder wall and the upper tract can also be assessed
- **Cystourethroscopy**  
Looks for strictures, visualizes the urethra and bladder
- Uroflowmetry and pressure flow urodynamic studies are not routinely performed in Sri Lanka

## Benign prostatic hyperplasia

### What are the principles of management in a patient with BPH?

- The first step is to assess the patient based on the history, examination and investigations. This has been explained above
- The assessment has the following objectives  
Confirm the diagnosis  
Assess the impact on the patient's life  
Looks for complications – renal failure, upper tract changes, urinary tract infection
- Symptom assessment can be done using scoring symptoms such as the IPSS

### Conservative management

#### Drug therapy

The following drugs may be used in the management of BPH

Drug	Mechanism of action	Side effects
<b>Alpha 1 adrenergic antagonists</b> Tamsulosin	Inhibit the contraction of prostatic smooth muscle	Postural hypotension and dizziness
<b>5 alpha reductase inhibitors</b> Finasteride	Decreases the size of the prostate	Sexual dysfunction

### **Surgical management with prostatectomy**

The indications for prostatectomy are as follows. The decision for surgery should be made by a urological surgeon

- Severe symptoms with low flow rates and increased post void residue
- Episodes of acute retention
- Chronic retention and renal impairment
- Complication of BOO – stones, recurrent infection, bladder diverticuli

### **What are the different types of prostatectomy available for patients with BPH**

- TURP – 1<sup>st</sup> line option
- Retropubic
- Transvesical

### **What are the postoperative complications of TURP?**

This is as for any surgical procedure. The specific and important complications are given below

#### **Local**

- Hemorrhage  
This is an important complication following TURP. The most important point of recognition is to check the draining of the bladder after surgery
- Sepsis
- Retrograde ejaculation and impotence
- Incontinence – Extremely rare
- Bladder neck contracture
- Strictures of the urethra

#### **General**

- TURP syndrome  
Absorption of the irrigation fluid causing hyponatremia, hemolysis and cardiac failure. Use of sterile glycine intraoperatively and isotonic saline postoperatively has reduced the incidence

## Carcinoma of the prostate

### What are the principles of management of carcinoma of the prostate?

- The first step is confirmation of the diagnosis. The following investigations are performed
- PSA  
A finding of > 10 nmol/ml is suggestive of cancer
- Transrectal ultrasound scan guided biopsy  
This visualizes the prostate gland and looks for focal lesions. Histological confirmation is done
- Next staging of the disease is performed  
Consider  
CT scan of the abdomen  
Bone scan
- The subsequent management depends on the stage of the disease

Stage	Management options	Notes
<b>Early stage disease – Disease confined to the prostate</b>	Radical prostatectomy	Removal of the prostate down to the distal sphincter with removal of seminal vesicles High incidence of impotence
	Radical radiotherapy	External beam radiotherapy Brachytherapy – radioactive seeds implanted into the prostate
<b>Locally advanced disease</b>	Transurethral resection	Is done in the view of symptom relief
	Neoadjuvant or adjuvant radiotherapy Hormonal therapy	
<b>Metastatic disease</b>	Hormonal therapy	There are 3 management options
		Subcapsular orchidectomy LHRH analogues Anti-androgen drugs



# Peripheral vascular disease

## History

### History of the presenting complaint

The first step is to establish the symptoms the patient has in detail. The presenting symptom is usually intermittent claudication.

When was the patient last well?

Describe the pain in detail. The following questions should be asked

Important points in the history	
<b>Onset and progression</b>	<p>When did the patient 1<sup>st</sup> begin to experience the pain?</p> <p>Describe the onset of the pain</p> <p>Does the pain start with the first step? Establish how far the patient has to walk before he/she experiences the pain. This is the claudication distance.</p>
<b>Site of the pain</b>	<p>This is useful in localizing the anatomical site of the lesion.</p> <p>B/L buttocks and thighs – Aorto-iliac disease (Ask for associated impotence) Thigh and calf – Iliac disease Calf – Femoro-popliteal disease Calf and foot – Distal obstruction</p>
<b>Character of the pain and reproducibility</b>	
<b>Patient's response to pain</b>	<p>Describe what the patient does when he/ she gets the pain.</p> <p>Does the patient rest and for how long? Does the patient have to sit down to relieve the pain?</p> <p>Describe what happens if the patient continues to walk regardless of the pain</p>
<b>Aggravating and relieving factors</b>	
<b>Progression of symptoms over time</b>	

