By the Name of ALLAH the Most Gracious the Most Merciful

The tropical Infection and Infestations L2

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To be read in

Bailey & Love's Short Practice of Surgery 28th Edition. Ch 6

- TUBERCULOSIS
- ROUNDWORM (ASCARI LUMBRICOIDES)
- FILARIASIS.

TUBERCULOSIS

Cervical

Abdominal

TUBERCULOUS CERVICAL LYMPHADENITIS

- This is a common condition at any age.
- Mycobacterium tuberculosis , also known as Koch's bacillus.
- A young person who has recently arrived from an endemic area, presenting with cervical lymphadenopathy, should be diagnosed as having tuberculous lymphadenitis unless otherwise proven.
- With acquired immune deficiency syndrome (AIDS) being globally prevalent, this is not as rare in the West in the indigenous population as it used to be.

Tuberculous Cervical Lymphadenitis

- **General manifestations** : Evening pyrexia, cough (maybe from pulmonary tuberculosis) and malaise; if the sufferer is a child, failure to thrive is a significant finding.
- Any of the cervical group of lymph nodes (jugulodigastric, submandibular, supraclavicular, posterior triangle) can be involved.
- **Locally** : Regional matted lymph nodal mass is the typical clinical feature ; in late stages a **cold abscess** may form – a painless, fluctuant cystic mass which is not warm; significantly there are no signs of inflammation hence it is called a 'cold abscess'. This is a clinical manifestation of underlying caseation.

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IA Submental

IB Submandibular

IIA Upper jugular (anterior)

IIB Upper jugular (posterior)

III Mid jugular

IVA Lower jugular

IVB Medial supraclavicular

VA Upper posterior triangle

VB Lower posterior triangle

VC Lateral supraclavicular

VI Anterior cervical

VIIA Retro-pharyngeal

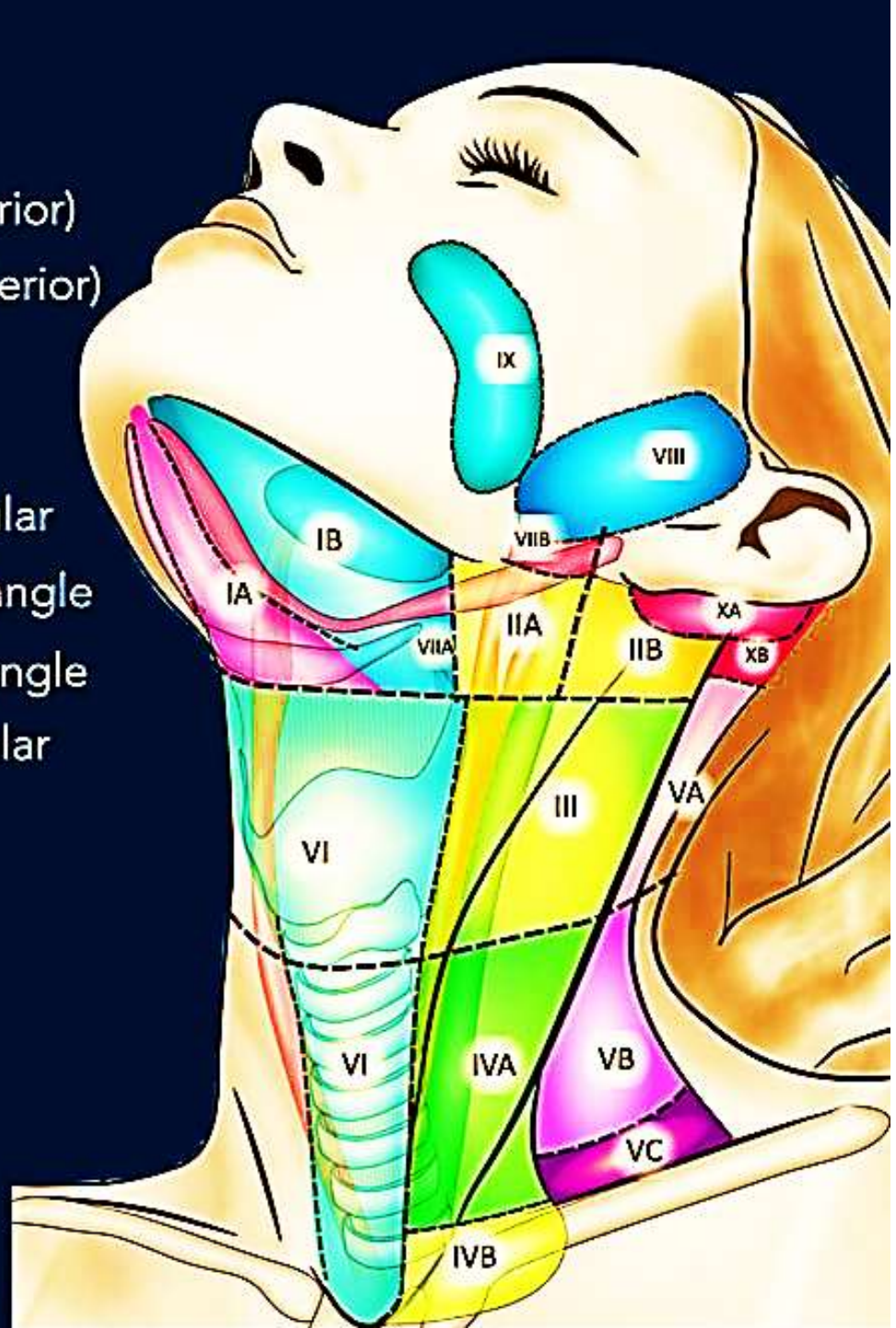
VIIB Retro-styloid

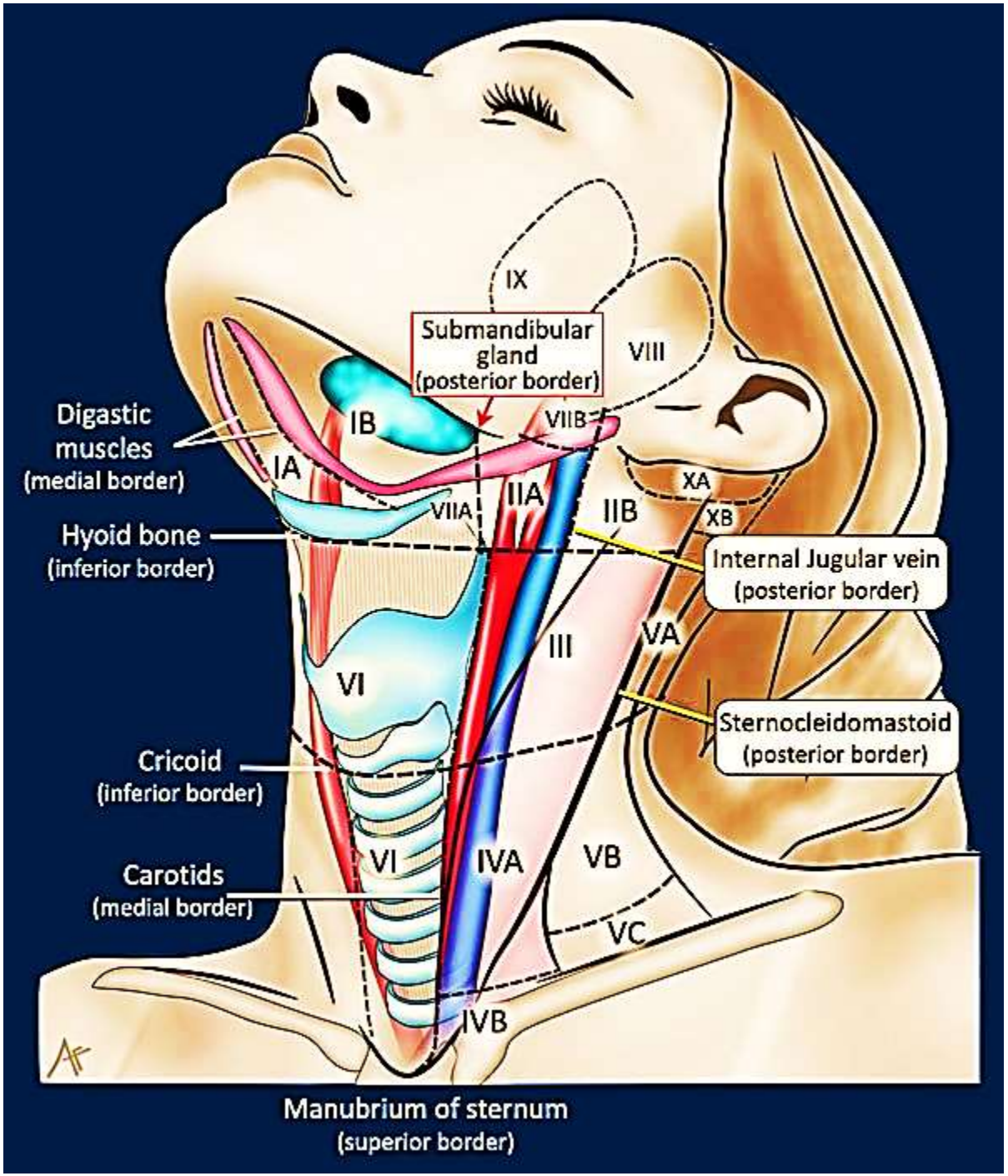
VIII Parotid

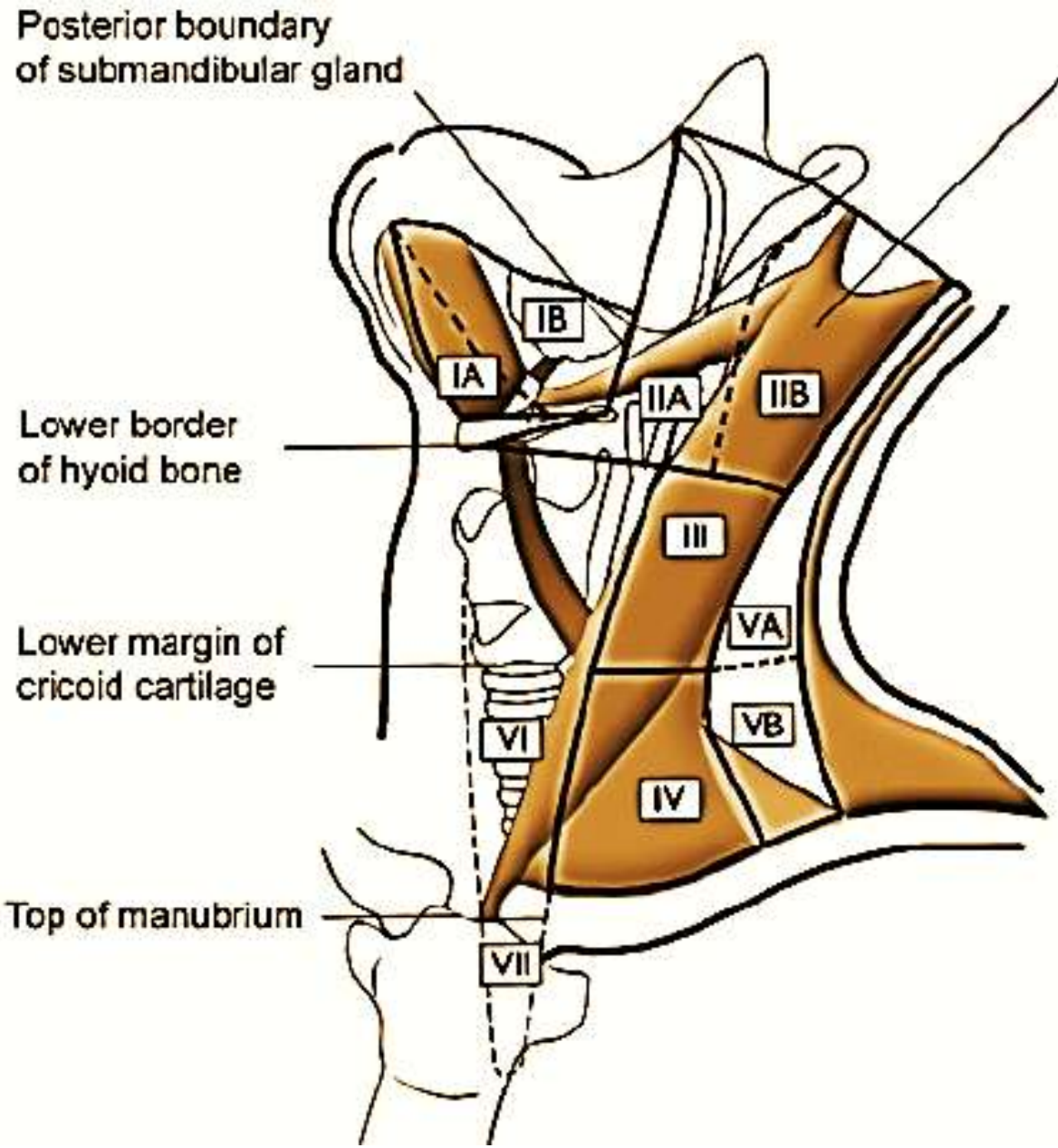
IX Bucco-facial

XA Retro-auricular

XB Occipital




IX
Submandibular gland (posterior border)
VIII
Digastic muscles (medial border)
IB
VIIB
IA
XA
IIA
IIB
VIIA
XB
Hyoid bone (inferior border)
Internal Jugular vein (posterior border)
III
VA
VI
Sternocleidomastoid (posterior border)
Cricoid (inferior border)
VI
IVA
VB
Carotids (medial border)
VC
IVB
Manubrium of sternum (superior border)



I. Level
submental & submandibular

II. Level - upper jugular
(skull base - hyoid)

III. Level - middle jugular
(Hyoid - cricoid)

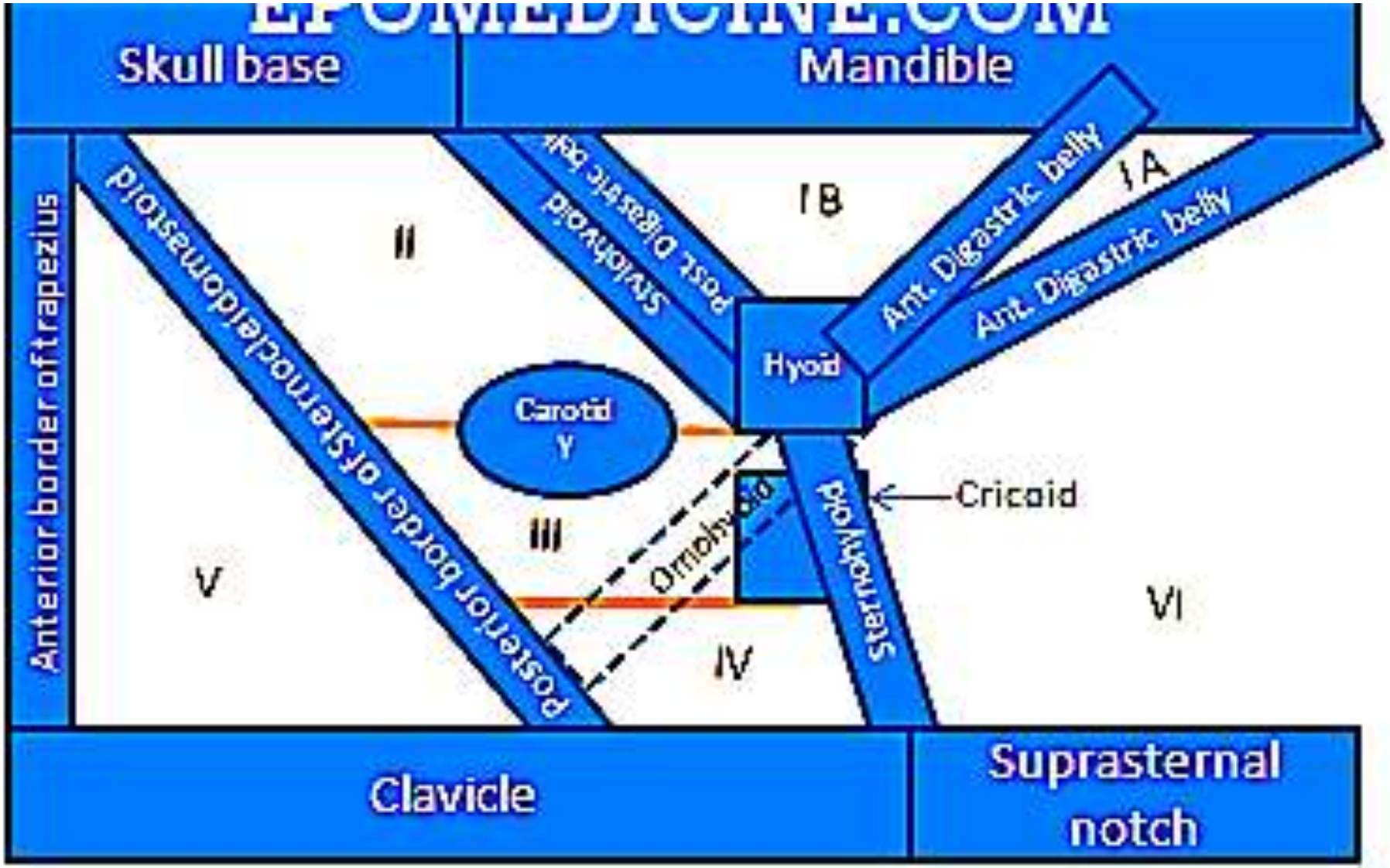
IV. Level - lower jugular
(cricoid - clavicle)

