ASICON 2025 KOLKATA

COMMON MANAGEMENT ALGORITHMS IN SURGICAL PRACTICE

"The illiterate of the 21st century will not be those who cannot read or write, but those who cannot learn, unlearn, and relearn"

Alvin Eugene Toffler
1970

ERAS PROTOCOL

Dr Vikram Kate, Dr Likhita Singh

Enhanced Recovery After Surgery (ERAS) is an evidence-based, multimodal perioperative care pathway designed to reduce surgical stress, optimize physiological function, and accelerate postoperative recovery. Originally developed by Henrik Kehlet in the 1990s, ERAS represents a paradigm shift from traditional surgical care to comprehensive, patient-centered management.

Core Principles

ERAS protocols integrate interventions across three key phases:

1. Preoperative Phase

- Patient Education & Counselling: Comprehensive preoperative information to manage expectations and reduce anxiety
- Nutritional Optimization: Avoidance of prolonged fasting; carbohydrate loading 2-3 hours preoperatively
- No Mechanical Bowel Preparation: Except for specific rectal procedures
- Prehabilitation: Optimization of comorbidities and functional capacity
- Venous Thromboembolism Prophylaxis: Early initiation based on risk assessment

2. Intraoperative Phase

- Minimally Invasive Techniques: Laparoscopic/robotic approaches when feasible
- Short-Acting Anesthetics: Regional blocks and neuraxial anesthesia
- Goal-Directed Fluid Therapy: Maintenance of euvolemia and normovolemia
- Normothermia Maintenance: Active patient warming to prevent hypothermia
- Multimodal Analgesia: Opioid-sparing techniques including NSAIDs, local anesthetics, gabapentinoids
- Avoid Routine Drains & NG Tubes: Unless clinically indicated

3. Postoperative Phase

- Early Mobilization: Out of bed within 4-6 hours, ambulation by POD 1
- Early Oral Nutrition: Clear fluids immediately, solid food within 24 hours
- Multimodal Analgesia: Non-opioid-based pain management
- Antiemetic Prophylaxis: For high-risk patients
- Early Catheter Removal: Within 24 hours in most cases
- Daily Discharge Criteria Assessment: Proactive discharge planning

Benefits of ERAS Implementation

- Reduced Length of Stay: Approximately 30-50% reduction (2-3 days shorter)
- Lower Complication Rates: Up to 40% reduction in postoperative complications
- Faster Functional Recovery: Earlier return to baseline activities
- Reduced Opioid Consumption: Multimodal analgesia reduces opioid requirements
- Improved Patient Satisfaction: Enhanced patient experience and outcomes
- Cost-Effectiveness: Reduced hospital costs without increasing readmissions
- No Increase in Readmissions: Evidence shows maintained or improved readmission rates

Keys to Successful Implementation

1. Multidisciplinary Team Approach: Surgeons, anesthesiologists, nurses, physiotherapists, dietitians
2. Protocol Compliance: Higher compliance rates correlate with better outcomes
3. Institutional Support: Leadership buy-in and resource allocation
4. Audit & Feedback Mechanisms: Continuous quality improvement
5. Patient Engagement: Active patient participation in recovery
6. Bundle Implementation: Multiple components together are more effective than single interventions

Take-Home Messages for Surgical Residents

- ERAS is evidence-based, not just "fast-track" surgery
- Success requires multidisciplinary collaboration
- Multiple interventions bundled together are more effective
- Patient education is a critical component
- ERAS improves outcomes without compromising safety
- Implementation requires institutional commitment and continuous audit.

ADAPTED ENHANCED RECOVERY PROTOCOLS IN EMERGENCY ABDOMINAL SURGERY

PRE-OPERATIVE

- Rapid assessment and resuscitation (ABC stabilization)
- Early nutritional screening if possible
- Patient/family communication about expectations
- Fast-track preoperative investigations and consent
- Non opioid multimodal analgesia.
- NG decompression, IV antibiotics, and PPIs

INTRA-OPERATIVE

- Standardized approach—minimally invasive when feasible but tailored to urgency
- Minimize surgical duration and trauma
- Non opioid multimodal analgesia.(Lumbar epidural if no contraindication.
- Goal directed fluid therapy
- IV dexamethasone 4 mg stat.
- Short-acting opioids and anaesthetic agents.
- Intra-op normothermia

POST-OPERATIVE

- IV antibiotics and IV PPIs (converted to oral on the start of enteral feeds)
- IV metoclopramide on POD 0 & 1
- Non opioid multimodal analgesia.(Lumbar epidural bupivacaine infusion, NSAIDs and acetaminophen)
- Early drain removal (NG tube <300ml/24 h, abdominal drain <100ml/24h, urinary catheter - adequate urine output for 24h)
- Early ambulation (mobilize from POD 0)
- Resumption of orals on resolution of ileus.

NECROTISING FASCITIS

Dr. Utpal De

Suspected necrotizing fasciitis

(evaluation of susceptibility factors, medical history, clinical examination)

Skin and soft tissue findings	Systemic findings	Risk factors
(Incidence)	(Incidence)	
Erythema 59%	Fever 77%	Trauma
Swelling and oedema 48%	Tachycardia 41%	Recent surgery
Discoloration 33%	Pain 34%	Skin breech
Tenderness 25%	Tachypnoea 28%	Immunosuppression/ Malignancy
Induration 14%	Hypotension 30%	Obesity
Bulla 9%		Neuropathy
Ecchymosis 8%		Diabetes
Compartment syndrome 4%		
Crepitus 4%		

Finger test

- **Incision:** A small (around 2cm) incision is made through the skin to the deep fascial layer in the suspected infected area.
- **Probing:** A gloved finger gently probes the tissue at the fascial level.
- **Positive Signs:** The test is positive if all three are present:
  1) Lack of bleeding: Minimal or no blood from the subcutaneous tissue.
  2) Dishwater discharge: A gray, watery, foul-smelling fluid.
  3) Friable tissue: The tissue is easily torn or separated with minimal pressure, indicating necrosis (tissue death).

Send for specimen analysis

Polymicrobial (NF I) / Mono-microbial NF II (16S rDNA sequencing > traditional microbial culture)

Signs of Sepsis/ Diagnostic scores (Scores)

1. Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score - <5 (Mild), 6-7 (moderate), > 8 (Severe)
2. Site other than the lower limb, Immunosuppression, Age, Renal impairment, and Inflammatory markers (SIARI) score
3. Laboratory and Anamnestic Risk Indicator for Necrotizing Fasciitis (LARINF) score

Radiology (presence of gas in the fascial plane is a hallmark of NF)

1. X-ray (limited information, nonspecific, not recommended)
2. Doppler ultrasound (fluid accumulation exceeding 2 mm in depth, diagnostic accuracy 72.7%),
3. CT (first choice for emergency screening),
4. MRI (gold standard sensitivity of 90%–100%, specificity of 50%–85%)

Commandment of Management

1. Thorough debridement (Prompt Incision, debridement, and drainage < 24 hours)
    - Methylene blue can be used to mark necrotic tissues
    - Multiple samples for microbiological analysis
2. Broad spectrum antimicrobial therapy
    - Clindamycin+ meropenem+ vancomycin,
    - Piperacillin/ tazobactam+ vancomycin+ clindamycin,
    - Imipenem/ Cilastatin+ vancomycin, and
    - Ceftriaxone+ clindamycin+ vancomycin
3. Aggressive fluid resuscitation
4. Repeated assessment of the patient's condition
5. Adjuvant therapy –
    - Immunotherapy
    - DVT prophylaxis
    - Respiratory physiotherapy
    - Hyperbaric oxygen therapy (HBOT)
6. Comprehensive nutritional support
7. Rehabilitation and psychological therapy

POST OPERATIVE FEVER

Dr. Saugata Samanta

1. Confirm Fever

- Definition: Temp ≥ 38 °C (100.4 °F) on ≥ 2 occasions, or ≥ 39 °C once.
- 40% of patients develop pyrexia after major surgery - in most cases no cause is found.
- Inflammatory response to surgical trauma may manifest as fever. However in all patients with a pyrexia, a focus of infection should be sought

2. Classify by Timing

Timing after surgery is KEY:

Post-op Day	Likely Cause	Mnemonic
POD 1–2	Wind: Atelectasis, early pneumonia, aspiration	Lung-related
POD 3–5	Water: UTI (catheter)	Urinary tract
POD 5–7	Wound: Surgical site infection (SSI)	Incision
POD 7+	Walking: DVT/PE, thrombophlebitis	Venous
Anytime	Wonder drugs: Drug fever, transfusion reaction, line sepsis	Medications/lines

3. Initial Assessment

- **History:** Surgery type, devices (catheter, lines, drains), medications.
- **Physical exam:** Chest, wound, IV sites, calf tenderness.
- **Review chart:** Anaesthesia record, intra-op events, blood loss, transfusions, temperature chart

4. Investigations (Stepwise)

1. **Basic labs:** CBC, CRP, electrolytes [Test for malaria, dengue or other prevalent causes]
2. **Cultures:** Blood, urine, sputum (before antibiotics).
3. **Imaging:** CXR (if respiratory symptoms or POD 1–2 fever)
   US/CT if abscess suspected (esp. POD >5).
4. **Other:** D-dimer, Doppler if suspect DVT/PE.