The next step is to ask for complications of the disease

- **Rest pain**

Is described as severe pain lasting for more than 2 weeks in the forefoot which is increased at night and relieved by keeping the leg down. The pain usually does not respond to simple analgesics

- Ask for past history of ulcers, digital necrosis, and amputation
- (Remember that rest pain, necrosis and ulceration indicate critical limb ischaemia)

**The most probable aetiology should be shown. This is usually atherosclerosis**

- Atherosclerosis – Ask for risk factors such as DM, HT, hyperlipidaemia, cigarette smoking, family history
- Buerger's disease- Young male smokers

**Ask for other manifestations of atherosclerosis**

- Cerebrovascular – Past history of stroke, TIA, transient blindness suggestive of amaurosis fugax
- Cardiac – Past history of myocardial infarction, angina, features of heart failure
- Mesenteric – Abdominal pain 30-60 minutes after a meal which lasts for about 2 hours
- Renal – Uncontrolled secondary hypertension
- GUT – Impotence

**Describe any previous surgical procedures/ treatment for these symptoms in the past**

**Describe in detail the effect of the symptoms on the patient's life**

- Day to day activities
- Impact on the person's occupation
- Describe the home environment and the occupational environment and disabilities of the patient
- Psychological state of the patient

## Examination

Examine the peripheral vascular system 1<sup>st</sup> and do a quick examination of the other systems

### Inspection

- Proper exposure from the groin to the toes
- Inspect the feet and toes
  - Colour
  - Trophic changes – loss of skin, hair
  - Gangrene
  - Ulcers

### Palpation

- Palpation – feel the temperature, CRFT
- Examine the pulses – Carotid, radial, brachial, femoral, popliteal and dorsalis pedis pulses
- Offer to measure the ABPI. The proper technique is described below
  - Measure the systolic pressure at the level of the brachial artery in both arms and take the higher value.
  - Apply the cuff a hands breadth above the ankle joint.
  - Locate the posterior tibial and dorsalis pedis using a hand held Doppler device.
  - Start with 1 artery.
  - Inflate the cuff until the Doppler signals are no longer heard. Inflate 20mmHg above this point.
  - Slowly deflate and take the reading of pressure at which the Doppler signals reappear.
  - Repeat with the other artery.
  - Take the higher value.
  - Calculate the ABPI.
- Offer to do the pole test

### Auscultation

- Auscultate for bruits

## Discussion

### What is your diagnosis?

When stating your diagnosis answer based on the following principles

- Peripheral vascular disease
- Anatomical segment involved
- Severity of the condition and any complications associated

### Why do you say so?

- First discuss how you excluded the other causes of claudication based on the history and examination

Differential diagnosis	History	Examination
<b>Intermittent claudication</b>	<ul style="list-style-type: none"><li>• Occurs after walking a distance</li><li>• Reproducible</li><li>• Cramping, aching pain</li><li>• Occurs in muscle groups (buttock, thigh, calf)</li><li>• Is relieved quickly</li><li>• Comes on quickly when walking uphill</li><li>• Other evidence of atherosclerosis</li></ul>	<ul style="list-style-type: none"><li>• Arterial ulcers</li><li>• Gangrene</li><li>• Loss of lower limb arterial pulses</li><li>• Bruits</li></ul>
<b>Neurogenic claudication</b>	<ul style="list-style-type: none"><li>• Sharp pain</li><li>• Is relieved only when the patient sits or bends forward</li><li>• Takes a longer time to be relieved</li><li>• The patient finds it easier when walking uphill</li></ul>	<ul style="list-style-type: none"><li>• Evidence of nerve root compression</li></ul>
<b>Venous claudication</b>	<ul style="list-style-type: none"><li>• Pain is brought on by prolonged periods of standing</li><li>• May be associated with swelling of the lower limbs</li><li>• Is relieved by elevation of the limbs</li><li>• Past history of DVT</li></ul>	<ul style="list-style-type: none"><li>• Varicose veins</li><li>• Venous ulcers</li></ul>
<b>Musculoskeletal pain</b>	<ul style="list-style-type: none"><li>• Pain is present from the first step</li><li>• Associated history of joint pain</li></ul>	