V. Level - posterior triangle
above cricoid
cricoid - clavicle

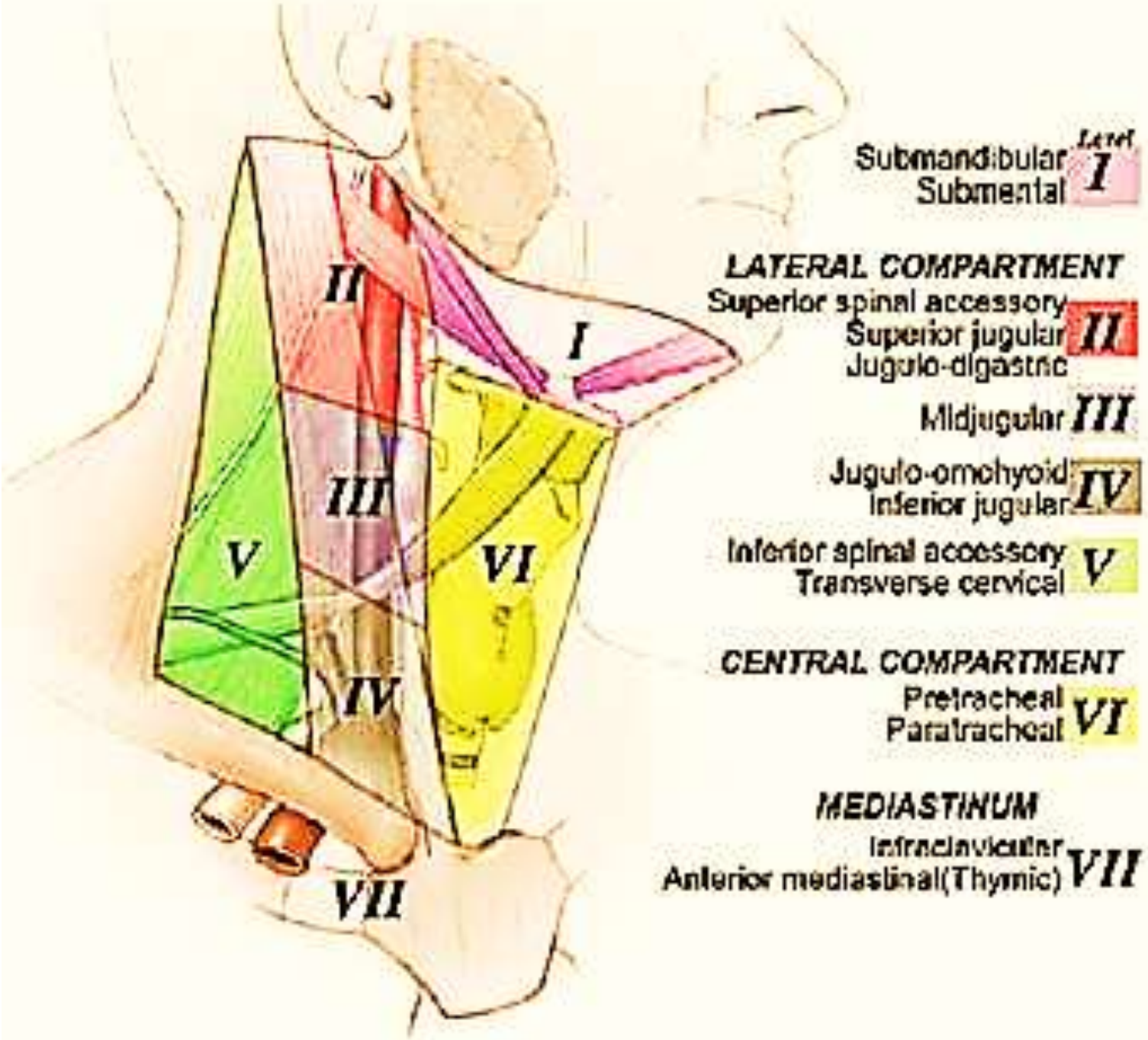
VI. Level - upper visceral
praelaryngeal, prae-, paratracheal

VII. Level - upper mediastinal

Other N groups:
suboccipital, retropharyngeal, parapharyngeal, buccinator, preauricular, peri-, intraparotid



Visual mnemonic or schematic diagram showing boundaries of lymph node levels or zones of neck



Submandibular I
Submental

LATERAL COMPARTMENT

Superior spinal accessory
Superior jugular II
Jugulo-digastric

Midjugular III

Jugulo-omohyoid
Inferior jugular IV

Inferior spinal accessory
Transverse cervical V

CENTRAL COMPARTMENT

Pretracheal
Paratracheal VI

MEDIASTINUM

Infraclavicular
Anterior mediastinal(Thymic) VII

- If the cold abscess is left untreated :

➢ It goes deep to the deep fascia, bursts through into the space just beneath the superficial fascia. This produces a bilocular mass with cross-fluctuation. This is called a '**collar-stud**' abscess.

➢ Eventually this may burst through the skin, discharging pus and forming a **tuberculous sinus** and eventually might. Typically has watery discharge with **undermined edges (DDX)** as the tubercle bacilli destroy the subcutaneous tissue faster than the rest and thrive in the relatively anoxic environment.

- Diagnosis is clinched by culture of pus and biopsy of the lymph node
- Involvement of other systems must be excluded .
- Treatment is mainly medical
- (DDX ????????)

Investigations

- Lymphocytosis, low haemoglobin, Raised ESR and CRP.
- Serology :

  1) Mantoux test (tuberculin skin test) are usual, although the last is not significant in a patient from an endemic area. The Mantoux test although in use for over a hundred years, (has now been superseded by) :

  2) Interferon-gamma (IFN-γ) release assays. This is an in vitro blood test of cellular immune response. Antigens unique to M. tuberculosis are used to stimulate and measure T-cell release of IFN-γ. This helps to earmark patients who have latent or subclinical tuberculosis and thus will benefit from treatment.

  3) PCR (polymerase chain reaction)

- Culture and sensitivity

1) Sputum for culture and sensitivity (the result may take several weeks) and staining by the Ziehl–Neelsen method for acid-fast bacilli (the result is obtained much earlier) should be carried out.

   PCR (polymerase chain reaction)

2) Aspiration of the pus from a cold abscess for culture and sensitivity.

- If the mass is still in the early stages of adenitis, **excisional biopsy** should be done. Here, part of the lymph nodes should be sent fresh and unfixed to the laboratory, which should be warned of the arrival of the specimen so that the tissue can be appropriately processed immediately.

Treatment

- This must be combined management between the physician and the surgeon.
- It must be excluded (DDX)and suitably managed.
- Medical treatment is the mainstay.

TUBERCULOSIS OF SMALL INTESTINE

The infection is transmitted by :

- Swallowing of infected sputum in a patient with pulmonary tuberculosis.
- Drinking infected unpasteurised milk .
- Haematogenous route.

Pathology

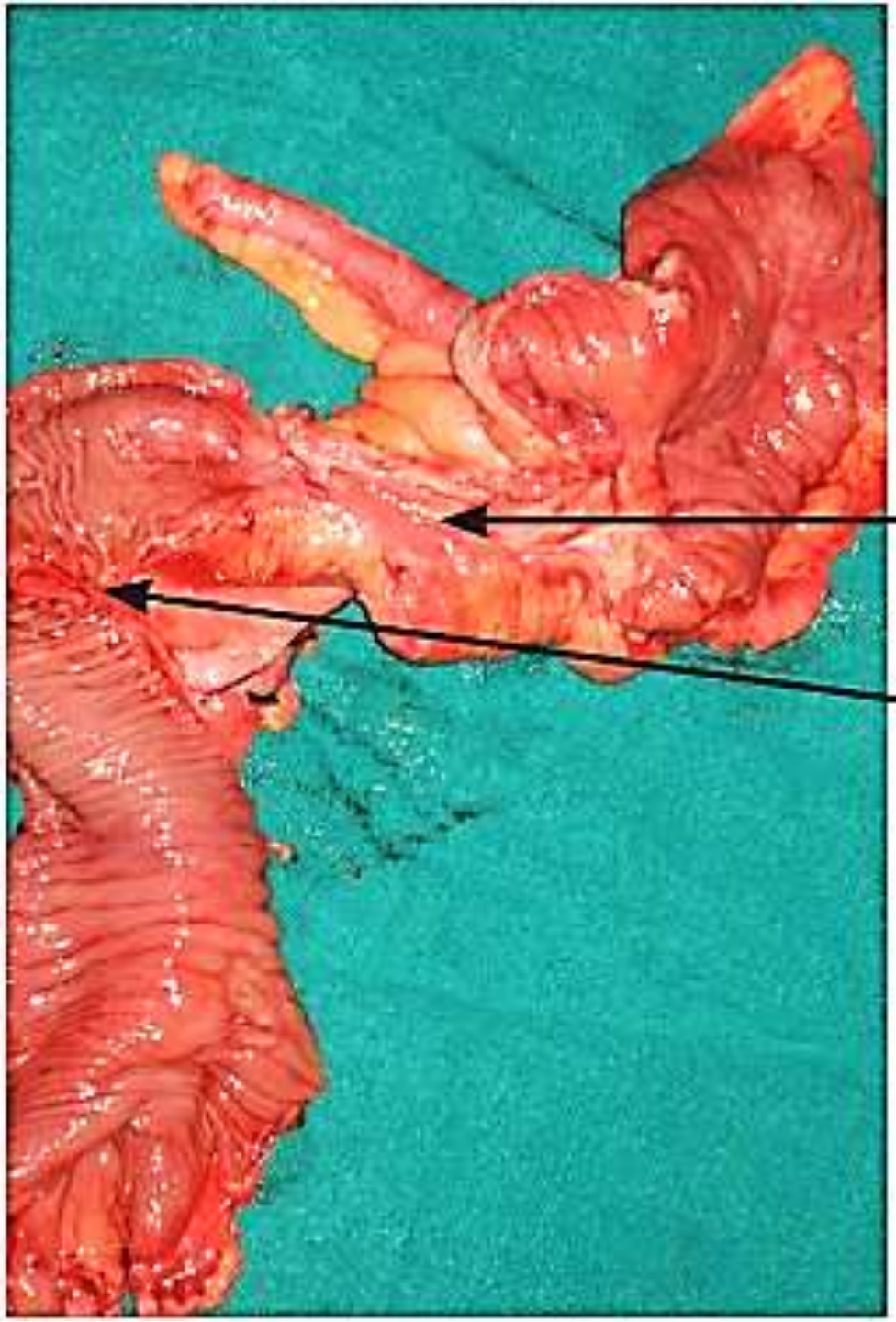
There are two types: ulcerative and hyperplastic. In both types, there may be marked mesenteric lymphadenopathy.

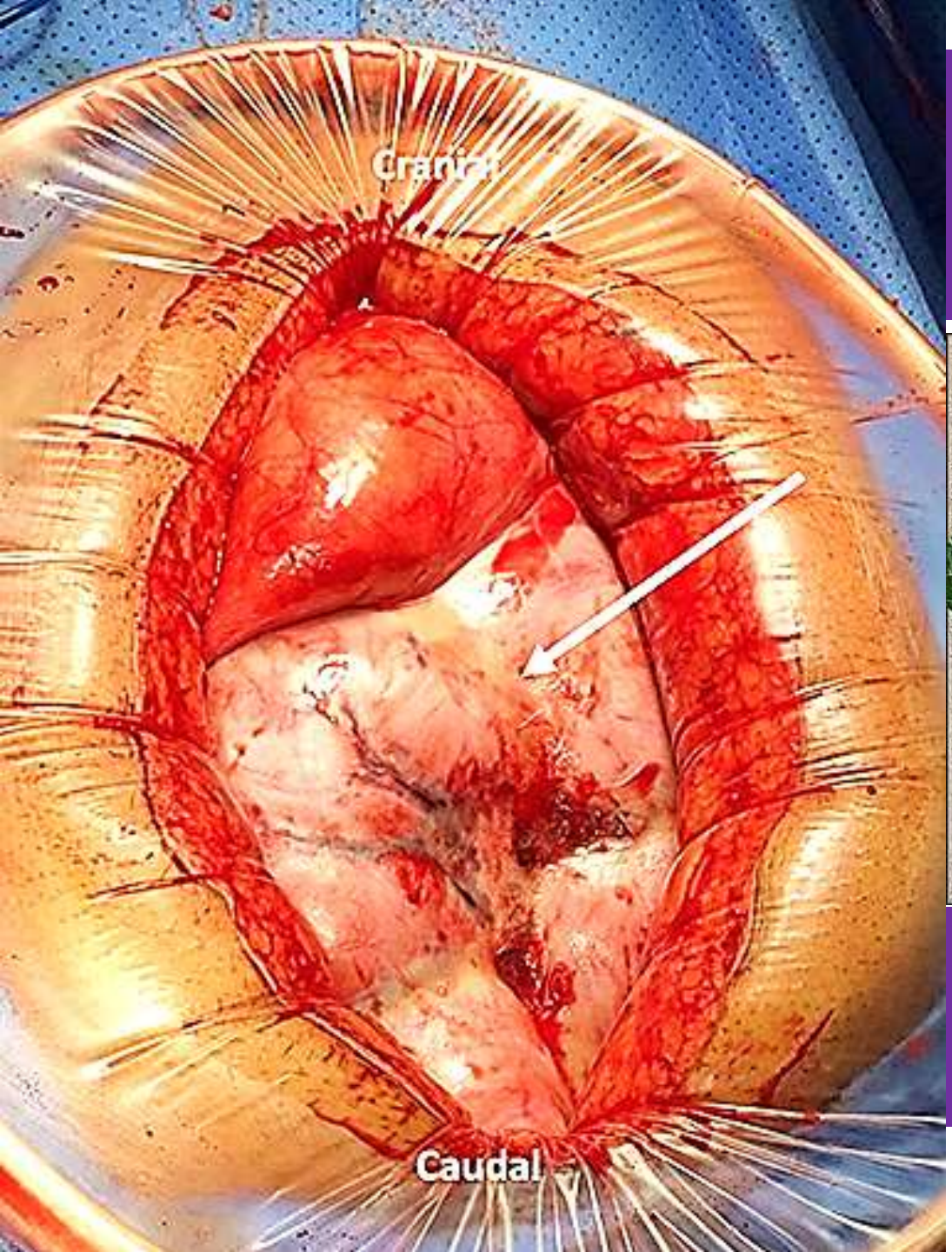
1) **Ulcerative type**: Colonisation the lymphatics of the terminal ileum, causing transverse ulcers with typical undermined edges. The serosa is usually studded with tubercles. Histology shows caseating granuloma with giant cells . It denotes a severe form (the virulence of the organism overwhelms host resistance) :

- The transverse ulcers is healed by **fibrosis** leading to multiple **strictures** (luminal narrowing) with presentation of **intestinal obstruction** (are) . Small bowel strictures are common .
- Perforation may occur , the pateint presented with (**peritonitis**) (are).

2) **Hyperplastic type**: A marked inflammatory hyperplasia and thickening of the terminal ileum (host resistance is over the virulence of the organism) because of its abundance of lymphoid follicles, resulting in narrowing of the lumen and **obstruction**.

- Ileocaecal tuberculosis : may present with a right iliac fossa mass and features of **intestinal obstruction**. DDX of : Crohn's disease, lymphoma , Ca , ameboema.
- As a result of fibrosis, there is shortening of the bowel with the caecum being pulled up into a subhepatic position with resultant widening of the ileocaecal angle beyond 90°.
- Encasement of bowel in a fibrotic sac (**cocoon**) may be seen in the plastic type of peritoneal tuberculosis, which presents with obstruction.


Stricture in the terminal ileum
Perforation in the terminal ileum



Laparotomy incision with wound protector showing a thick fibrous membrane encasing the small bowel resembling a cocoon (Arrow indicates the sac).

Abdominal cocoon or Sclerosing Encapsulating Peritonitis is due to thick fibrotic peritoneum encasing the small bowel in a small volume.

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- In peritoneal tuberculosis, the parietal and visceral peritoneum is studded with tubercles (tuberculoma) (DDX).
- Localised areas of ascites (loculated) depicts peritoneal involvement
- The lungs and other organs, particularly of the genitourinary system, may also be involved simultaneously

Intervention or local cause

- Peritoneal dialysis.
- Intraperitoneal chemotherapy.
- Trauma-related.
- Liver transplant.
- Abdominal surgery.

Systemic cases like Infection, Drugs, and Medical disease

- Abdominal tuberculosis
- Recurrent peritonitis
- Granulomatous peritonitis
- Beta-blocker
- Chemotherapy
- Asbestos exposure
- Endometriosis
- Liver cirrhosis
- Gastrointestinal malignancy

Abdominal cocoon
or
Sclerosing Encapsulating Peritonitis

Clinical features

- Increasingly being seen in non-endemic areas, mostly among
  immigrants from endemic areas.
- Patients is chronically ill, present electively with weight loss, chronic cough, malaise, evening rise in temperature with sweating, vague abdominal pain with distension and alternating constipation and diarrhoea. Abdomenal examination felt ‘doughy’ (areas of localised ascites).
- Rt I.F. mass (due to) .
- Some patients may present with fistula-in-ano (DDX), which is typically multiple with undermined edges and watery discharge.