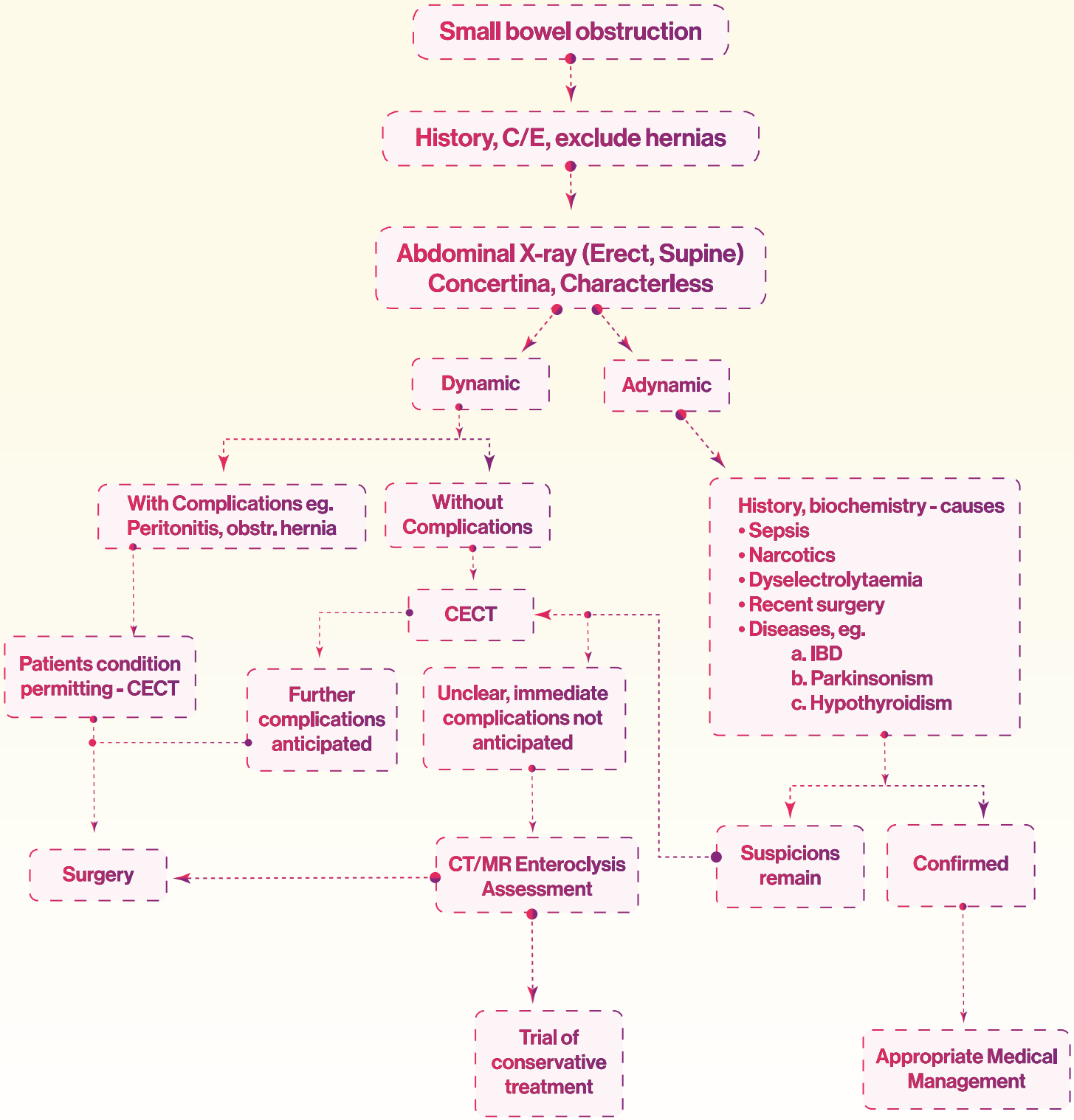
5. Immediate Support

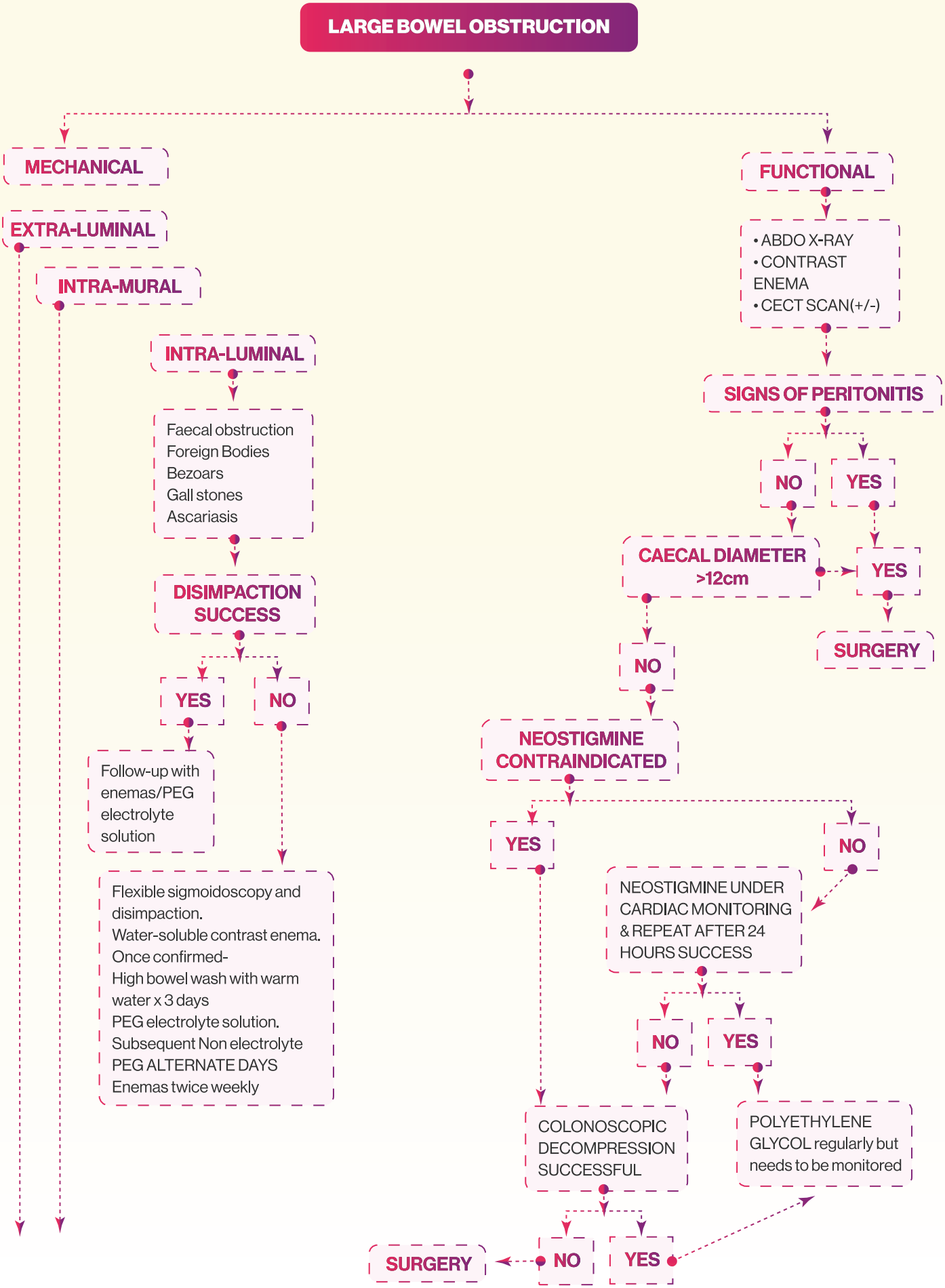
- IV fluids, oxygen if needed.
- Analgesia/antipyretics (Paracetamol) , Physical met
- Remove/replace invasive lines if infection suspected.
- Ensure pulmonary toilet (Incentive spirometry), early ambulation.
- In sepsis with unstable patient /organ dysfunction - consider ICU transfer