**Determination of the site of the lesion**

Segment involved	History	Examination
<b>Aortoiliac</b>	B/L Claudication in buttocks, thighs and calves Impotence common	B/L Femoral and distal pulses absent Bruit over the aortoiliac region
<b>Iliac</b>	Unilateral claudication of the thigh and calf	Unilateral absence of femoral and distal pulses Bruit over the iliac region
<b>Femoropopliteal</b>	Unilateral claudication of the calf	Femoral pulse palpable with unilateral absence of distal pulses
<b>Distal obstruction</b>	Claudication in the foot	Femoral and popliteal pulses present with absence of unilateral ankle pulses

## How would you clinically classify the severity of the disease?

Peripheral vascular disease should be classified based on the clinical findings according to the Fontaine classification

Stage	Clinical
<b>I</b>	Asymptomatic
<b>IIa</b>	Intermittent claudication with a claudication distance of less than 200m
<b>IIb</b>	Intermittent claudication with a claudication distance of more than 200m
<b>III</b>	Rest pain
<b>IV</b>	Ulceration or gangrene

## What is critical limb ischaemia?

This term is also used when describing the clinical severity of the disease

- Presence of rest pain
- Ankle Doppler pressure of less than 50 mmHg
- Evidence of tissue loss

## What are the investigations you would like to perform in this patient?

- Investigations should be performed to
  - Confirm the diagnosis
  - Assess the severity of the condition
  - Assess the fitness for surgery

## Confirmation of the diagnosis

The following investigations are used in the diagnosis of PVD

- Duplex scanning
- Angiography
  - Digital subtraction angiography
  - CT angiogram
  - MR angiogram

Investigation	Advantages	Disadvantages
<b>Duplex scanning</b>	Is the first line investigation of vascular disease Is non invasive Provides anatomical and functional information	Is operator dependent
<b>Angiography</b>	Is performed in there is an indication for intervention Provides detailed anatomical information	
<b>DSA</b>	The arterial system can be visualized in great detail	Involves the injection of contrast via an arterial puncture  Can have complications <b>Technical</b> Puncture site hematoma A-V fistulas False aneurysms  <b>Contrast related</b> Anaphylaxis
<b>CT angiogram</b>	Avoids an arterial puncture Injection of contrast medium is done in to a vein Anatomical detail seen with reconstructive CT	Large amount of contrast injected Complications due to contrast
<b>MRA</b>	Can visualize the vessels without injection of contrast	Expensive and not freely available

## What the main aspects of preparing a patient for angiography?

- Informed written consent (Follow the basic principles)
- Pre procedural investigations
  - The most important aspect is the renal function
- Preparation
  - Proper hydration of the patient

Administration of N- acetylcysteine in patients with impaired renal function

Administration of steroids in patients with a high risk of developing contrast allergies

## **What are the options for management in this patient?**

- The basic principles of management are as follows
- Conservative treatment
- Interventional treatment
  - Endovascular therapy
  - Surgical management

### **Remember the following basic principles which are taken into consideration when deciding the best mode of management**

- Conservative treatment and life style modifications should be offered to all patients
- The indications for intervention are as follows
  - Severity of the disease and estimated prognosis – Critical limb ischaemia
  - Disabling claudication
  - Inadequate response to conservative management and lifestyle modifications

### **Conservative management**

The conservative management involves the following

- **Risk factor modification**
  - This includes the management of the major risk factors for atherosclerosis and therefore includes,
    - Cessation of smoking
    - Management of hypertension
    - Management of hypercholesterolemia with lipid lowering agents
    - Management of DM
- **Exercise rehabilitation**
  - The patients are advised to walk up to the level of claudication
- **Foot care**
- **Pharmacotherapy**
  - Administration of aspirin
  - Drugs for arterial claudication – Cilostazol, pentoxifylline

### **Interventional management**

There are 2 options for interventional management

- Endovascular – Angioplasty and stenting
  - This is preferred in
  - Short segment stenosis

Single site occlusions

- Open surgery – Bypass procedures

### **How would you prepare this patient for surgery?**

- Proper preoperative assessment is essential in these patients as they commonly have associated cardiovascular co morbidities
- See the section on pre operative preparation

### **What are the complications of arterial surgery?**

#### **Early complications**

- Complications due to generalized atherosclerosis  
Acute myocardial ischaemia  
Stroke  
Renal failure  
Intestinal ischaemia
- Bleeding
- Thrombosis of reconstructed vessels or the graft
- Infection

#### **Late complications**

- Complications due to generalized atherosclerosis  
Acute myocardial ischaemia  
Stroke
- Graft infection
- Graft failure
- False aneurysm formation

### **How would you follow up this patient?**

- Follow up regarding the life style modifications
- Look for features of graft failure