- As an **emergency**:
  I. They present with features of distal small **bowel obstruction** (are) (due to).
  II. Rarely, a patient may present with features of peritonitis (features) from **perforation** of a tuberculous ulcer in the small bowel .

- Looking for other T.B. manifestations :
- Cervical LAP.
- Pulmonary symptoms .
- Genitourinary tract : the patient complains of frequency of micturition, with no abnormality in clinical examination does not show any.

Investigations

- As for tuberculous cervical lymph adenitis.
- A plain abdominal XR shows typical small bowel obstruction – valvulae conniventes (concertina effect) of dilated jejunum and featureless ileum with evidence of fluid between the loops.
- A barium meal and follow-through (or small bowel enema) shows strictures of the small bowel, particularly the ileum, typically with a high subhepatic caecum with the narrow ileum entering the caecum directly from below upwards in a straight line rather than at an angle .

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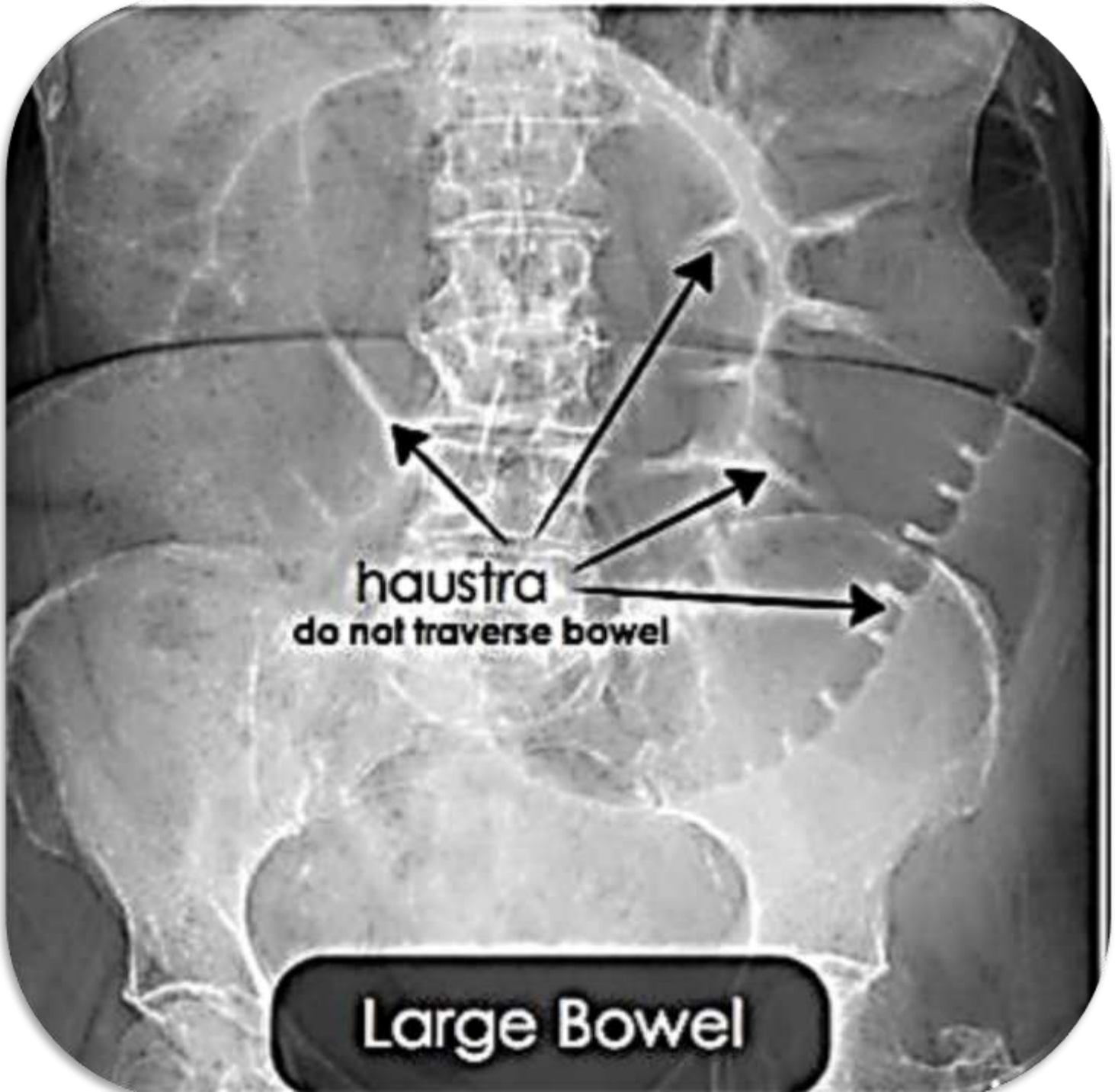
Small bowel obstruction

Dilated bowel

Valvulae conniventes

R


haustra
do not traverse bowel
Large Bowel

Series of a barium meal and follow-through showing strictures in the ileum, with the caecum pulled up into a subhepatic position.

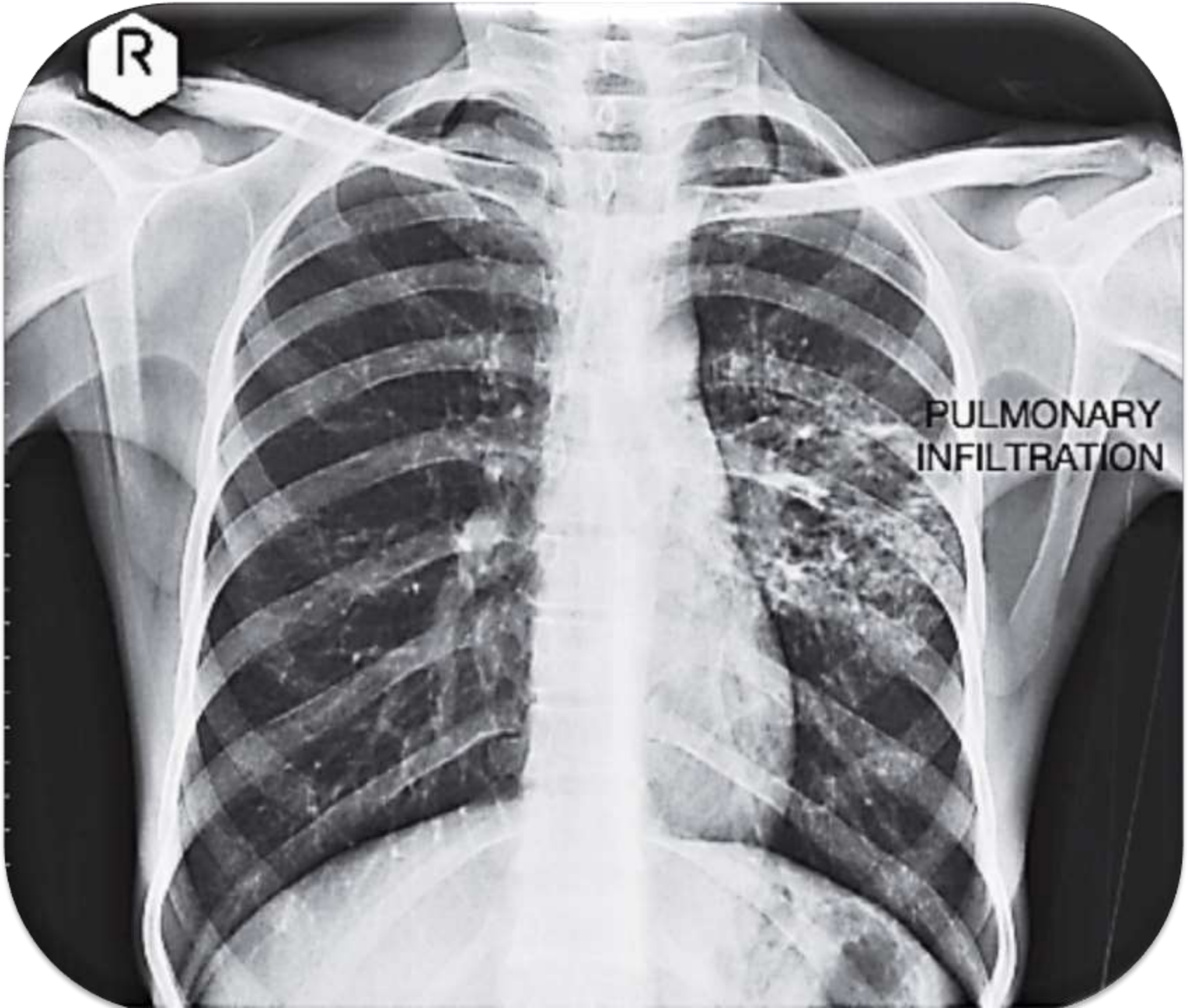

R
SUBHEPATIC
CAECUM

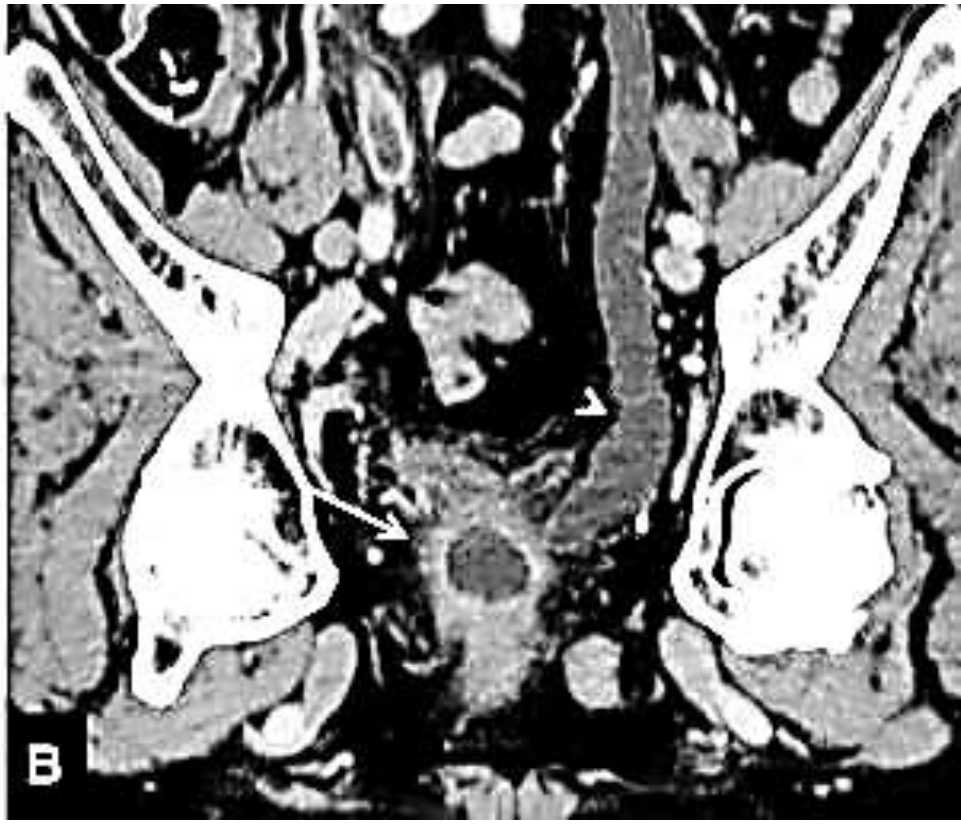

R
SUBHEPATIC
CAECUM

- Ultrasonography of the abdomen may show localised areas of ascites, contracted urinary bladder, dilated ureter (due to)
- Laparoscopy reveals the typical picture of tubercles on the bowel serosa and parietal peritoneum , multiple strictures, a high caecum, enlarged lymph nodes, areas of caseation and ascites. Culture of the ascitic fluid may be helpful.
- Plain CXR (pulmonary tuberculosis).
- Urinary symptoms :

  I. urine is sent for microscopy and culture; (sterile pyuria)should alert the clinician .

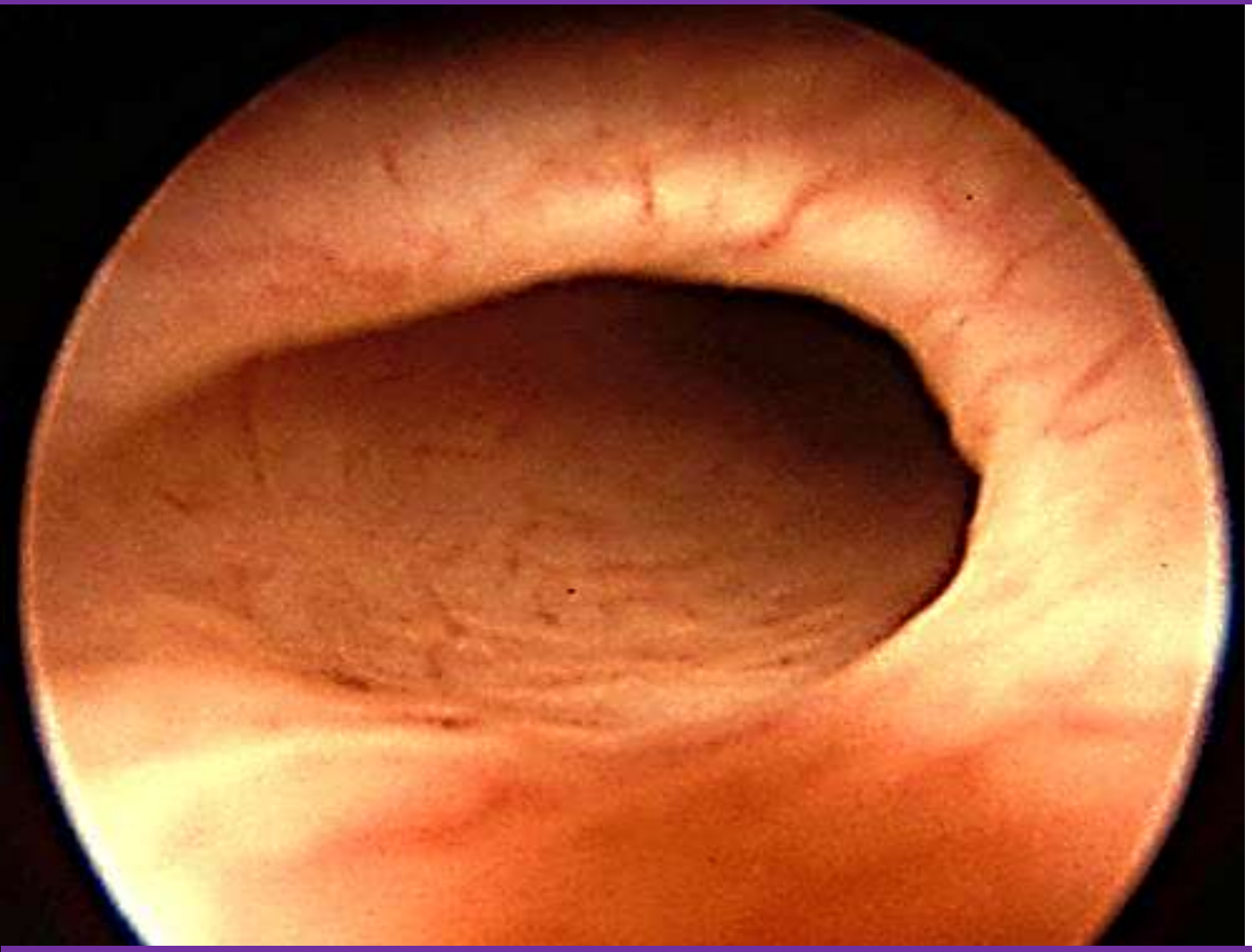
  II. A flexible cystoscopy : (A contracted bladder (‘thimble’ bladder) with in-drawn ureteric orifices that are (‘golf-hole’ ureter) (due to).
- In the patient presenting as an abdominal emergency, urea and electrolytes may show evidence of gross dehydration.


R
PULMONARY
INFILTRATION



Thimble bladder. Axial image (A) and curved MPR in the coronal plane (B) of the nephrographic phase in a 68-year-old man with treated UGTB. The bladder presents severe capacity reduction and markedly thickened walls due to fibrosis (arrows). The consequent stricture of the ureterovesical junction causes marked dilatation of the left ureter (arrowhead)

Ureteral orifice with reflux (golf hole) in cystoscop



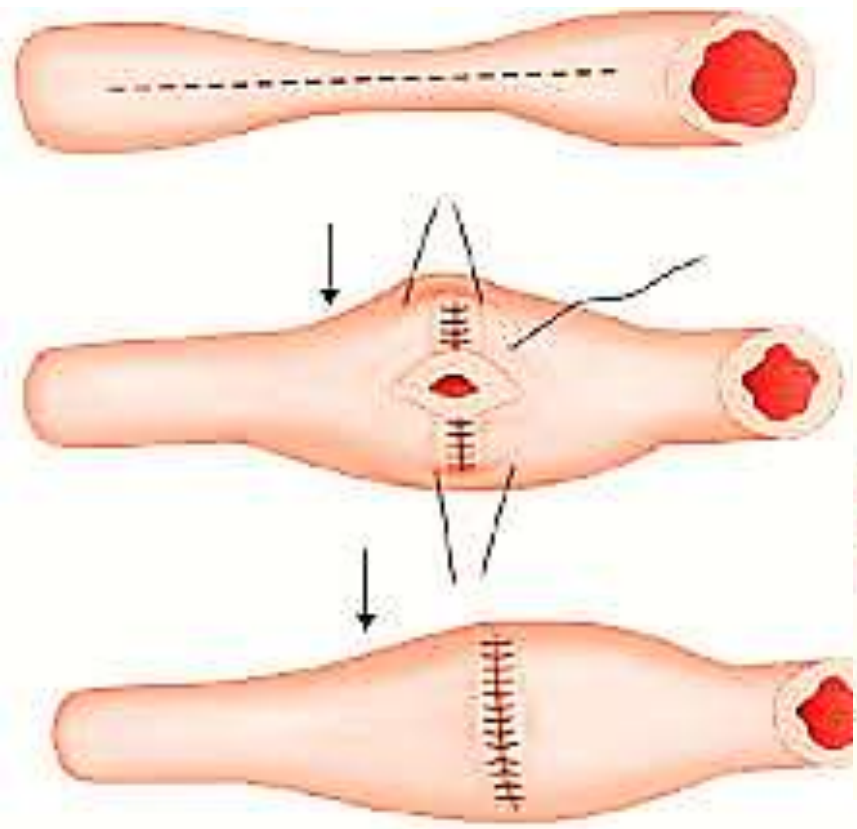
The ureter undergoes fibrosis and tends to be shortened and therefore straightened. This change leads to a “golf-hole” (gaping) ureteral orifice, typical of an incompetent valve.