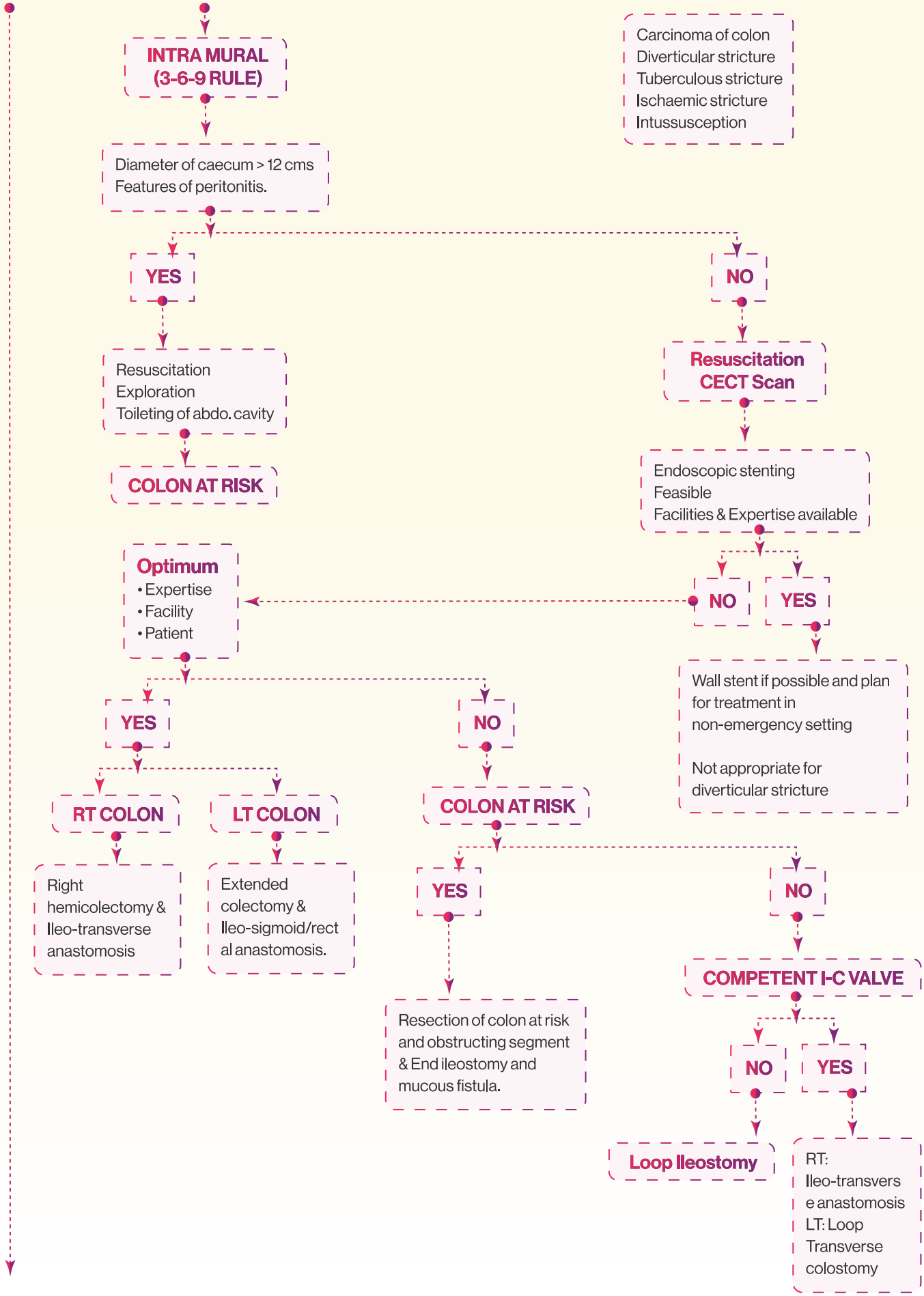
INTESTINAL OBSTRUCTION

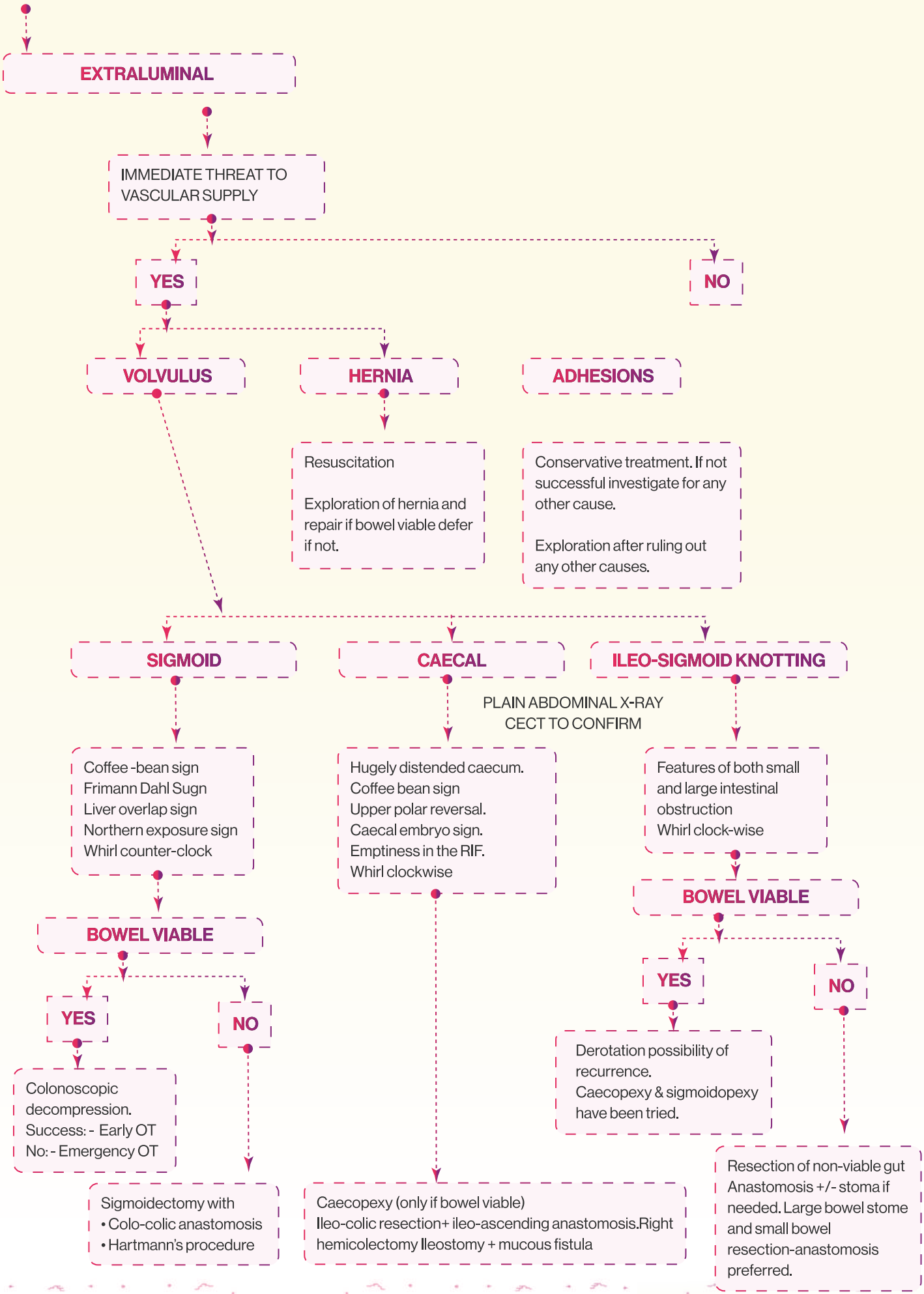
Dr Sanjay De Bakshi

SMALL BOWEL OBSTRUCTION




LARGE BOWEL OBSTRUCTION
MECHANICAL
EXTRA-LUMINAL
INTRA-MURAL
INTRA-LUMINAL
Faecal obstruction
Foreign Bodies
Bezoars
Gall stones
Ascariasis
DISIMPACTION SUCCESS
YES
NO
Follow-up with enemas/PEG electrolyte solution
Flexible sigmoidoscopy and disimpaction.
Water-soluble contrast enema.
Once confirmed-
High bowel wash with warm water x 3 days
PEG electrolyte solution.
Subsequent Non electrolyte PEG ALTERNATE DAYS
Enemas twice weekly
FUNCTIONAL
• ABDO X-RAY
• CONTRAST ENEMA
• CECT SCAN(+/-)
SIGNS OF PERITONITIS
NO
YES
CAECAL DIAMETER >12cm
YES
SURGERY
NO
NEOSTIGMINE CONTRAINDICATED
YES
NO
NEOSTIGMINE UNDER CARDIAC MONITORING & REPEAT AFTER 24 HOURS SUCCESS
NO
YES
COLONOSCOPIC DECOMPRESSION SUCCESSFUL
POLYETHYLENE GLYCOL regularly but needs to be monitored
SURGERY
NO
YES


INTRA MURAL
(3-6-9 RULE)
Diameter of caecum > 12 cms
Features of peritonitis.
YES
Resuscitation
Exploration
Toileting of abdo. cavity
COLON AT RISK
Carcinoma of colon
Diverticular stricture
Tuberculous stricture
Ischaemic stricture
Intussusception
NO
Resuscitation
CECT Scan
Endoscopic stenting
Feasible
Facilities & Expertise available
NO
YES
Wall stent if possible and plan for treatment in non-emergency setting
Not appropriate for diverticular stricture
Optimum
• Expertise
• Facility
• Patient
YES
NO
RT COLON
LT COLON
Right hemicolectomy & Ileo-transverse anastomosis
Extended colectomy & Ileo-sigmoid/rectal anastomosis.
COLON AT RISK
YES
NO
Resection of colon at risk and obstructing segment & End ileostomy and mucous fistula.
COMPETENT I-C VALVE
NO
YES
Loop Ileostomy
RT: Ileo-transverse anastomosis
LT: Loop Transverse colostomy


EXTRALUMINAL
IMMEDIATE THREAT TO VASCULAR SUPPLY
YES
NO
VOLVULUS
HERNIA
ADHESIONS
Resuscitation
Exploration of hernia and repair if bowel viable defer if not.
Conservative treatment. If not successful investigate for any other cause.
Exploration after ruling out any other causes.
SIGMOID
CAECAL
ILEO-SIGMOID KNOTTING
PLAIN ABDOMINAL X-RAY
CECT TO CONFIRM
Coffee -bean sign
Frimann Dahl Sugn
Liver overlap sign
Northern exposure sign
Whirl counter-clock
Hugely distended caecum.
Coffee bean sign
Upper polar reversal.
Caecal embryo sign.
Emptiness in the RIF.
Whirl clockwise
Features of both small and large intestinal obstruction
Whirl clock-wise
BOWEL VIABLE
BOWEL VIABLE
YES
NO
YES
NO
Colonoscopic decompression.
Success: - Early OT
No: - Emergency OT
Derotation possibility of recurrence.
Caecopexy & sigmoidopexy have been tried.
Sigmoidectomy with
• Colo-colic anastomosis
• Hartmann's procedure
Caecopexy (only if bowel viable)
Ileo-colic resection+ ileo-ascending anastomosis.Right hemicolectomy Ileostomy + mucous fistula
Resection of non-viable gut Anastomosis +/- stoma if needed. Large bowel stome and small bowel resection-anastomosis preferred.

ENTEROCUTANOEUS FISTULA

Dr Ramanuj Mukherjee

Diagnosis
- Differentiate between **Enterocutaneous** and **Entero- Atmospheric Fistula**
- Classify wound status **(Deep SSI)**
- Use **Bjork classification** for wound assessment

Assessment
- Assess **hemodynamic parameters.**
- Perform sepsis screening (using **qSOFA** score)
- Initiate **Sepsis-6 Protocol** when indicated

Resuscitation Essesstials
- Fluid and Electrolyte management
- Establishment of long term venous access
- Provide critical care support

Resuscitation End Points
- Hemodynamic parameters stabilized
- Stable Nutrition status, no dyselectrolytemia.
- Adequate Urine Output
- Serum Lactate and Pro-calcitonin improvement
- Prognostic scoring as applicable

Wound Management
- Drain Management
- Fistuloclysis
- Sepsis evaluation for Intra-abdominal Collection (CECT)
- Perform minimally invasive drainage of collections

Why is the Fistula not Healing
- Foreign Body
- Radiation
- Inflammation/ Infection (including IBD)
- Epithelization
- Neoplasm
- Distal Obstruction

Nutrition
- Calorie estimation taking stress factor into consideration.
- Enteral nutrition preferred over parenteral nutrition.
- TPN complication management • Refeeding Syndrome Management

Radiology
- CECT preferred
- Define **Anatomy of "Leak"**
- Define anatomy of healthy bowel.
- **Abdominal wall assessment** in case of difficult closure

Novel Therapy
- Drugs: Octreotide
- Vacuum-assisted wound management
- Fistuloclysis

Restoration
- Resection of diseased segment
- Restore anatomical continuity
- Avoid short bowel syndrome

ACUTE UPPER AND LOWER GI BLEEDING

Dr Dipankar Ray

ACUTE UPPER GI BLEEDING

History, physical examination, estimate mild, moderate, severe bleedin

- Syncope, shock, co-morbidities, ongoing brisk bleeding - Admit in ICU
- Resuscitation - wide bore IV access - crystalloids infusion
- Blood – CBC, Clotting, U & E, LFT, cross match

SUSPECTED VARICEAL BLEEDING

- Octreotide bolus / infusion (or Terlipressin)
- PPI infusion, antibiotics beneficial
- Correct coagulopathy (FFP/ Vit K/ platelets if low)
- Urgent Endoscopy once patient stabilized
- Aim for CVP around 4 -8 cm H2O
- EVL for esophageal varices but gastric variceal bleeding is difficult to control
- Cyanoacrylate glue application / sclerotherapy for gastric varices
- Severe exsanguinating bleeding which cannot be controlled endoscopically – consider SBT (Sengstaken – Blakemore Tube) insertion after endotracheal intubation. Initial control is good but recurrent bleeding after deflation in 50%. Repeat endoscopy for control can be tried, but not more than 2 attempts.
- Consider TIPS or emergency porto-systemic shunt with lower esophageal devascularisation.
- Consider Balloon – occluded retrograde transvenous obliteration (BRTO) for gastric variceal uncontrolled bleeding.