Treatment (in the elective patient)

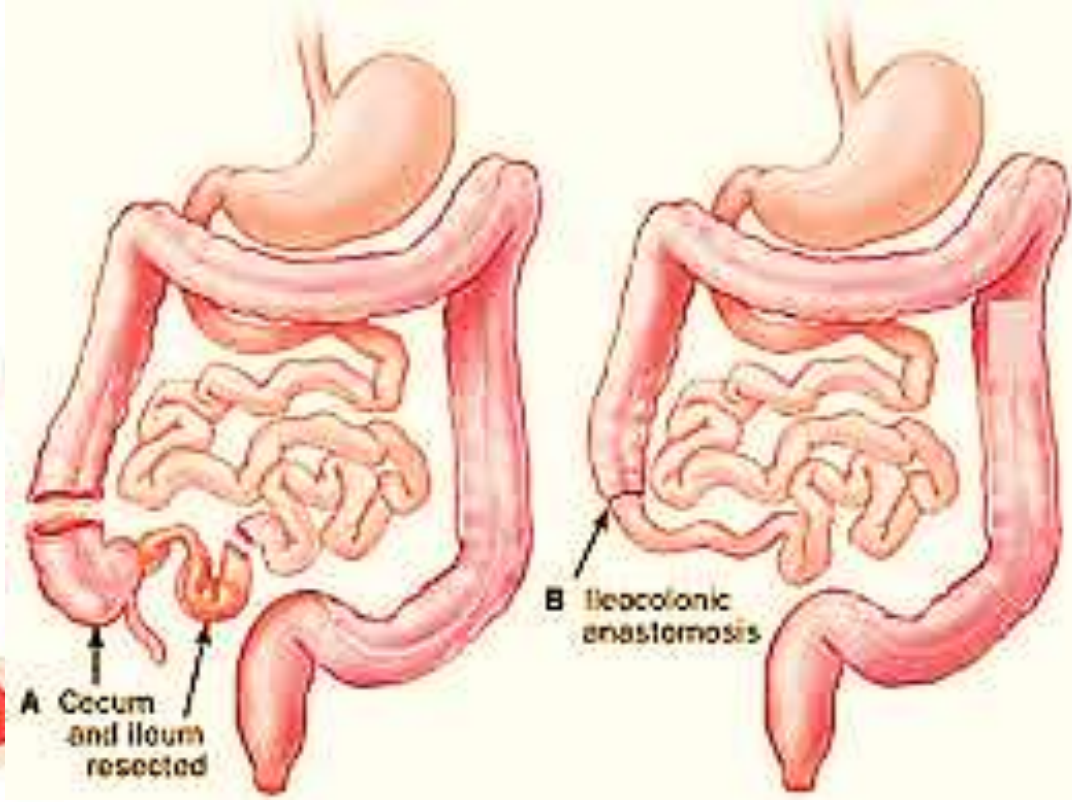
- Patients should ideally be under the combined care of a physician and surgeon.Vigorous supportive and full drug treatment are mandatory in all cases

- On completion of medical treatment, the patient's small bowel is reimaged to look for significant strictures. The surgical principles and options in the elective patient are very similar to those for Crohn's disease, where resections should be kept as conservative as possible. If the patient has features of subacute intermittent obstruction

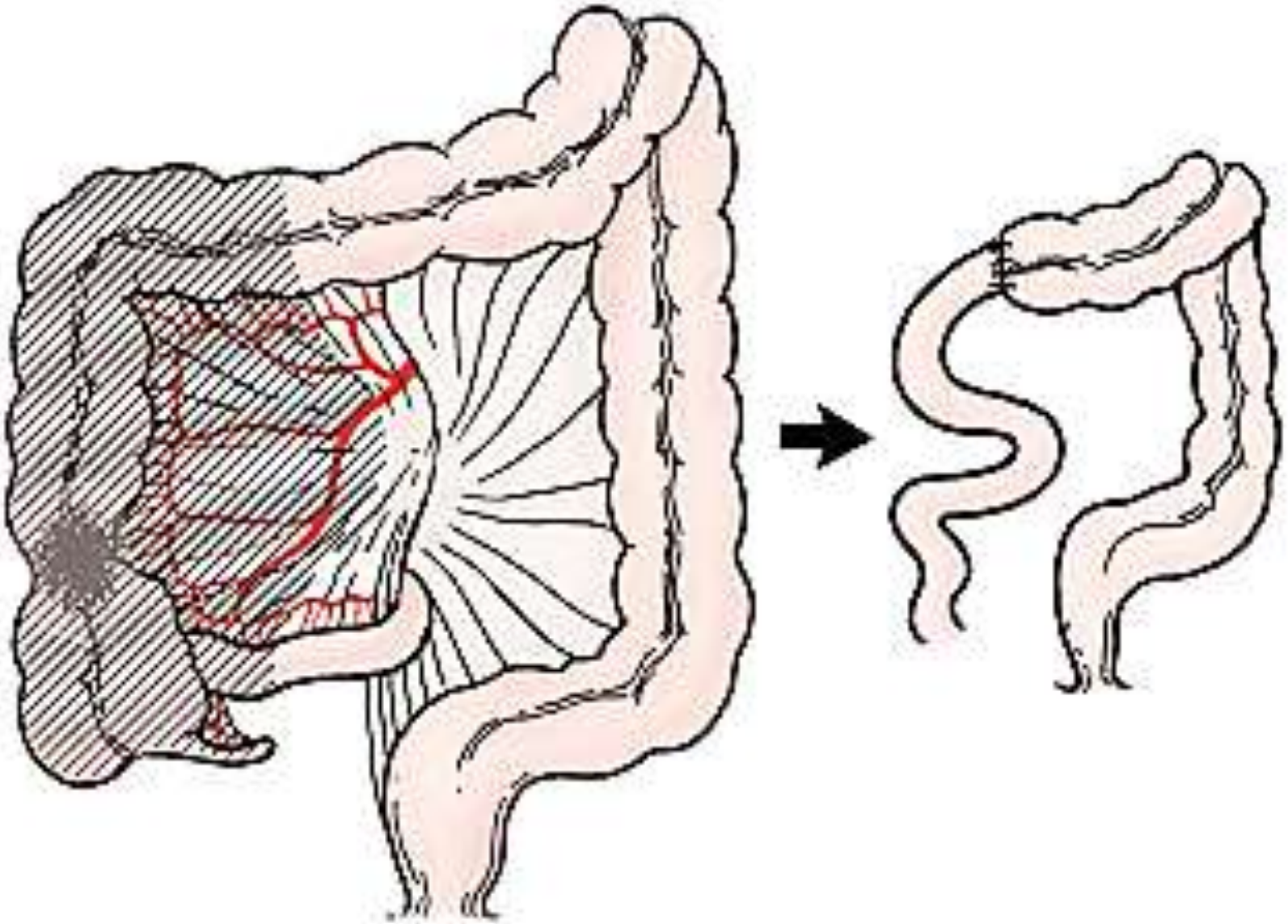
  1) Strictureplasty for single ileal stricture,
  2) Ileocolic resection with ileo-ascending colon anastomosis for limited ileocolic hyperplastic disease,
  3) Right hemicolectomy with ileo-transverse colon anastomosis for extensive ileocolic disease .
  4) Bowel resection with re-anastomosis for multiple closely placed strictures precluding limited resection, is performed as deemed appropriate.



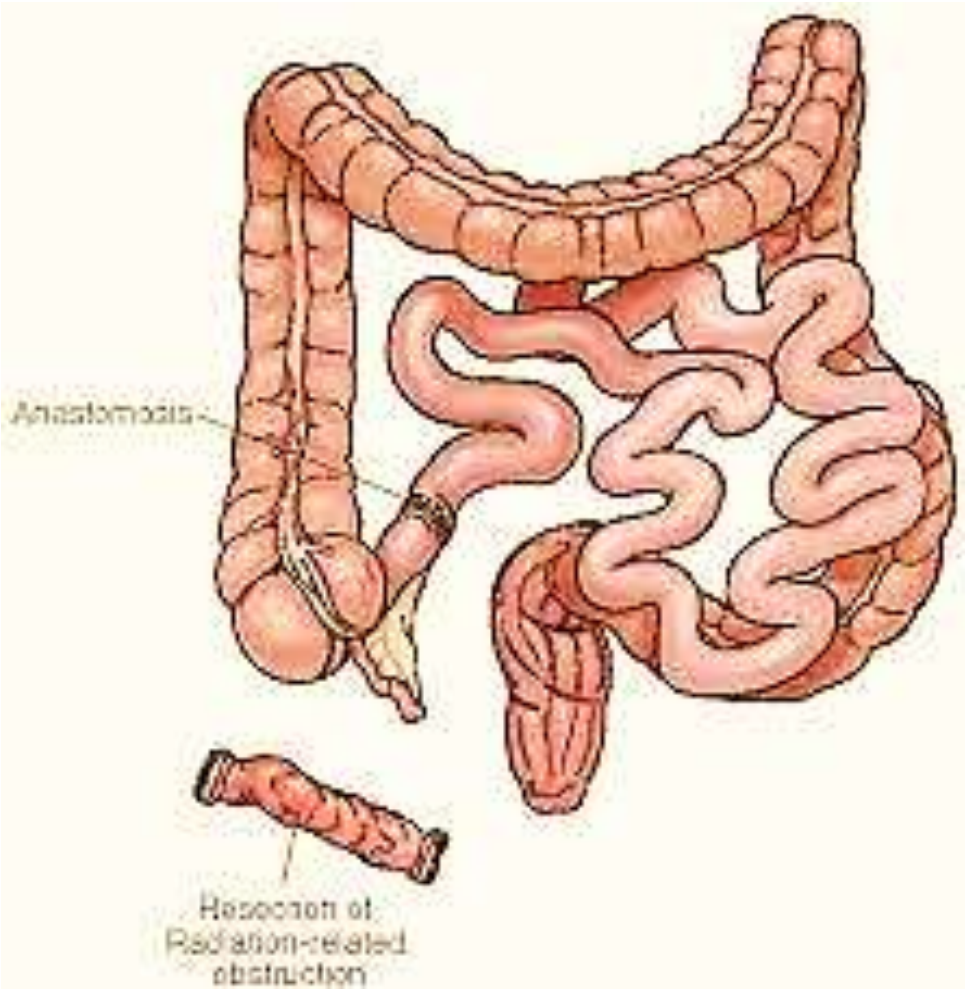
Strictureplasty



Ileocolic resection with ileo-ascending colon anastomosi



Rt hemicolectomy with ileo-transverse colon anastomosis.



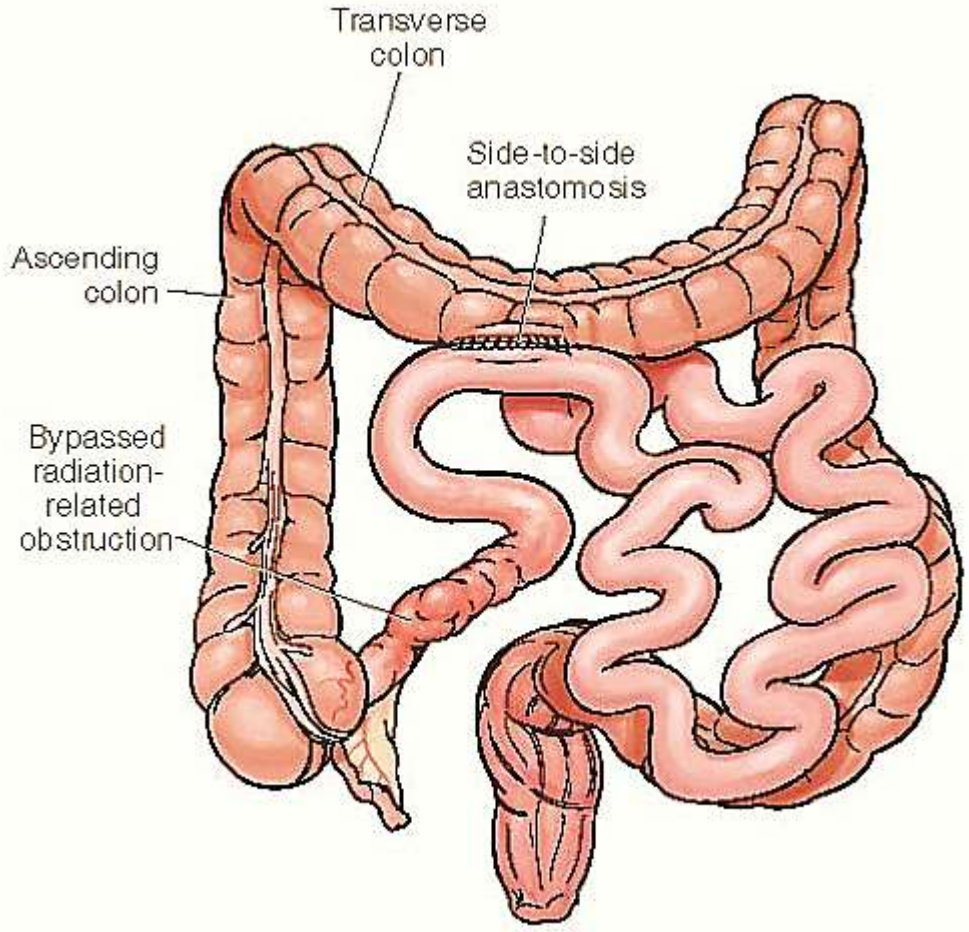
Segmental resection with end-end anastomosis for multiple closely placed strictures

Treatment (in the emergent patient)

- The emergency patient presents a great challenge. Such a patient is usually from a poor socioeconomic background, hence the late presentation of acute, distal, small bowel obstruction. The patient is extremely ill from dehydration, malnutrition (poor socioeconomic), anaemia and probably active pulmonary tuberculosis. Vigorous resuscitation should precede the operation

I. At laparotomy, the minimum life-saving procedure is carried out, for stricture such as :
   - A resection of diseased segment with proximal ileostomy and distal ileal or colonic mucus fistula to avoid anastomosis, which has a high chance of leaking in the presence of active infection and poor general condition.
   - If, however, the general condition of the patient permits, a one-stage resection and anastomosis may rarely be performed.

- A simple bypass procedure (ileo – tranasverse colon anastomosis (side to side).
- Then patient is reassessed and, when the disease is no longer active (as evidenced by return to normal inflammatory markers, weight gain, negative sputum culture), an elective right hemicolectomy is done to remove the blind loop. This may be supplemented with strictureplasty for short strictures at intervals or resection of a segment with several strictures.



Bypass procedure (ileo – tranasverse colon anastomosis (side to side)

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II. Perforation : After thorough resuscitation followed by:

- Resection of the affected segment and (when peritoneal contamination is minimal and widespread disease is not encountered).
- Resection and ileostomy with mucus fistula (as a first stage), (profound peritoneal contamination and widespread disease) followed by restoration of bowel continuity (as a second stage) later on after a full course of antitubercular chemotherapy and improvement in nutritional status.

- Thereafter, the patient should ideally be under the combined care of the physician and surgeon for a full course of standard multidrug antitubercular chemotherapy (intensive and maintenance phases) and improvement in nutritional status, which may take up to 6–12 months.

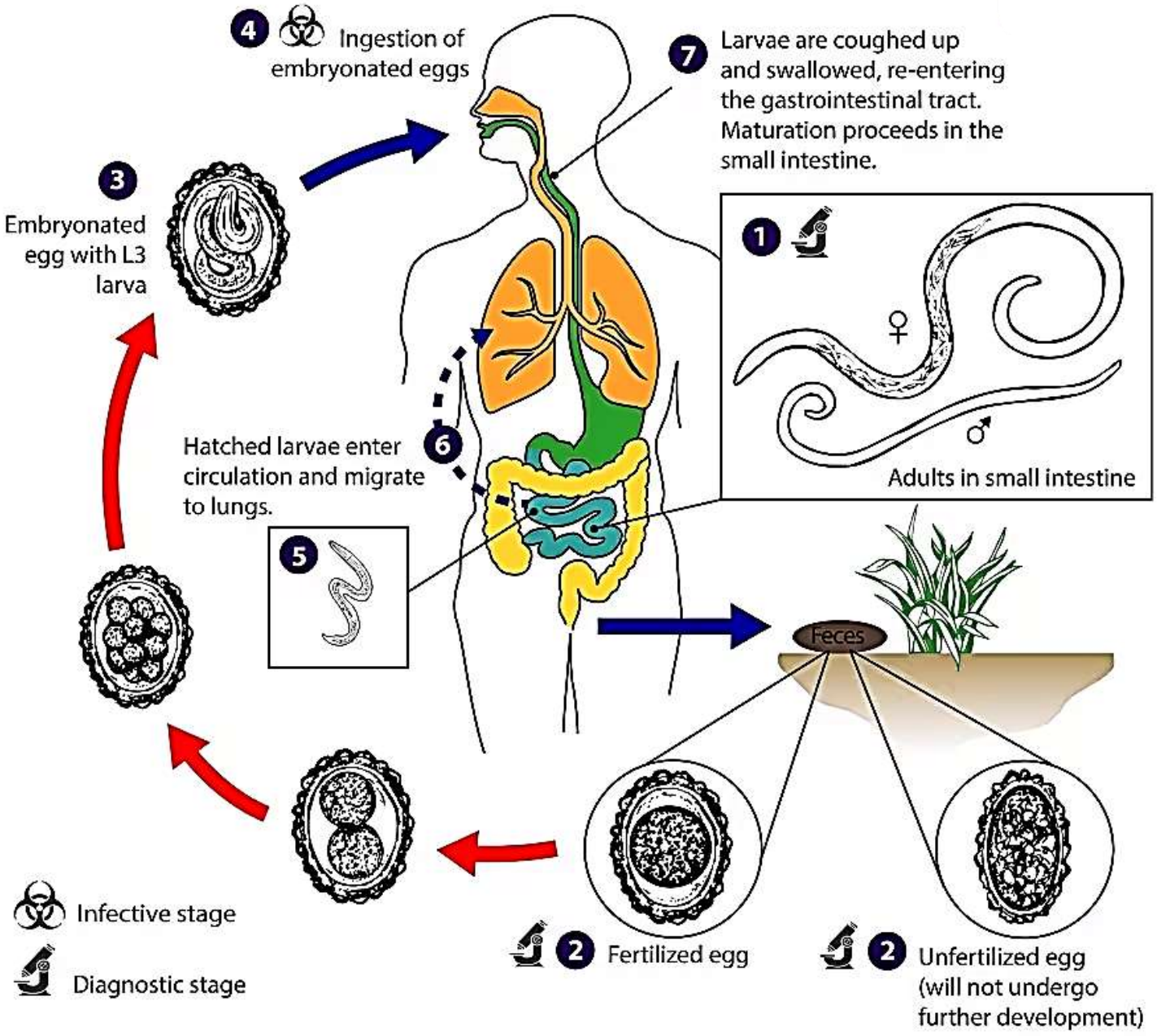
(ASCARIS LUMBRICOIDES)

- Ascaris lumbricoides (Roundworms (Nematodes)) .
- It is the commonest intestinal nematode to infect humans.
- Faecal–oral contamination causes human infection.

Pathology and life cycle

- The fertilised eggs can survive in a hostile environment (soil contaminated with infected faeces for a long time, in hot and humid conditions turning them into embryos ,becoming infective in about 3 weeks.
- The adult worm can grow up to 45 cm long in small bowel.

Ascaris lumbricoides



- The eggs are ingested and the larvae are released in the **jejunum**, from where they travel to :
  1) Liver (the portal system and the lymphatics)
  2) Lungs (the systemic circulation) undergo maturation for 2 weeks.
- Finding their way into the small intestine and continue their maturation
  a) From alveoli , beeing coughed up, and swallowed .
  b) Young worms migrate from the tracheobronchial tree into the oesophagus.
- Then they can migrate to :
  - the common bile duct (a nidus for a stone). or pancreatic duct.
- The mature female, once in the small bowel, produces innumerable eggs that are fertilised and thereafter excreted in the stool to perpetuate the life cycle.

Clinical Features

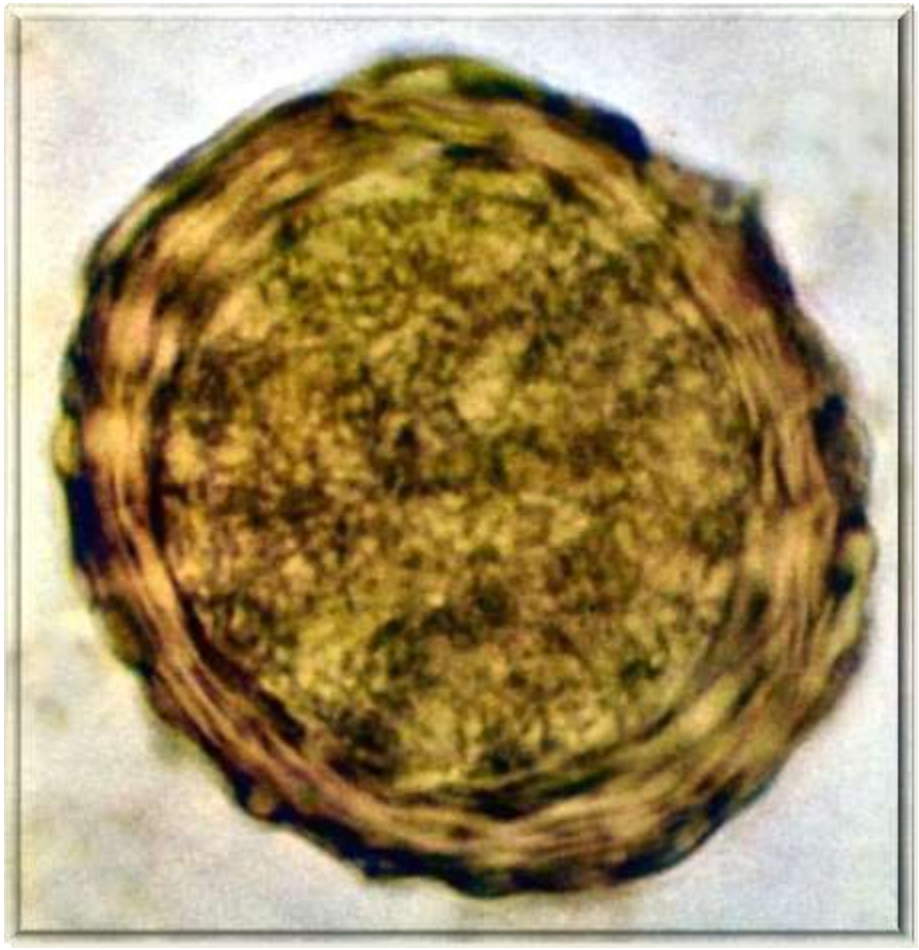
A high index of suspicion (ascariasis should be high on the list of possible diagnoses) is not to miss the diagnosis, if a person from a tropical country, recently has returned from an endemic area, presenting with pulmonary, gastrointestinal, hepatobiliary and pancreatic symptoms,

- Pulmonary : dry cough, chest pain, dyspnoea and fever – referred to as Loeffler's syndrome.
- Ascending cholangitis and obstructive jaundice (why), (features)
- Acute pancreatitis (why), (features)
- Small intestine :
  - Malnutrition, failure to thrive, particularly in children, and abdominal pain.
  - Small intestinal obstruction particularly in children, (a bolus of adult worms incarcerated in the terminal ileum. (surgical emergency).
  - Rarely, perforation of the small bowel (surgical emergency) due to ischaemic pressure necrosis from the bolus of worms (peritonitis). (features).

Investigation

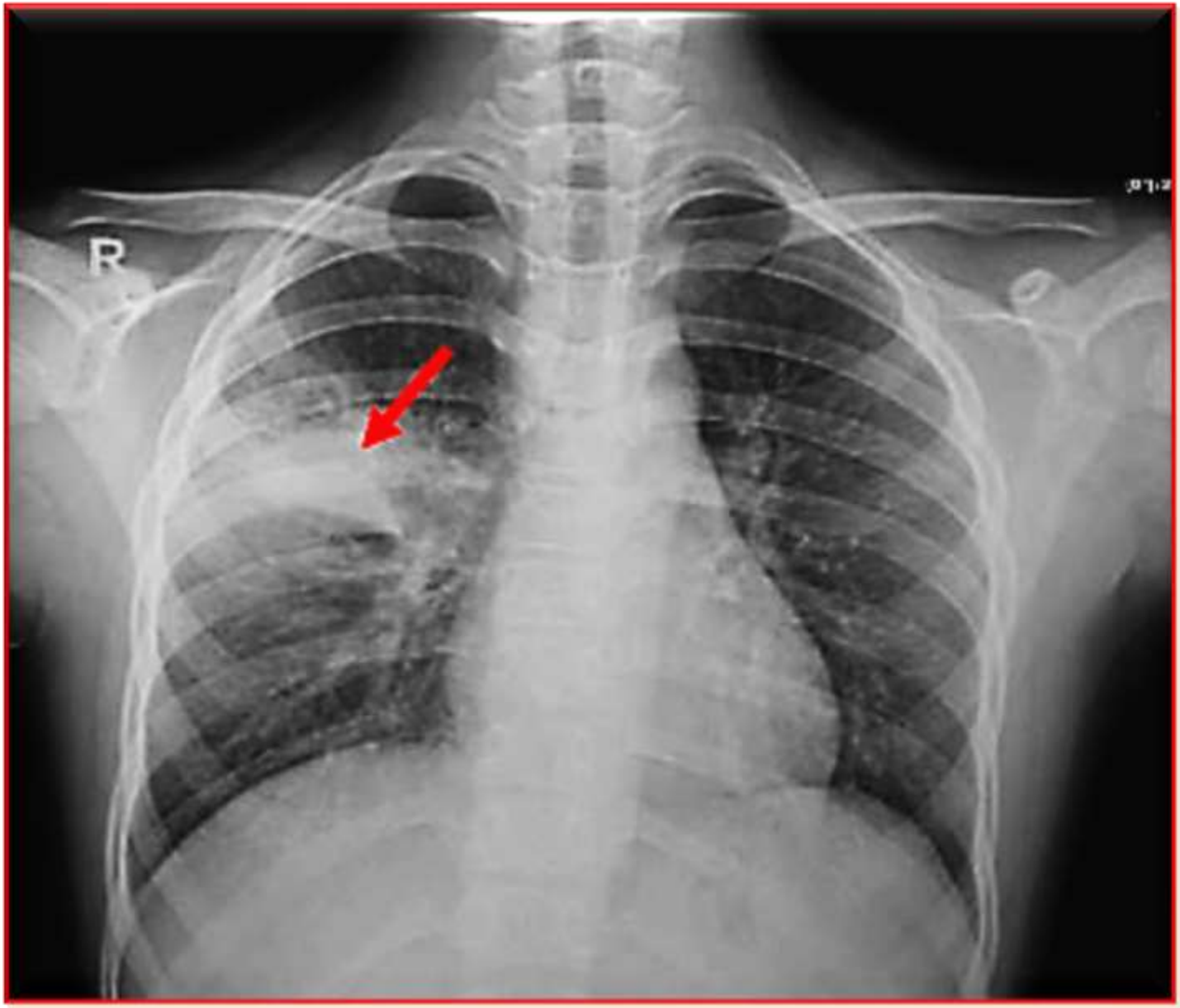
- Eosinophilia is common (As with most parasitic infestations) .
- G.Stool examination may show ova.
- Sputum or bronchoscopic washings may show Charcot–Leyden crystals or the larvae.
- Chest X R may show flufy exudates in Loeffler’s syndrome.
- A barium meal and follow-through may show a bolus of worms in the ileum or lying freely within the small bowel .
- Ultrasonography may show a worm in the gallbladder, the common bile duct or pancreatic duct.
- Plain abdominal radiograph may show tubular structures within dilated small bowel, denoting the presence of worms (features of intestinal obstruction)
- Contrast abdominal CT scan which would also show up as curvilinear structures within dilated small bowel.
- (MRCP), magnetic resonance cholangiopancreatography an adult worm may be seen in the common bile duct (features of obstructive jaundice).

G.S.E. for Ascaris lumbricoides

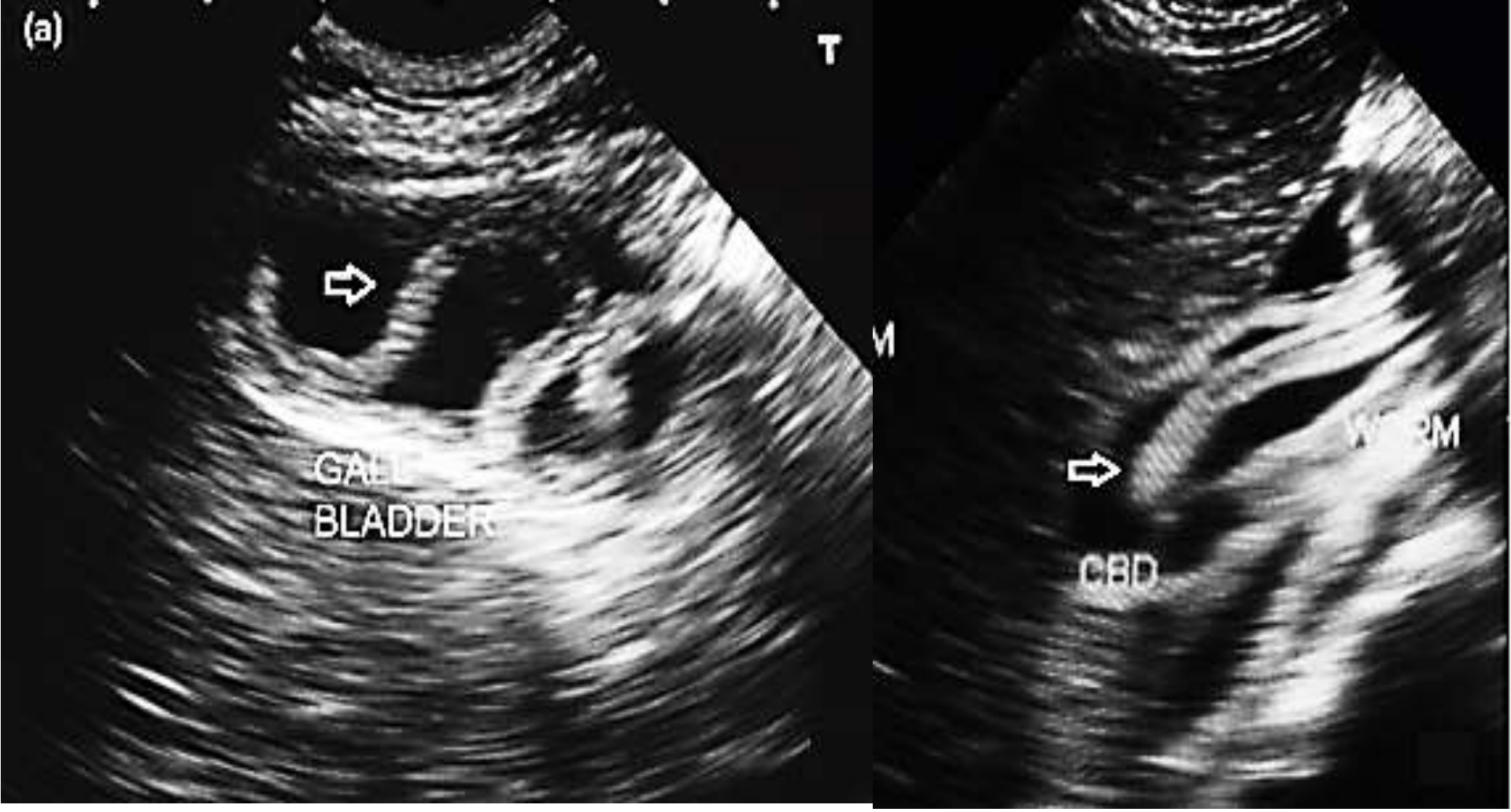


Fertile egg in human faeces

Infertile egg

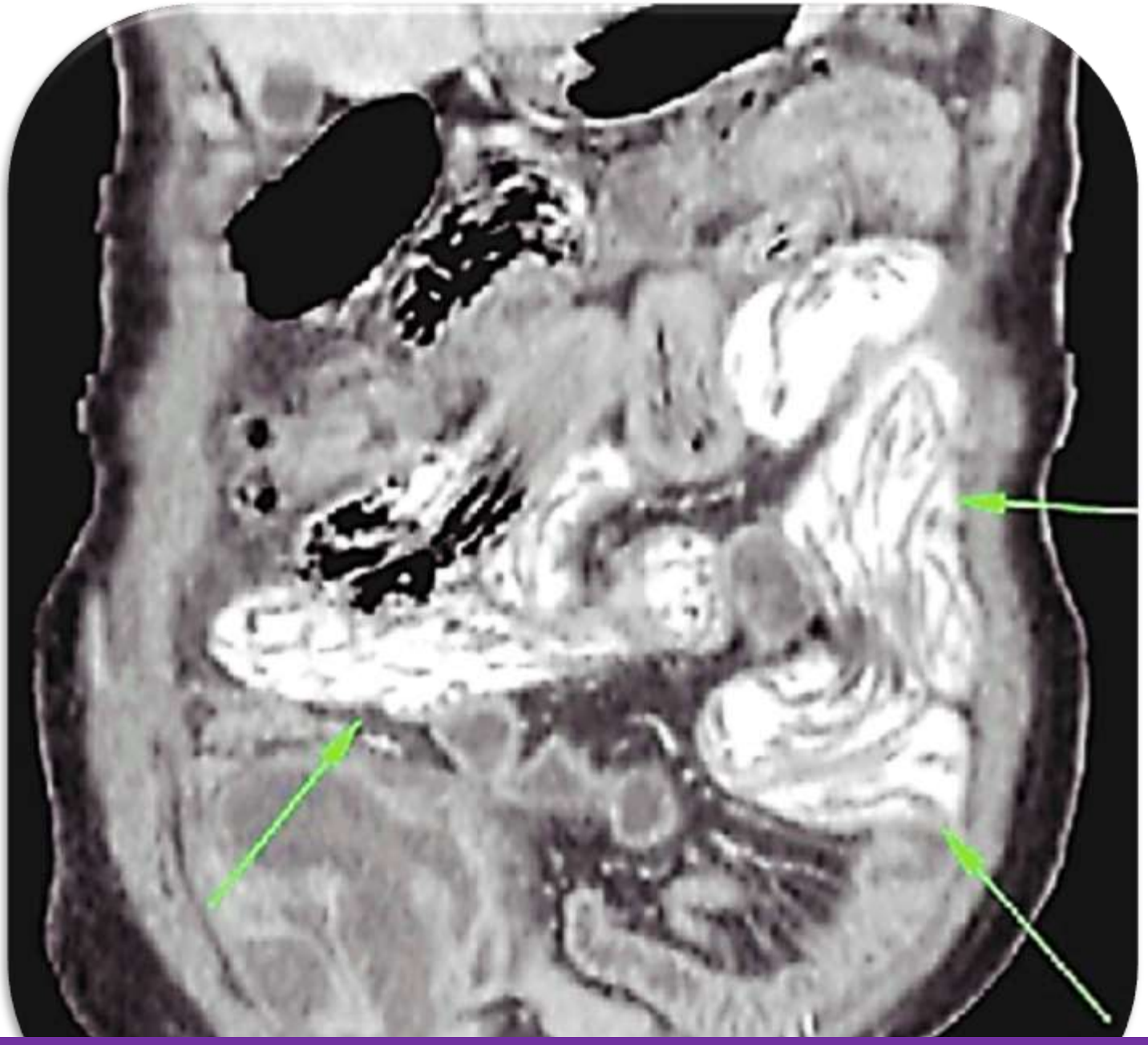


Loeffler's syndrome: a type of eosinophilic pneumonia mimicking community-acquired pneumonia and asthma that arises from Ascaris lumbricoides in a child.