SUSPECTED NON VARICEAL UPPER GI BLEEDING

- Mostly peptic ulcers, consider Mallory-Weiss tear, GAVE, GIST, Dieulafoy lesions
- About 80% cases settle spontaneously
- Glasgow-Blatchford score for management decisions like hospital admission, urgency of endoscopy (e.g. – score > 4 needs urgent endoscopy)
- Rockall score post endoscopy for re-bleed risk and mortality prediction
- Forrest classification of ulcers found in endoscopy predict re-bleeding risk
- Resuscitation , iv PPI
- Main treatment endoscopic – options
    - Mechanical method (e. g. Clips) +/- adrenaline injection
    - Thermal coagulation + adrenaline
    - Fibrin or Thrombin + adrenaline

Consider surgery –

- Failed endoscopic control in high risk stigmata (e,g. Forrest 1a lesion)
- Second re-bleed after endoscopic attempts if age < 60 yrs, consider earlier in patients > 60 yrs old.
- Ongoing bleeding after 6 to 8 units blood/PRBC transfusion
- Operation involves over sewing bleeding vessels, vagotomy+ pyloroplasty or partial gastrectomy depending on case.

ACUTE LOWER GI BLEEDING

- Bleeding from intestine below ligaments of Treitz.
- Haematochezia implies lower GI bleeding usually (rarely brisk upper GI bleeding can cause it)
- Similarly up to 35% patients presenting with melaena can have bleeding distal to ligament of Treitz including right colon.

HISTORY, PHYSICAL EXAMINATION, ESTIMATE MILD, MODERATE, SEVERE BLEEDING

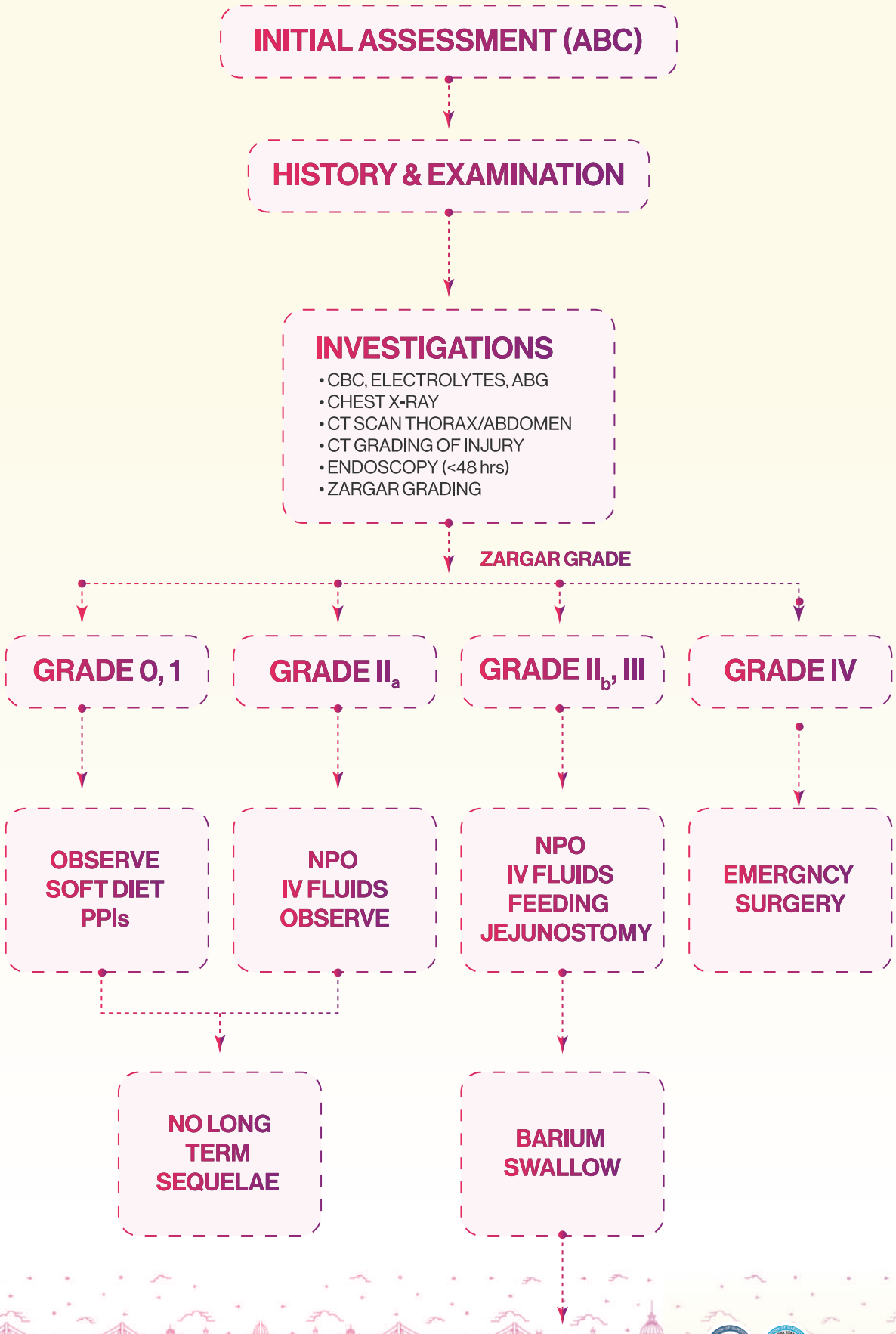
- Syncope, shock, co-morbidities, ongoing brisk bleeding ------- Admit in ICU
- Resuscitation ---- wide bore IV access ---- crystalloids infusion
- Blood – CBC, Clotting, U & E, LFT, cross match
- Overall 90% stops spontaneously, 35% need transfusion, 5% urgent surgery

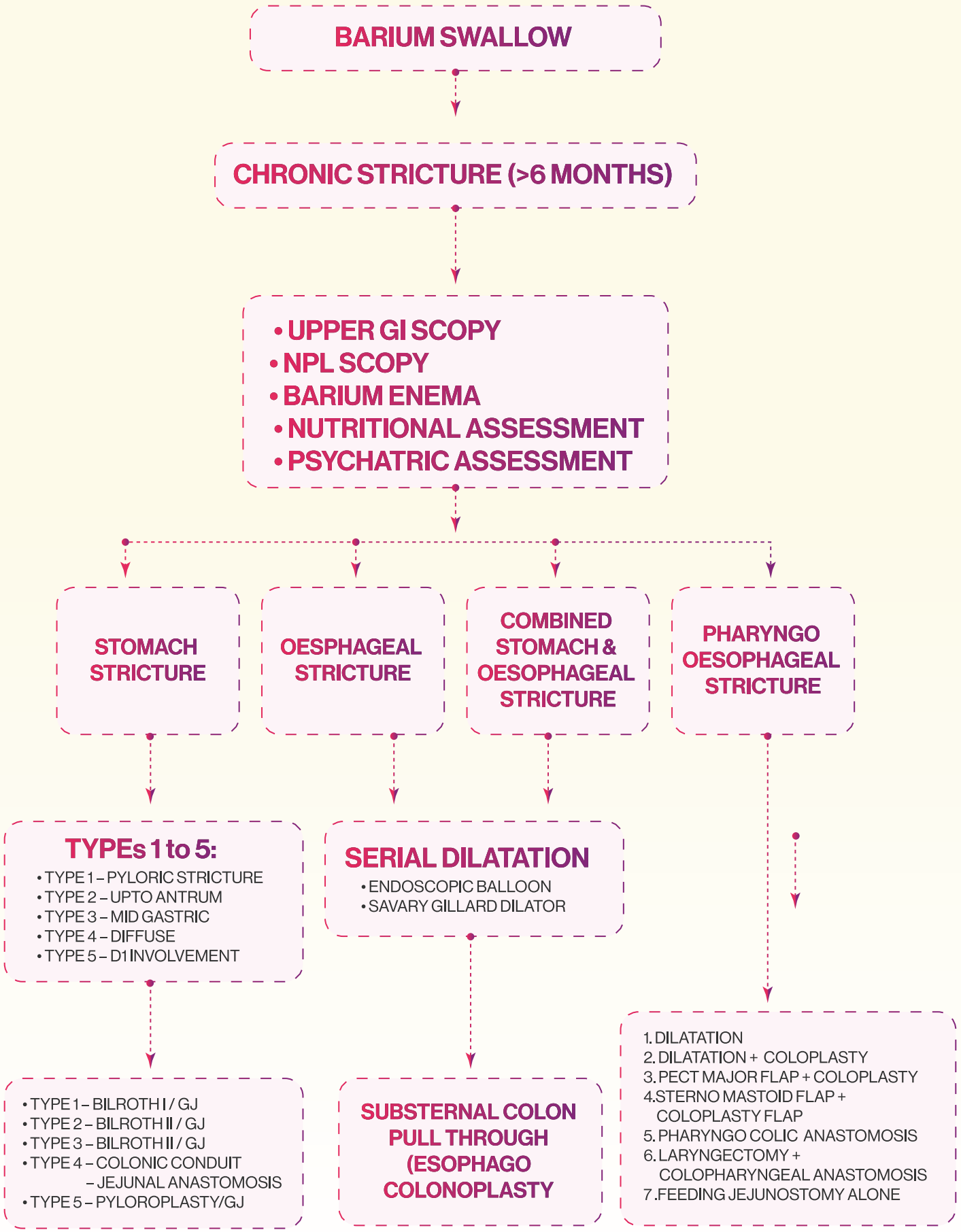
Management

- Severe haematochezia – NG tube and urgent upper GI endoscopy
- Colonoscopy with bowel preparation – investigation of choice – source identified in majority
- May need intestinal lavage with 4 -6 L osmotic laxative through NG tube
- CT angiography or DSA is alternative and often more practical in brisk haemorrhage
- Limited role for pharmacotherapy (tranexamic acid not routinely recommended)
- Endoscopic control in selective cases by clips, adrenaline injection or electro coagulation
- Angiographic coil embolilaztion effective
- Emergency surgery can be tricky if source is not confidently identified pre-operative.
- Keep provision for on table lavage, per-operative colonoscopy.