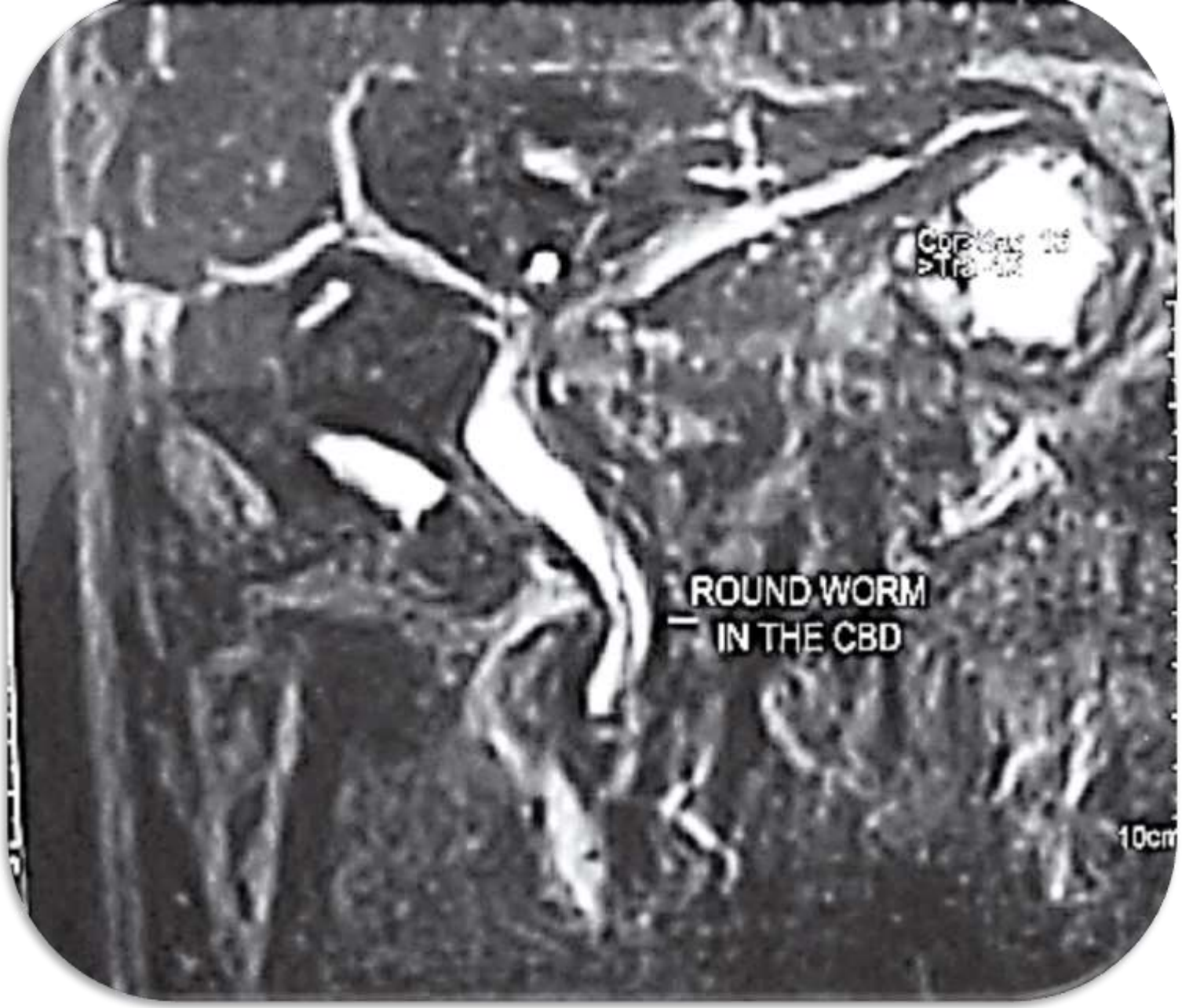


Ultrasound scan showing a live worm (arrow) in the gallbladder (a) and the common bile duct (CBD) (b)

Barium meal and follow-through showing roundworms in the course of the small bowel with barium seen inside the .



Coronal CT image showing the worms (curvilinear structures) appearing in numerous thin band patterns in the cecal and jejunal segments (green arrows).



MRCP : showing a roundworm in the common bile duct (CBD). The worm could not be removed endoscopically. The patient underwent an open cholecystectomy and exploration of the CBD

Treatment

- **The pulmonary phase** : is usually self-limiting and requires symptomatic treatment only.
- **Intestinal phase**: care of a physician for treatment with anthelminthic drugs.
- acute intestinal obstruction :
  - Children who present with features of intermittent or subacute obstruction should be given a trial of conservative management in the form of intravenous fluids, nasogastric suction . Hypertonic saline enemas(to disentangle the bolus of worms and also increases intestinal motility) .
  - (Post medical therapy intestinal obstruction) from a bolus of dead worms.

Treatment (Surgery is reserved for complications:)

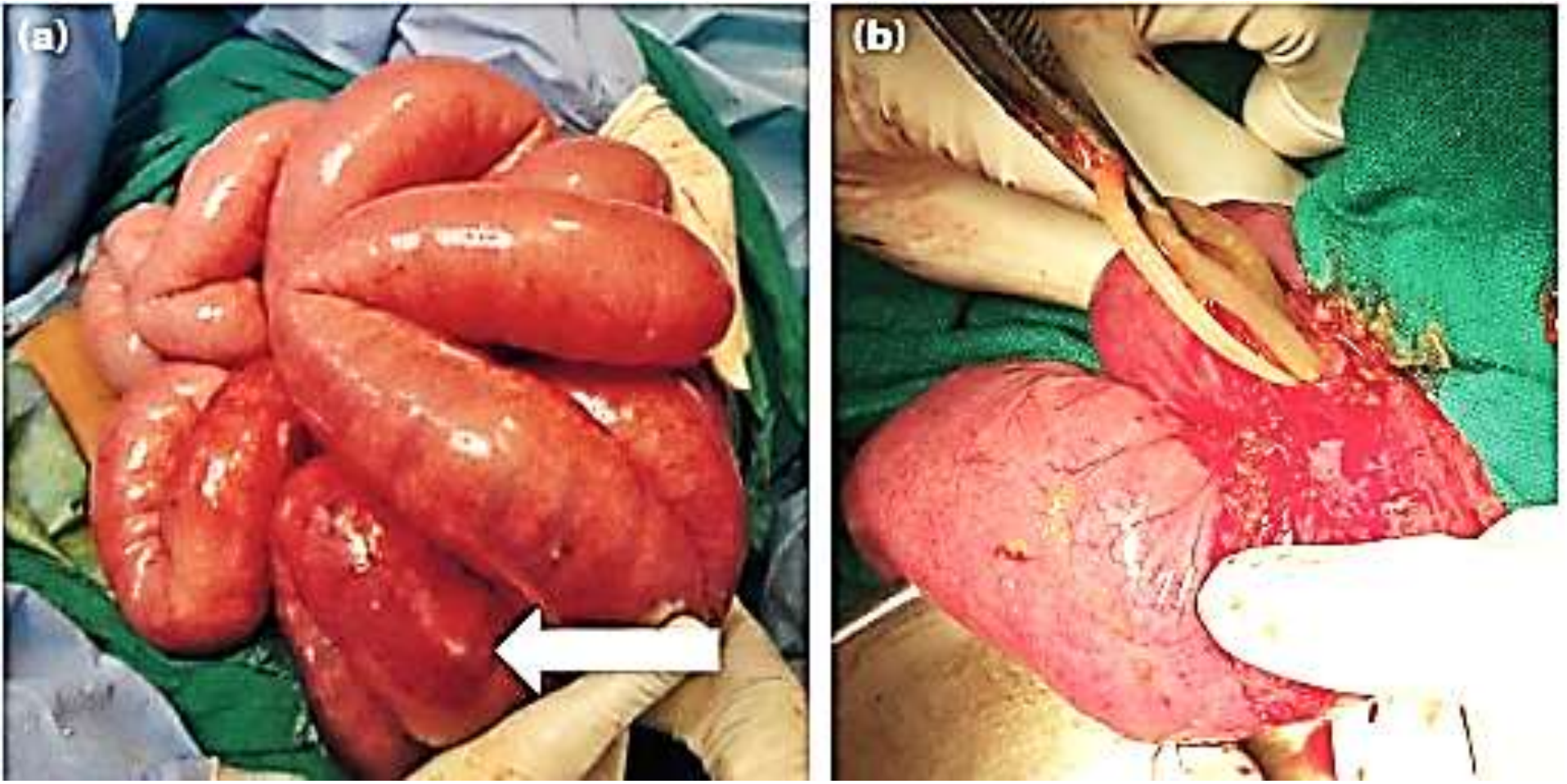
- When a patient is operated upon as an emergency for a suspected complication of roundworm infestation, the actual diagnosis at operation may turn out to be :
  - Acute appendicitis.
  - typhoid perforation.
  - tuberculous stricture.

- The presence of roundworms is an incidental finding. Such a patient requires the appropriate surgery depending upon the primary pathology.

Treatment (Surgery is reserved for complications:)

1) Intestinal obstruction that has not resolved on a conservative regime. At laparotomy:
   - **Milking** bolus of worms in the terminal ileum through the ileocaecal valve into the colon for natural passage in the stool.
   - If the bowel wall is healthy, **Enterotomy** performed with removal of the worms .

   (Postoperatively, hypertonic saline enemas may help in the extrusion of the worms).
2) Intestinal perforation : (the parasites is found free in the peritoneal cavity). It is safer to bring out the site of perforation as an ileostomy rather than resection and anastomosis to prevent risk of break out) .



(a) Roundworms seen through the bowel wall (arrowed). (b) Roundworm being removed through enterotomy.

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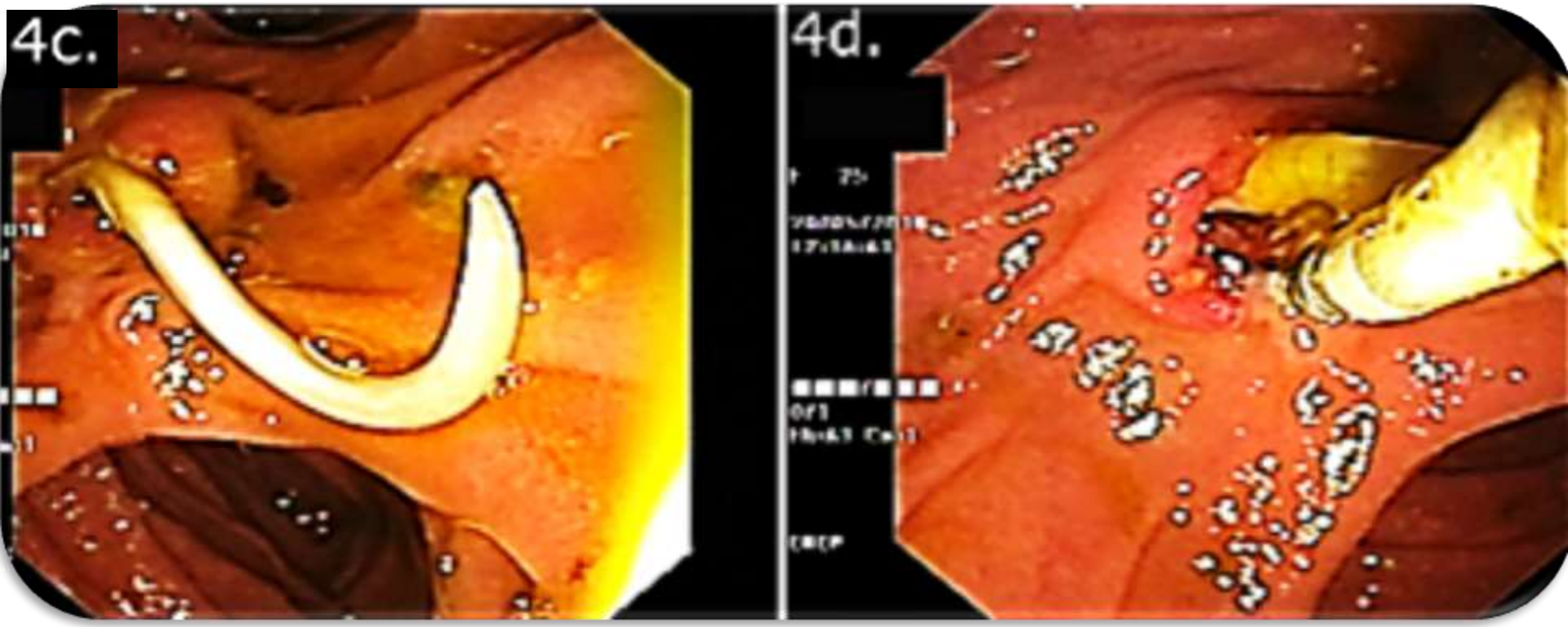
3) Strictures, gangrenous areas or perforations need resection and anastomosis.
4) C.B.D.or pancreatic duct obstruction can be treated by:
   - ❖ Endoscopic removal at (ERCP). If failed then :
   - ❖ Laparoscopic or open exploration of the common bile duct is necessary. Cholecystectomy is also carried out.

- ❑ A full course of antiparasitic treatment must follow any surgical intervention.



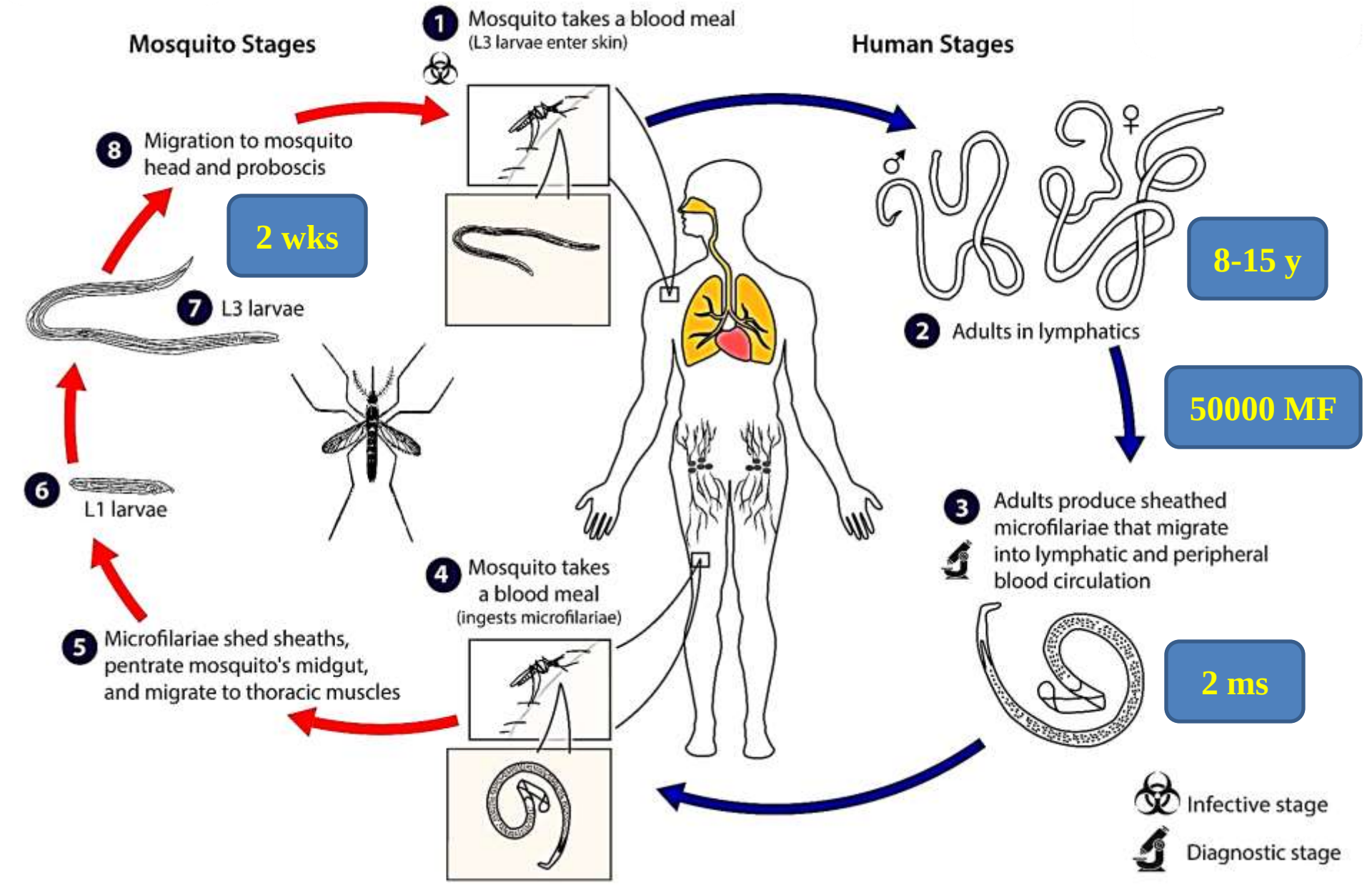
Biliary ascariasis in a 24-year-old female patient. c) A worm protruding out of the ampulla at ERCP. d) Removal of worms with balloon sweep and grasping forceps.

LYMPHATIC FILARIASIS

- Roundworms (Nematodes).
- 90% is caused by nematodes Wuchereria bancrofti , (others Brugia malayi and Brugia timori), which is transmitted by the mosquito
- Once the host has been bitten by the mosquito sting The matured eggs enter the human circulation after, to hatch and grow into adult worms; takes almost a year, mainly colonise the lymphatic system.
- The condition of filariasis is clinically very obvious, and thus investigations in the full-blown case are superfluous.

❑ (DDX from other causes of lymph edema).

Wuchereria bancrofti



The Life Cycle of Lymphatic Filariasis

MOSQUITO STAGES

7 Larvae migrate to a mosquito's head and proboscis.

8 An infected mosquito continues the cycle.

HUMAN STAGES

1 An infected mosquito deposits larvae on the skin while biting, and the larvae enter the wound.

An infected mosquito starts the cycle

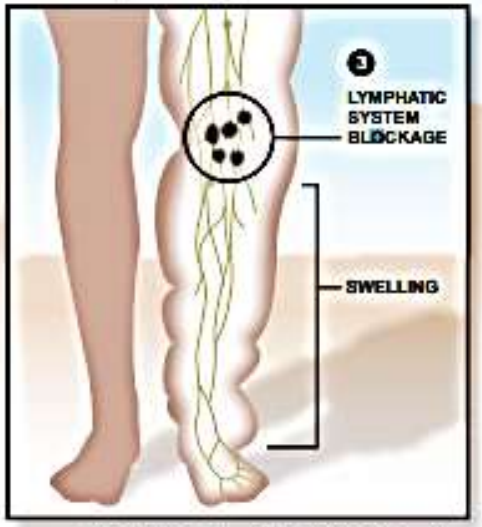
LYMPH NODES AND VESSELS

2 Larvae migrate to vessels and nodes of the lymphatic system, where they develop into thread-like adult worms.

♂ ♀

ADULT WORMS

3 Adult worms, which typically live five to seven years, damage the lymphatic system, causing infections that result in blockages, swelling, and fevers.



BLOOD STREAM

4 Fertilized female worms release embryonic offspring, called microfilariae, that enter the blood stream. They circulate at night, when mosquitoes bite, in blood vessels near the skin.

5 A mosquito, feeding on the blood of an infected person, ingests microfilariae, becoming infected.

Another mosquito becomes infected, continuing the cycle

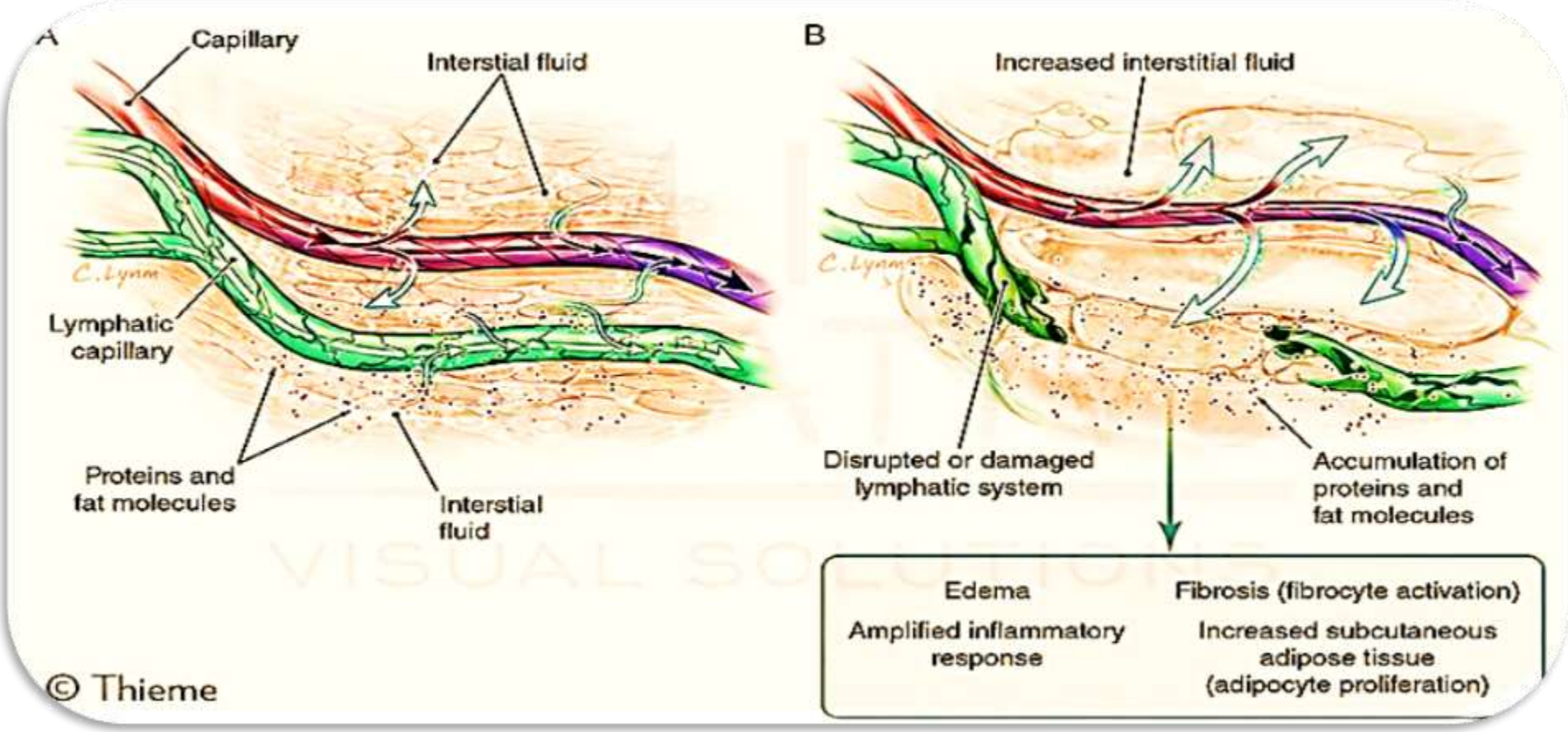
6 In several stages, inside a mosquito's midgut, microfilariae develop into infectious larvae.

L3 LARVAE

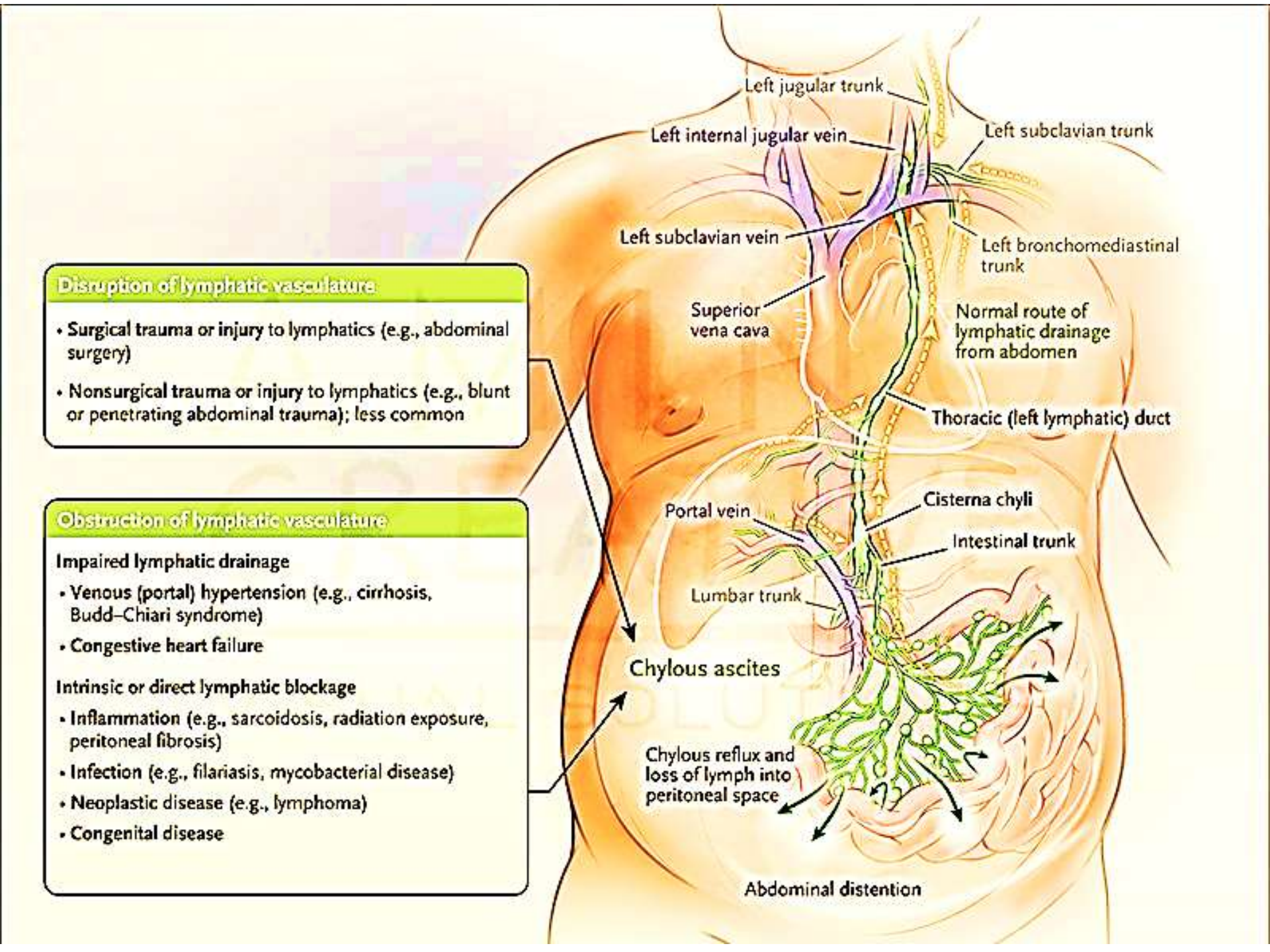
L1 LARVAE

SOURCE: *Centers for Disease Control and Prevention*

The Carter Center / Graphic by Al Granberg



- The adult worms cause lymphatic obstruction, resulting in massive lower limb oedema. thickening, not unlike the peau d'orange appearance in breast cancer, thus exacerbating the limb swelling with progressive lymphatic fibrosis grossly swollen limb with thickened skin, producing the condition of elephantiasis .
- Secondary streptococcal infection is common.
- Bilateral lower limb filariasis is often associated with scrotal and penile elephantiasis. Early on, there may be a hydrocele underlying scrotal filariasis .


Left jugular trunk
Left internal jugular vein
Left subclavian trunk
Left subclavian vein
Left bronchomediastinal trunk
Superior vena cava
Normal route of lymphatic drainage from abdomen
Thoracic (left lymphatic) duct
Portal vein
Cisterna chyli
Intestinal trunk
Lumbar trunk
Chylous ascites
Chylous reflux and loss of lymph into peritoneal space
Abdominal distention
Disruption of lymphatic vasculature
• Surgical trauma or injury to lymphatics (e.g., abdominal surgery)
• Nonsurgical trauma or injury to lymphatics (e.g., blunt or penetrating abdominal trauma); less common
Obstruction of lymphatic vasculature
Impaired lymphatic drainage
• Venous (portal) hypertension (e.g., cirrhosis, Budd–Chiari syndrome)
• Congestive heart failure
Intrinsic or direct lymphatic blockage
• Inflammation (e.g., sarcoidosis, radiation exposure, peritoneal fibrosis)
• Infection (e.g., filariasis, mycobacterial disease)
• Neoplastic disease (e.g., lymphoma)
• Congenital disease

Clinical features

- It is mainly males who are affected because females generally cover a greater part of their bodies with .
- Acute attacks : fever with lymphadenitis and lymphangitis.
- Occasionally, adult worms may be felt subcutaneously (dance sign refers to a twirling motion) .
- Chronic manifestations appear after repeated acute attacks over several years.

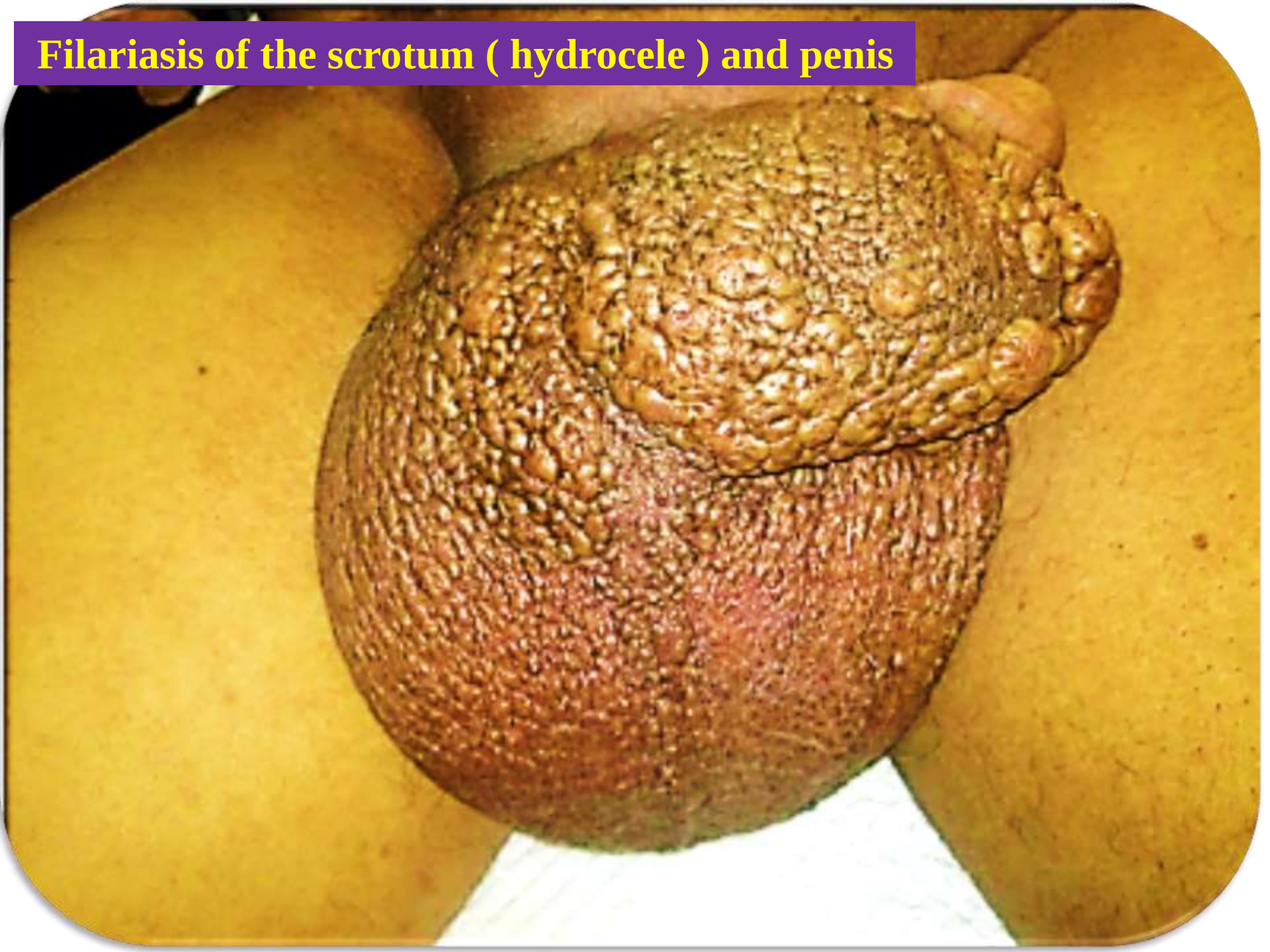
- Chyluria (features).
- Chylous ascites (features).
- Respiratory tract, : dry cough, chylothorax (?) wheezing, chest pain hemoptysis &(tropical pulmonary eosinophilia).
- Lower limb non pitting edema (elephantiasis) causing long-term disability.