CORROSIVE INJURIES OF UPPER GI TRACT

Dr. Inian Samaresan




BARIUM SWALLOW
CHRONIC STRICTURE (>6 MONTHS)
• UPPER GI SCOPY
• NPL SCOPY
• BARIUM ENEMA
• NUTRITIONAL ASSESSMENT
• PSYCHATRIC ASSESSMENT
STOMACH STRICTURE
OESPHAGEAL STRICTURE
COMBINED STOMACH & OESOPHAGEAL STRICTURE
PHARYNGO OESOPHAGEAL STRICTURE
TYPEs 1 to 5:
• TYPE 1 – PYLORIC STRICTURE
• TYPE 2 – UPTO ANTRUM
• TYPE 3 – MID GASTRIC
• TYPE 4 – DIFFUSE
• TYPE 5 – D1 INVOLVEMENT
SERIAL DILATATION
• ENDOSCOPIC BALLOON
• SAVARY GILLARD DILATOR
1. DILATATION
2. DILATATION + COLOPLASTY
3. PECT MAJOR FLAP + COLOPLASTY
4.STERNO MASTOID FLAP + COLOPLASTY FLAP
5. PHARYNGO COLIC ANASTOMOSIS
6. LARYNGECTOMY + COLOPHARYNGEAL ANASTOMOSIS
7.FEEDING JEJUNOSTOMY ALONE
• TYPE 1 – BILROTH I / GJ
• TYPE 2 – BILROTH II / GJ
• TYPE 3 – BILROTH II / GJ
• TYPE 4 – COLONIC CONDUIT – JEJUNAL ANASTOMOSIS
• TYPE 5 – PYLOROPLASTY/GJ
SUBSTERNAL COLON PULL THROUGH (ESOPHAGO COLONOPLASTY

BARRETS OESOPHAGUS

Dr. Satyapriya De Sarkar

Barretts mucosa (Result of profuse GERD)

↓

Endoscopic diagnosis and gradation according to Prague classification based on circumferential (C) and maximum extent (M)

↓

Endoscopic biopsy to grade type of dysplasia

No dysplasia	Low-grade dysplasia	High-grade dysplasia	Adenocarcinoma
Surveillance 3 year	Repeat Yearly	3 monthly therapy	Endoscopic Resection or Surgery

Newer endoscopic technologies helping assess dysplasia

- Narrow Band Imaging(NBI)
- Flexible Spectral Imaging Colour Enhancement (FICE)
- I-Scan

Treatment modalities

- **Endoscopic**
  - **Ablation**
    - i. Argon plasma Coagulation
    - ii. Multipolar electrocoagulation
    - iii. Cryotherapy
    - iv. Photodynamic therapy
    - V. Radiofrequency Ablation

    → **Histopathology cannot be assessed**
  - **Resection**
    - i. Endoscopic mucosal resection
    - ii. Complete circumferential endoscopic resection
    - iii. Endoscopic submucosal dissection

    (Histopathological confirmation is precise)
- **Surgical**

Population-based study of patients with early esophageal adenocarcinoma → Endoscopic therapy is equally effective with surgical resection in longterm survival.

CARCINOMA OESOPHAGUS

Dr Inian Samaresan

Endoscopic biopsy
+
MSI / HER2 / PDL-1

STAGING:

1. CECT/PET CT
2. STAGING LAPAROSCOPY (Adeno ca – GEJ)
3. BRONCHOSCOPY/WASHINGS (SCC-Upper/Mid Thoracic)
4. ENDOSCOPIC USG (Early Cancer)

MULTI DISCIPLINARY TUMOUR BOARD DISCUSSION

MEDICALLY FIT

MEDICALLY UNFIT

CERVICAL LOCATION (SCC)

THORACIC / GEJ TUMOURS (SCC / ADENO)

PALLIATION / BEST SUPPORTIVE CARE

DEFINITIVE CRT

T_{is}

T_{1a}

T_{1b-4a}

T_{4b}

Any T, N M_1

ENDOSCOPIC RESECTION +/- ABLATION

ENDOSCOPIC RESECTION (or) ESOPHAGECTOMY

GOOD PERFORMANCE STATUS

POOR PERFORMANCE STATUS

UPFRONT SURGERY

$T_{1b}, T_2 N_0$

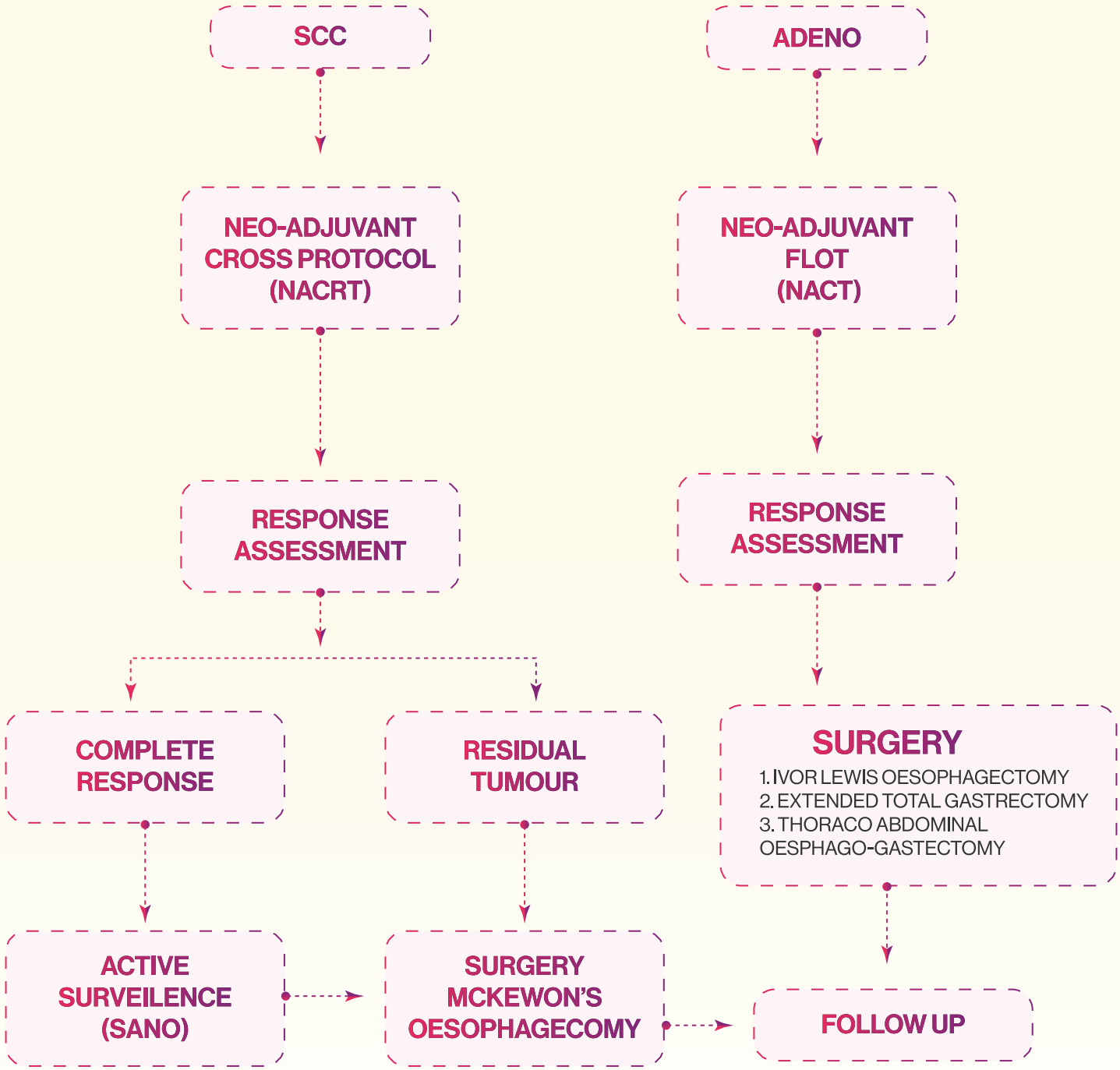
$>T_2$ or N_+

SYSTEMIC / INMMUNO THERAPY

BEST SUPPORTIVE CARE

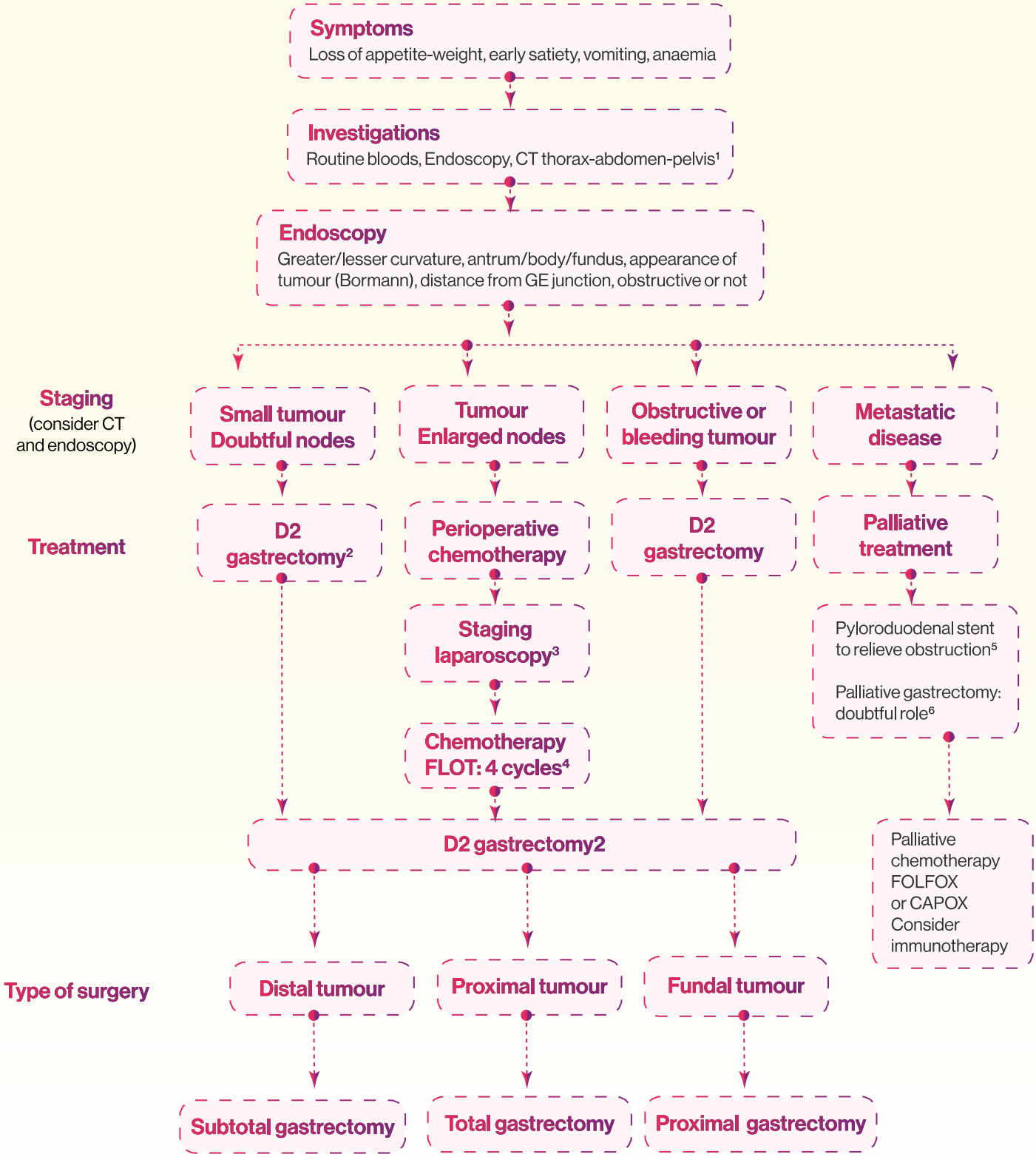
SCC

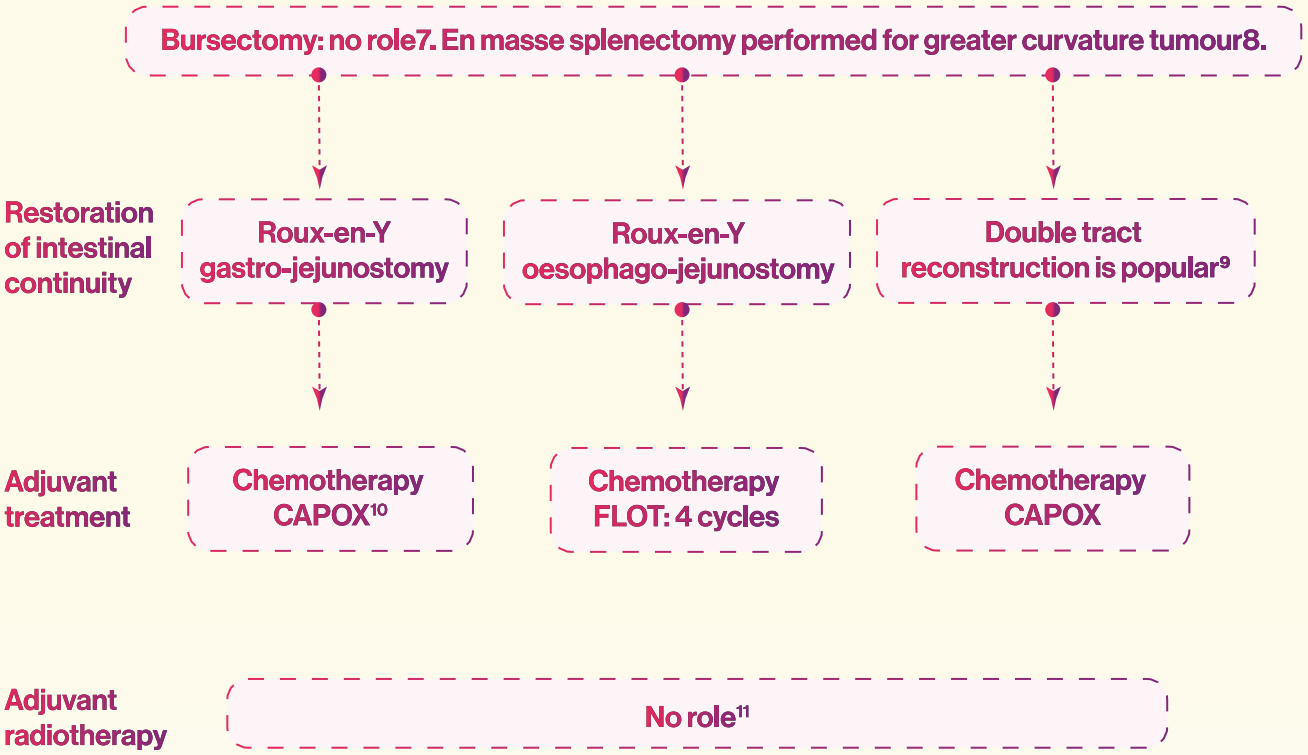
ADENO


SCC
ADENO
NEO-ADJUVANT CROSS PROTOCOL (NACRT)
NEO-ADJUVANT FLOT (NACT)
RESPONSE ASSESSMENT
RESPONSE ASSESSMENT
COMPLETE RESPONSE
RESIDUAL TUMOUR
SURGERY
1. IVOR LEWIS OESOPHAGECTOMY
2. EXTENDED TOTAL GASTRECTOMY
3. THORACO ABDOMINAL OESPHAGO-GASTECTOMY
ACTIVE SURVEILENCE (SANO)
SURGERY MCKEWON'S OESOPHAGECOMY
FOLLOW UP

GASTRIC ADENOCARCINOMA

Dr. Manas Roy





Early gastric cancer, not so common in our country, have been excluded for the sake of clarity.

REFERENCES: (1) NICE guidelines 2018, (2) Lancet Oncology 2010;11(5): 439-49, (3) AJCC 7th ed. (4) J. Clin. Oncol. 2017;35(Suppl. 15):4004 (5) World J Surg. 2023 Jun;47(6):1519-1529 (6) Lancet Oncol. 2016 Mar;17(3):309-318 (7) Lancet Gastroenterol Hepatol 2018 July:3(7): 460-468. (8) Ann Surg 2017 Feb: 265(2): 277-83 (9) Ann Med Surg (Lond). 2022 May 31:79:103879 (10) Lancet 2012; 379: 315–21 (11) Ann Oncol. 2021 Mar;32(3):368-374

ACUTE APPENDICITIS

Dr Niloy Mandal

Classic clinical presentation

Symptoms

- Periumbilical pain, gradually shifting to right iliac fossa,
- Anorexia
- Diarrhea or constipation

Physical examination

- Fever
- Tachycardia
- Ill looking
- Tenderness in McBurney point
- Rigidity or rebound tenderness- suggestive of appendicular perforation
- Rovsing sign, obturator sign, psoas sign- indicates localized peritonitis, but not diagnostic of acute appendicitis.

Atypical presentation

- Retrocecal appendix may present with flank or back pain or right subcostal area.
- Suprapubic pain(due to inflamed appendiceal tip in pelvis)

DIAGNOSIS(based on symptoms and signs, clinical scoring systems and imaging)

Besides symptoms and signs, several scoring systems are developed, but few are recommended in recent consensus guidelines for regular clinical use- (i)Appendicitis inflammatory response(AIR) score; (ii)Adult appendicitis score(AAS); (iii)Alvarado score. How clinical scoring helps?- (a)By excluding acute appendicitis; (b)Guides which patient needs imaging or surgery; (c)Which patient can be discharged.