❑ The parasite may also be seen in chylous urine, ascites and hydrocele fluid.

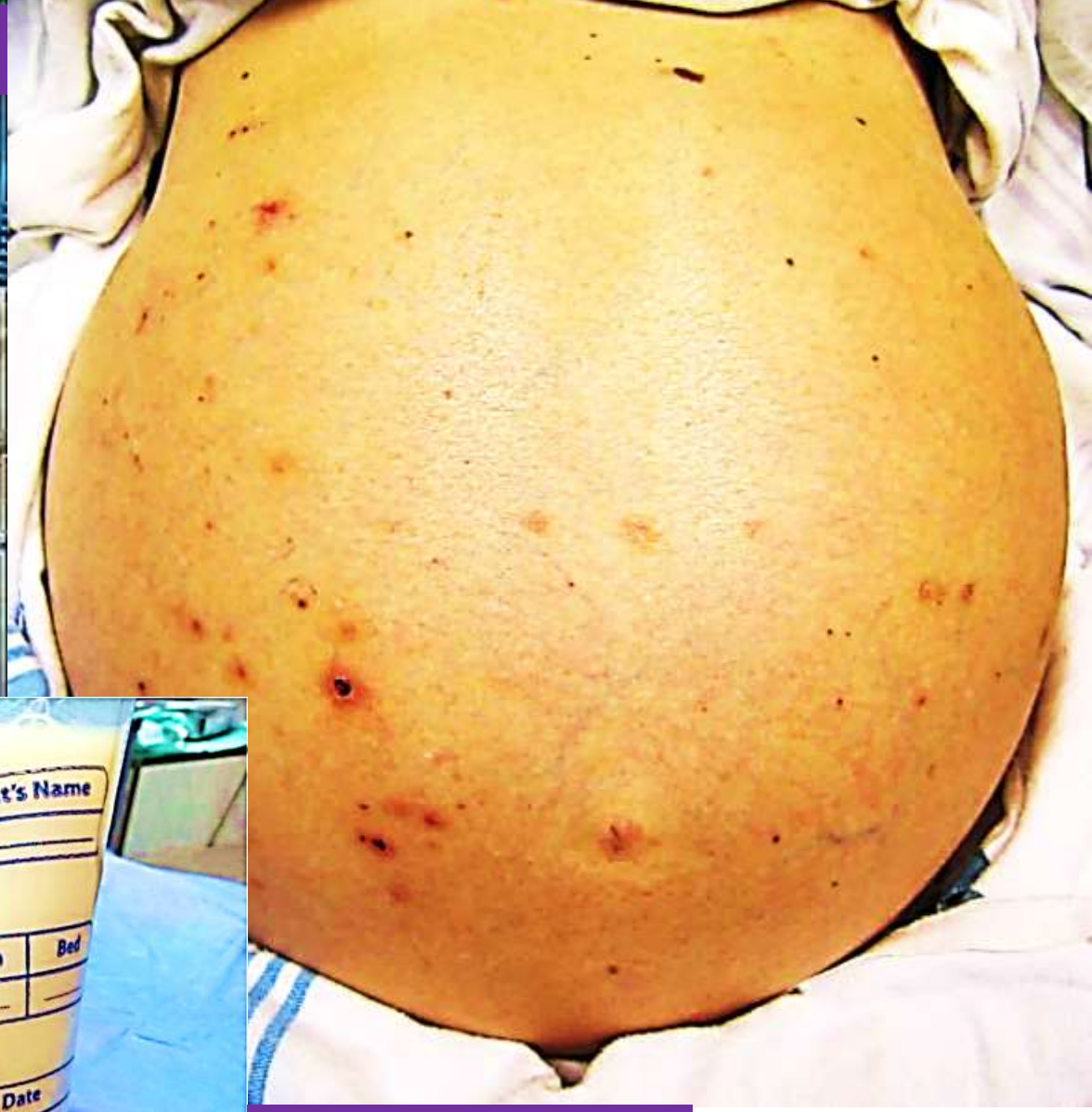
❑ . Eosinophilia is common and a nocturnal peripheral blood smear may show the immature forms, or microfilariae.

Left lower limb filariasis
(elephantiasis)

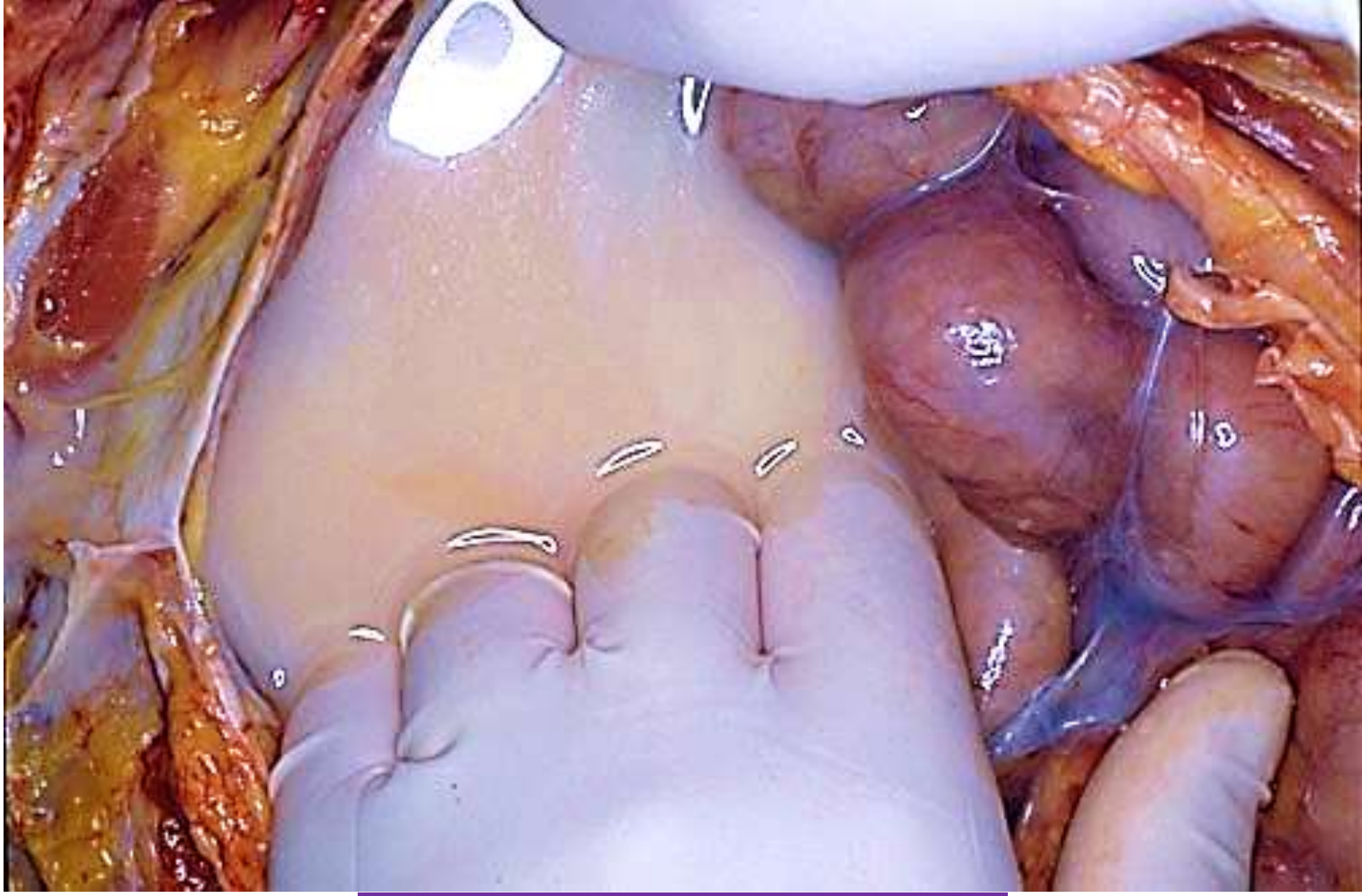
Filariasis of the scrotum (hydrocele) and penis



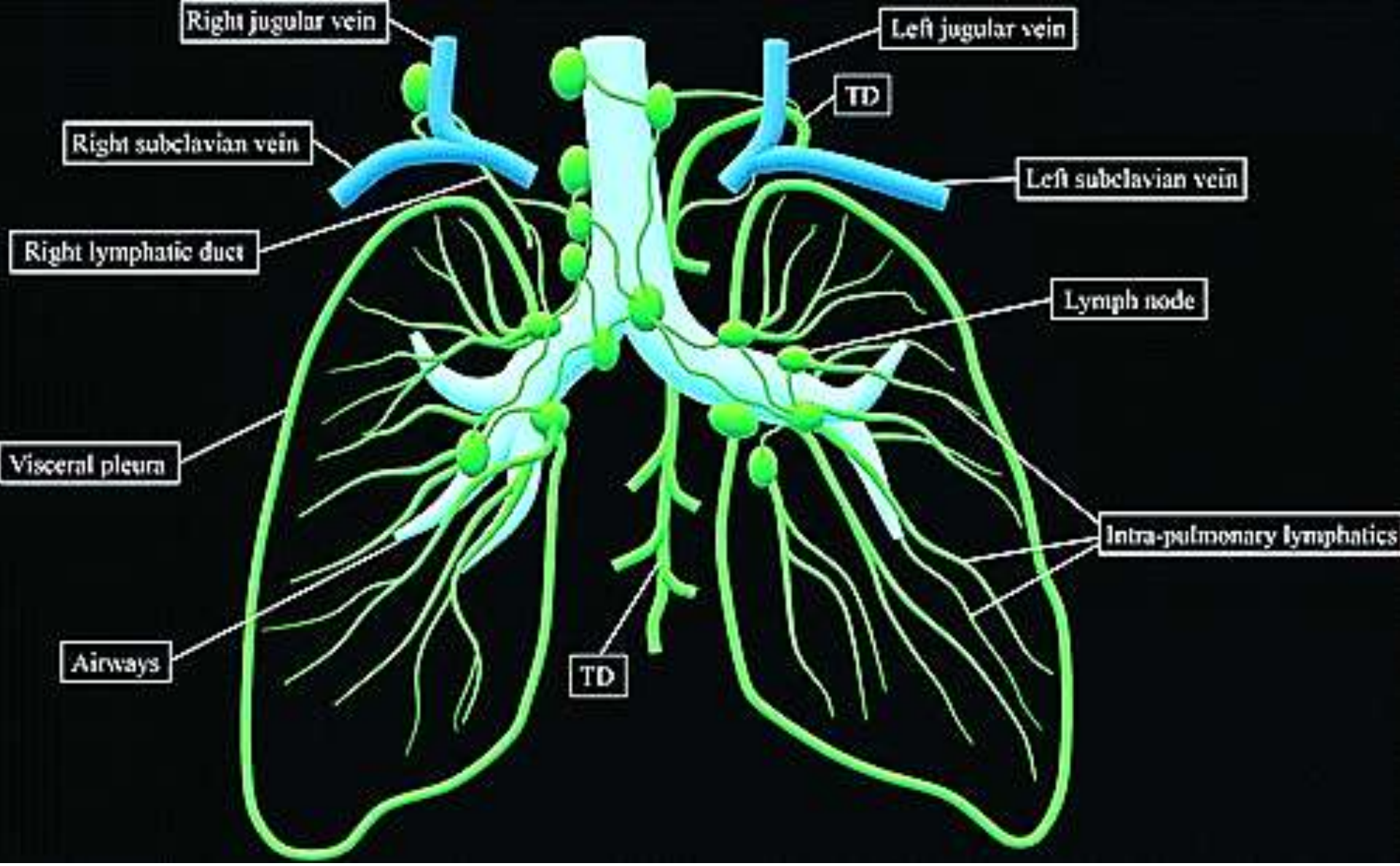
Chyluria



Chylous ascites

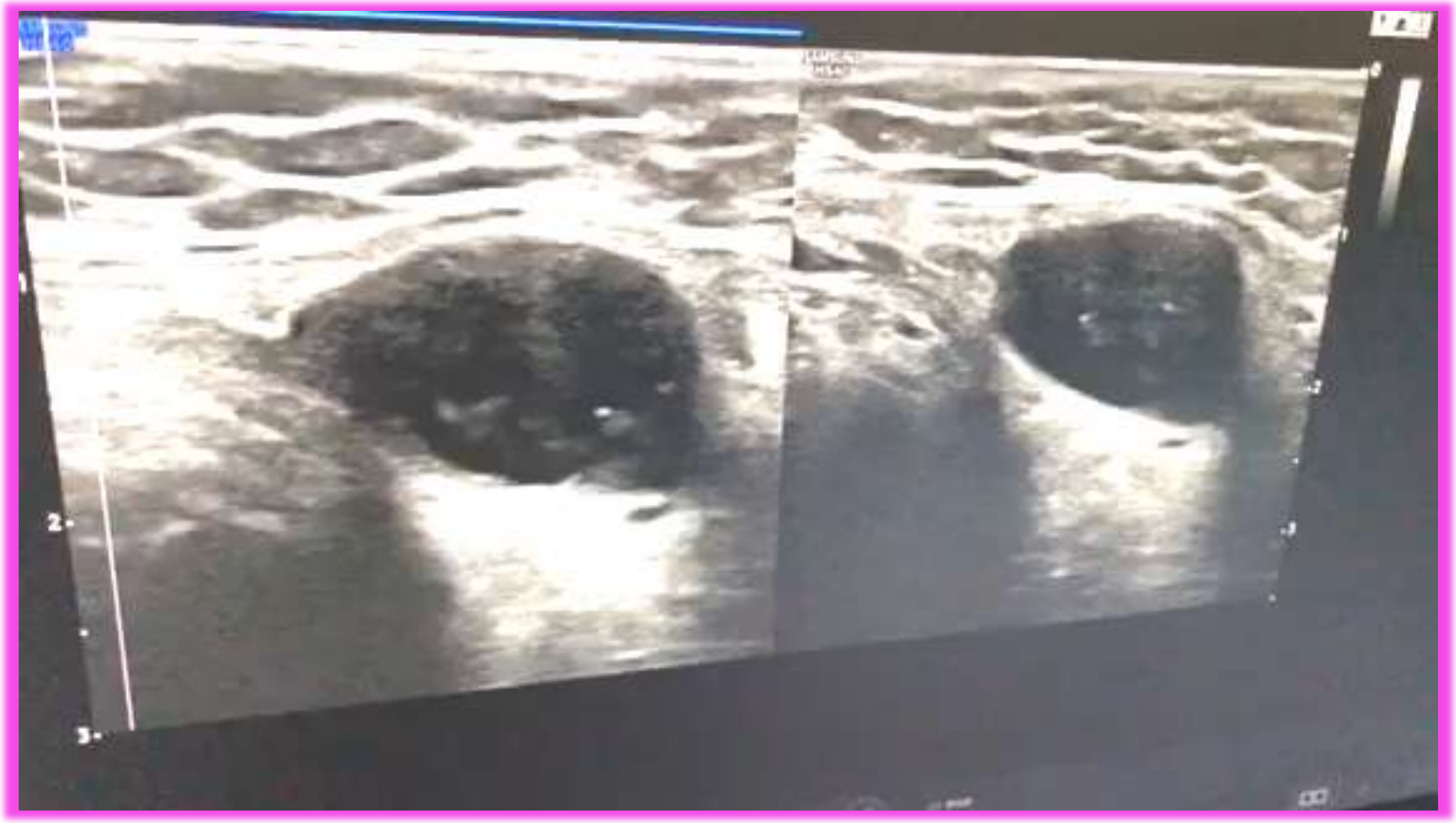


Intraoperative Chylous ascites


Right jugular vein
Left jugular vein
TD
Right subclavian vein
Left subclavian vein
Right lymphatic duct
Lymph node
Visceral pleura
Intra-pulmonary lymphatics
Airways
TD

Chylothorax : Thoracostomy chest tube under water seal.

Thoracoscopy : Chylothorax



A real-time ultrasound scanning of swelling revealed moving internal linear echoes interpreted as a dancing sign

Treatment

- Medical treatment with diethylcarbamazine (anti-filarai parasite) is very effective in the early stages before the gross deformities of elephantiasis have developed.
- In the early stages of limb swelling, intermittent pneumatic compression helps, but the treatment has to be repeated over a prolonged period.
- A hydrocele is treated by the usual operation of excision and eversion of the sac with, if necessary, excision of redundant scrotal skin.
- Operations for reducing the size of the limb are hardly ever done these days because the procedures are so rarely successful.
- Chylous ascites : peritoneal drainage with replacement.
- Chylothorax : Thoracostomy chest tube under water seal.

PRAISE BE TO ALLAH