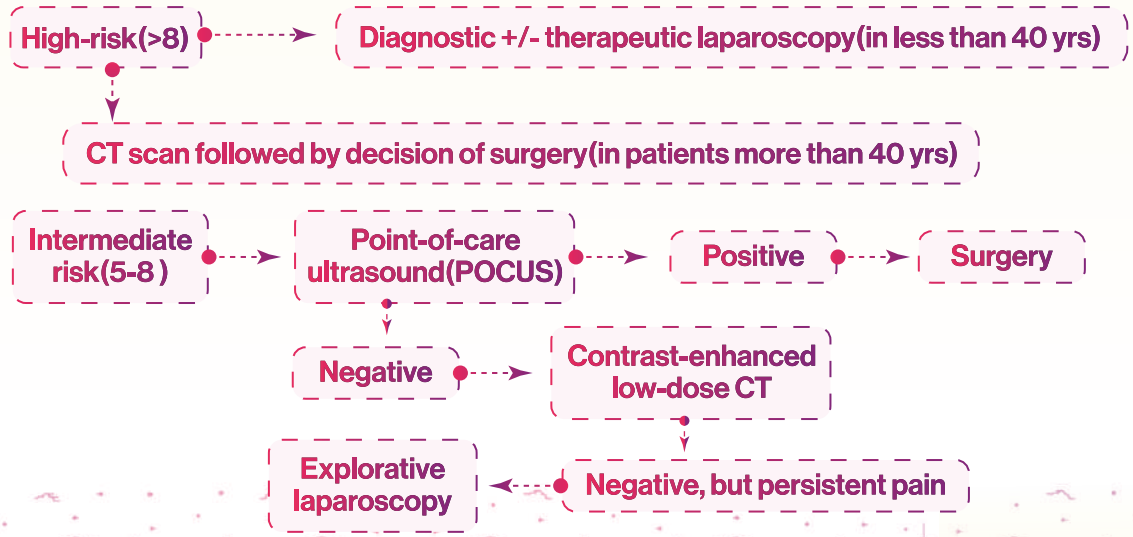
In adult patients-

Alvarado score < 5 → Acute appendicitis is excluded

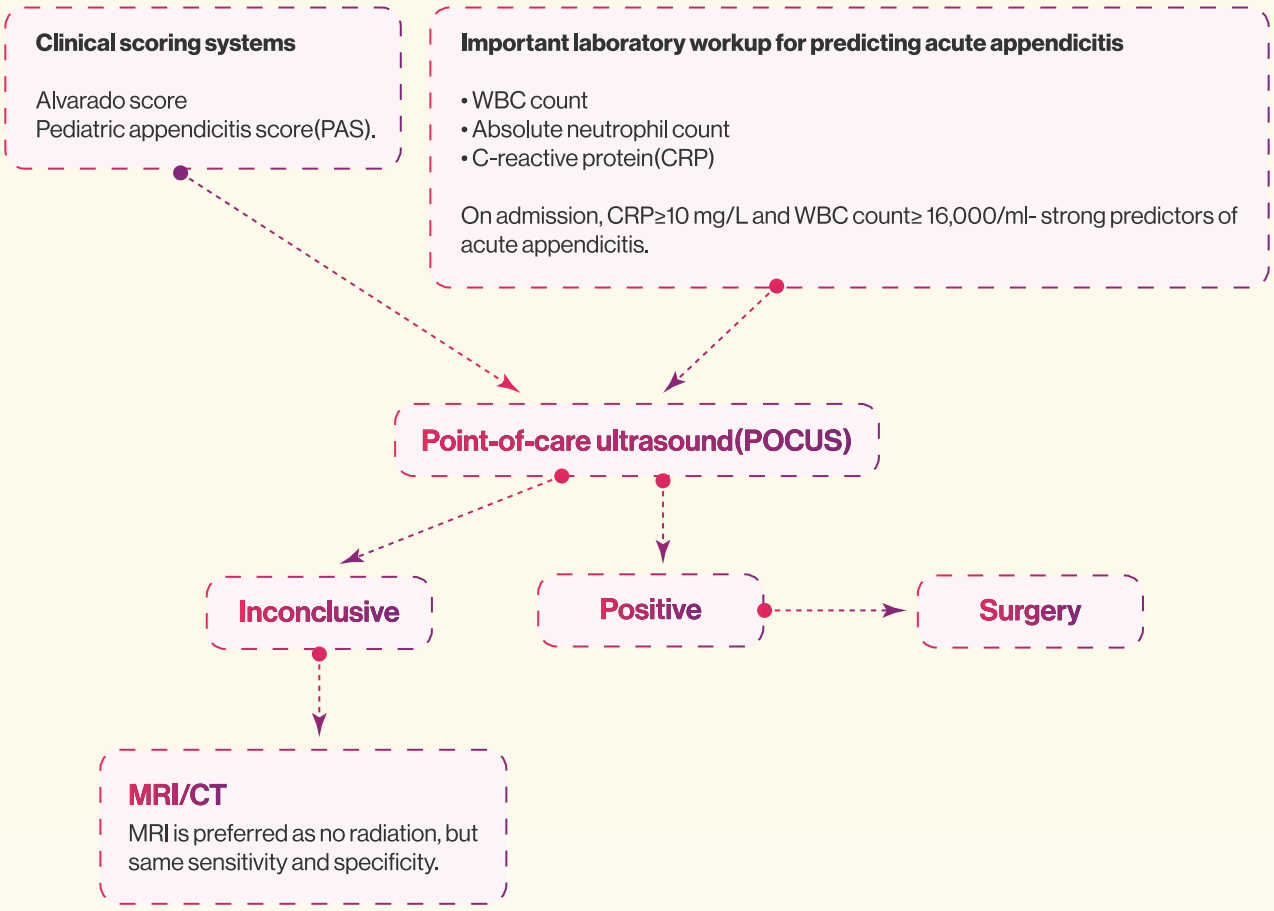
Don's use this score for positive confirmation.

AIR score-

Low-risk(<5)- Patient may discharged;

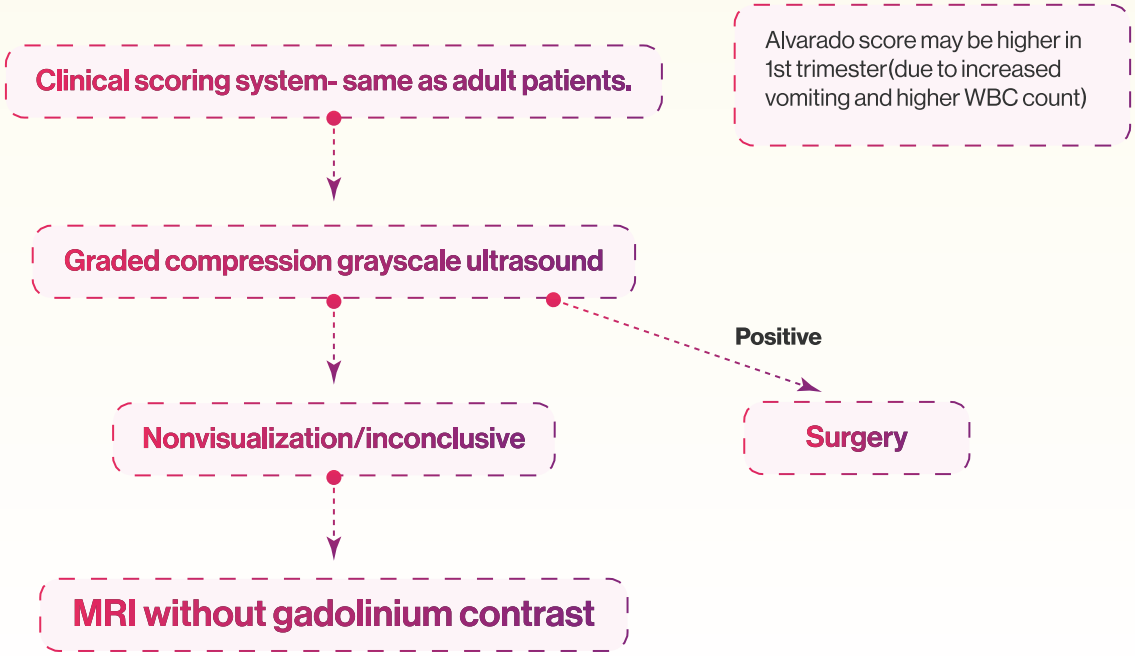


In pediatric patients



In pregnant women

Clinical presentations not always like adult patient(nausea and vomiting may be related to pregnancy, cephalad displacement of appendix due to gravid uterus)



In elderly patients

(1)Classic symptoms and signs of acute appendicitis is not always present

So, high index of suspicion is important for early diagnosis and management

(2)Wide range of differential diagnosis must be kept in mind- acute diverticulitis, complicated UTI, intestinal ischemia, ischemic colitis

Early CT abdomen

- Routine CT often reduce the delay in diagnosis
- Can differentiate complicated from uncomplicated appendicitis

Early diagnosis and treatment is very important because of higher risk of appendicular perforation and higher morbidity due to presence of comorbidities.

Role of imaging

In adult patients

Positive US findings (enlarged, immobile, noncompressible) → **Appendectomy**

Nonvisualization or inconclusive US findings → Acute appendicitis cannot be ruled out → **Contrast enhanced low-dose CT abdomen**

CT findings
diameter more than 7 mm, thickened and inflamed wall, mural enhancement → **Appendectomy**

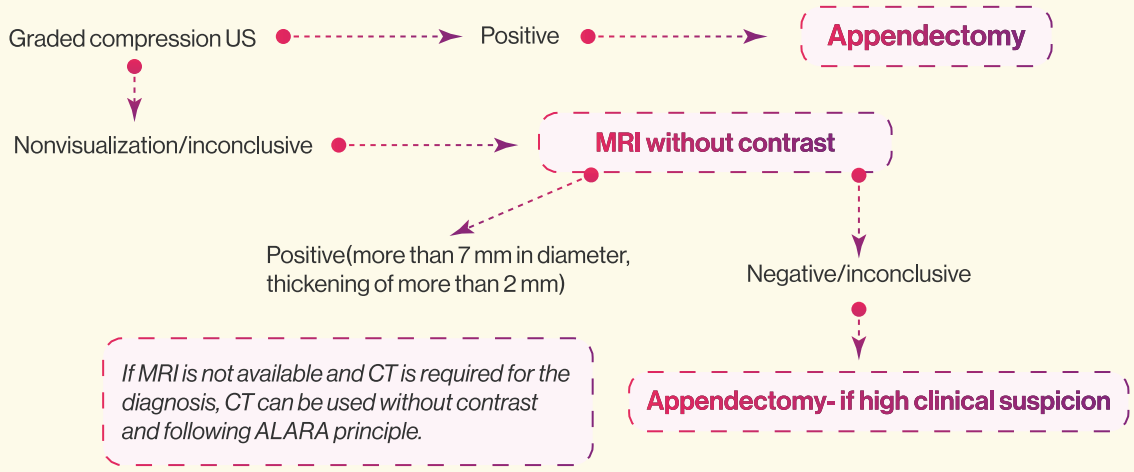
In pediatric patients

Point-of-care ultrasound (POCUS) → Positive → **Appendectomy**

Inconclusive →
Repeat US
MRI
CT

If MRI is available, it is preferred in children because
No radiation
Can differentiate perforated from non-perforated appendicitis.

In pregnant women



MANAGEMENT

Any role of non-operative management?

-The answer is yes, but **first exclude-** (i)Complicated appendicitis(e.g. gangrenous AA, appendicular abscess, diffuse peritonitis) by imaging; (ii)Presence of appendicolith.

Second, counsel the patient about failure of NOM/recurrence.

Your decision of NOM with antibiotic therapy is likely to be successful if- (a)Lower temperature; (b)Smaller diameter of appendix.

Duration of antibiotic therapy- IV antibiotic for at least 48 hrs then oral antibiotic(total 7-10 days).

Recommended IV antibiotic regime- (a)Ceftriaxone 2g 24 hrly + metronidazole 500 mg 6 hrly; (b)Cefotaxime 2g 8 hrly + metronidazole 500 mg 6 hrly; (c)Ciprofloxacin 400 mg 8 hrly + metronidazole 500 mg 6 hrly. Any of the regimes according to availability or patient compliance.

Surgical management-

Indications- (a)Complicated appendicitis; (b)Patient wants surgery though a candidate for NOM.

Approach- Laparoscopic/open. Laparoscopic appendectomy is recommended for both uncomplicated and complicated appendicitis if expertise and equipments are available. Laparoscopic approach is safe and feasible during pregnancy.

Decision of some crucial Intraoperative steps- (a)During laparoscopic appendectomy in complicated appendicitis, suction aspiration of gross purulence is effective, no extra advantage of peritoneal irrigation; (b)No difference in clinical outcome for different techniques of mesoappendix dissection(e.g. monopolar electrocoagulation, bipolar device, vessel sealer, ultrasound energy devices); (c)For stump closure, endoloop/suture ligation or polymeric clip is recommended. In complicated cases, endostapler may be considered based on surgeon's choice and availability; (c)Stump inversion is not recommended; (d)Intraperitoneal drain is not recommended after appendectomy for complicated appendicitis(no benefit in prevention of development of intra-abdominal abscess).

In uncomplicated appendicitis, preoperative single dose of antibiotic is recommended, postoperative antibiotics are not recommended. It is recommended for complicated AA.

Acute appendicitis with abscess/phlegmon

Diagnosis- CT abdomen with IV contrast.

Treatment of appendicular abscess

IV antibiotics + percutaneous image-guided drainage

↓

If technically not feasible

↓

Laparoscopic/transrectal/transvaginal drainage of abscess

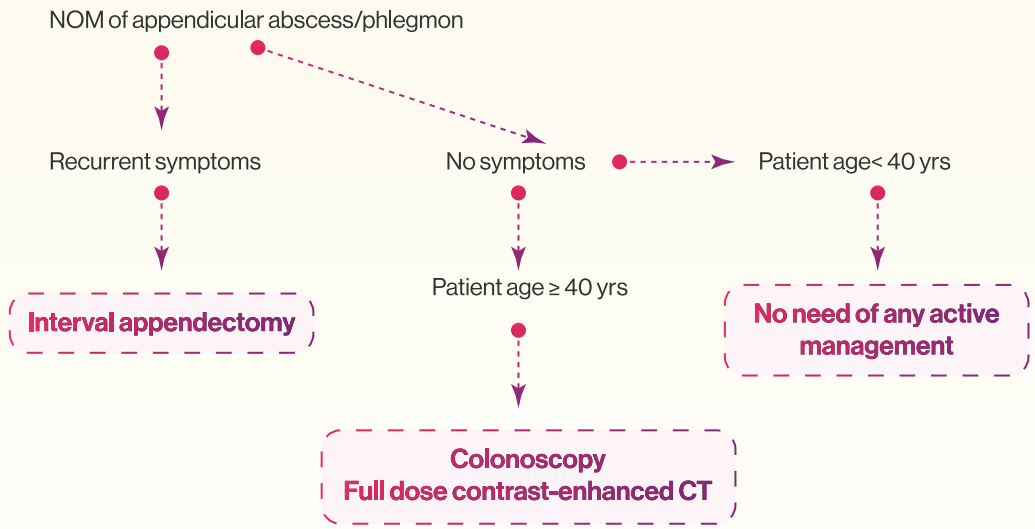
Laparoscopic operative approach may only be considered if advanced laparoscopic expertise is available.

Treatment of periappendiceal phlegmon

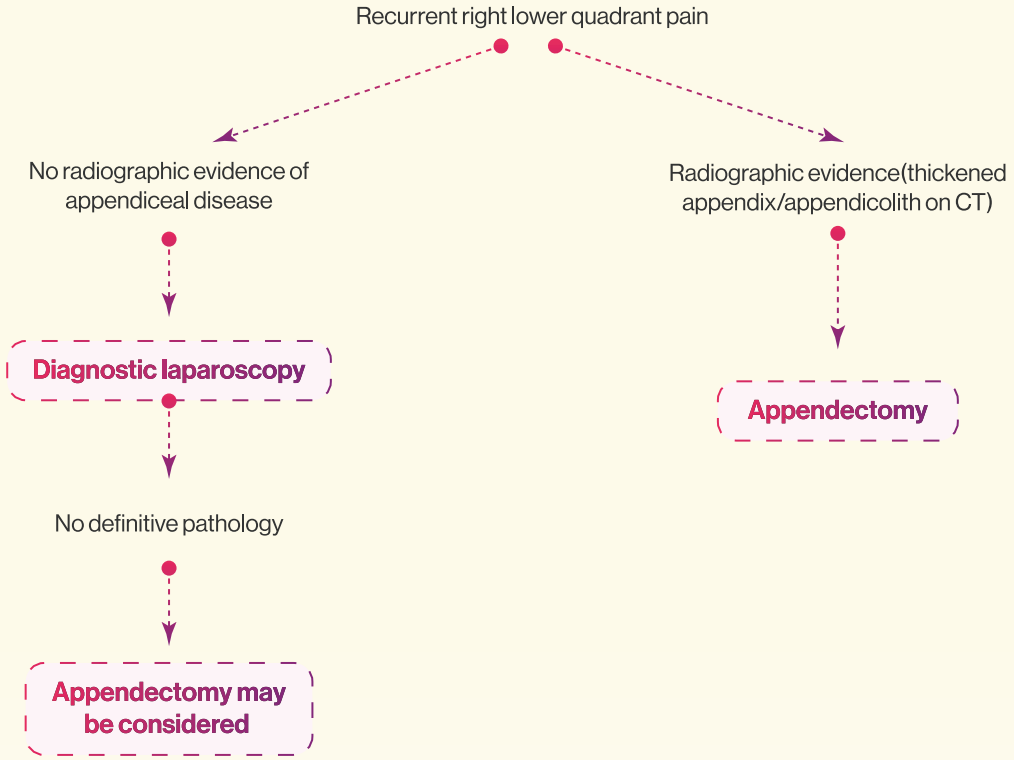
IV antibiotic therapy for 4-7 days

- Responding to treatment
- Not responding to treatment → Imaging to rule out appendicular abscess

Is routine interval appendectomy is indicated after conservative management of appendicular abscess or phlegmon?



Chronic appendicitis



APPENDICULAR NEOPLASM

Dr Avishek Ganguly

1. Mucinous Neoplasms

• Subtypes: LAMN | HAMN | Mucinous Carcinoma Peritonei

Localized disease:

Previous appendectomy done → Check margin:
- Margin negative → Surveillance
- Margin positive → Caecal cuff resection / Ileocecal resection

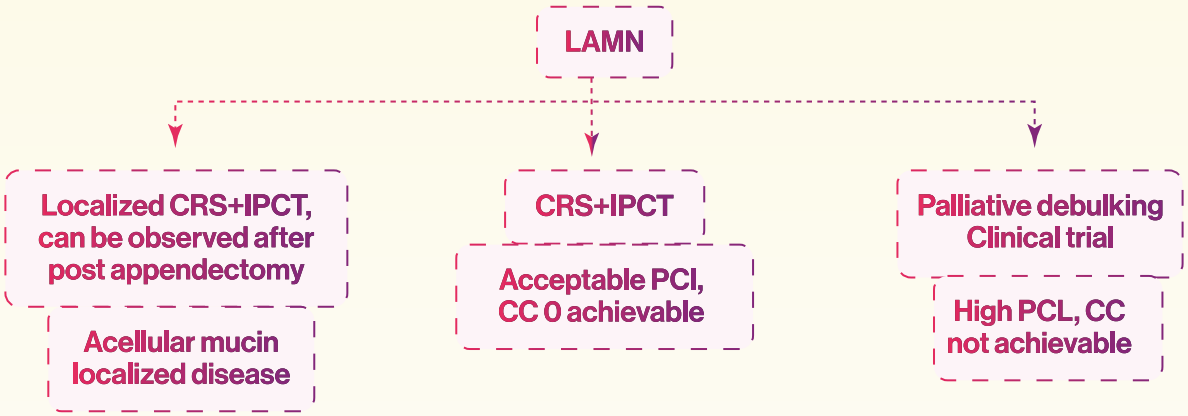
Radiological diagnosis → Diagnostic laparoscopy + appendectomy

Peritoneum-only disease:

- **High-grade carcinoma peritonei/ GCA**

Do Biomarker, consider NACT - If good response → CRS + IPCT
When only WDAC, low PCI → Consider upfront CRS + IPCT

- **Low-grade appendiceal mucinous neoplasm (LAMN)**



2. Appendiceal Adenocarcinoma / Undifferentiated / NOS

- Localized → Right hemicolectomy + Adjuvant FOLFOX / CAPEOX
- Metastatic → Palliative chemotherapy

3. Neuroendocrine Tumor (NET)

- Tumor <1 cm (no invasion) → Simple appendectomy
- Tumor 1–2 cm:
  - No serosal invasion → Simple appendectomy
  - Serosal invasion / mesoappendiceal invasion → Right hemicolectomy
- Tumor >2 cm → Right hemicolectomy

Check for lymph node involvement and grade (G1–G3) – Adjuvant chemo based on these factors

COLON CANCER

Dr Arnab Chakraborty

Diagnostic workup:

1. Clinical examination (MANDATORY Per rectal examination)
2. Diagnosis: Full-length colonoscopy and biopsy (Full length preferable to rule out synchronous lesion in 3-8 % cases)
3. Staging: Contrast CT abdomen/pelvis/thorax
4. WBPET not advisable for staging in routine cases
5. Serum CEA for prognostication only.

T1 OR SMALLER TUMOR ALGORITHM

Colonoscopy revealed polyp suggestive of submucosal invasion (malignant polyp)

Completely resectable endoscopically?

Endoscopic removal:
Conventional snare polypectomy, EMR, ESD or other advanced polypectomy technique

Failed endiscopic removal

Biopsy

Pathologic evaluation

Low Risk:
1. Sm 1-2 or Haggitt 1-3
2. Well/intermediate differentiation
3. No lymphovascular invasion
4. ≥1 mm resection margin

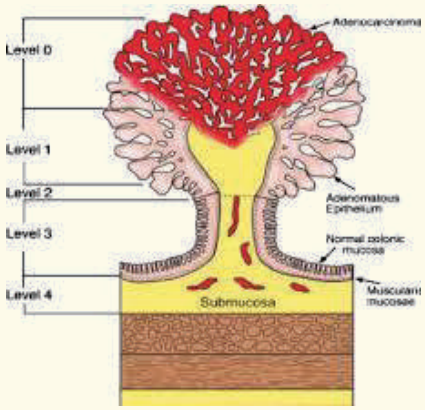
High Risk:
1. Sm 3 of Haggitt 4
2. Poor differentaion
3. Lymphovascular invasion
4. <1 mm resection margin
5. Piecemeal resection
6. Tumor budding

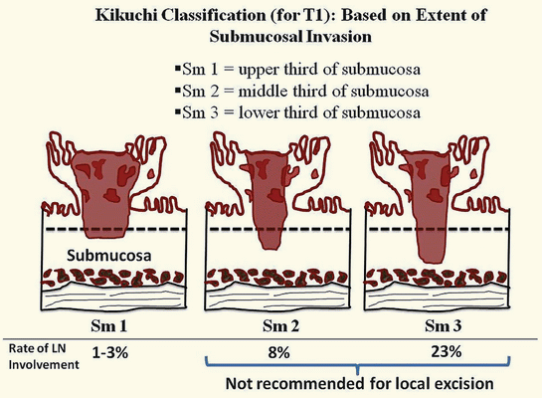
Surgical resection with lymph node clearance (if medically fit)

Surveillance

POLYPS can be

1. Pedunculated (Classified as Haggits classification)
2. Sessile (Classified by Kikuchi classification)





Any adenocarcinoma involvement of submucosa layer mandates Colectomy with lymph node dissection (Minimum 12 nodes)

BIOPSY:

Colonoscopic biopsy preferred and sent for MSI/MMR testing preferably at first biopsy

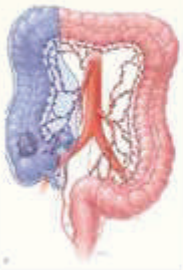
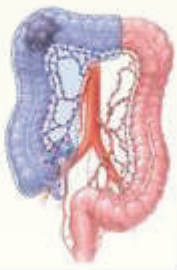
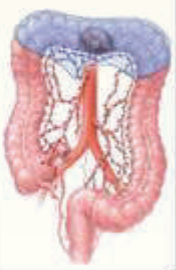
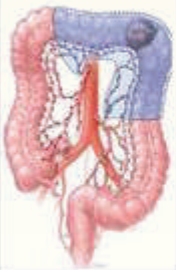
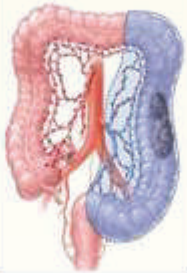
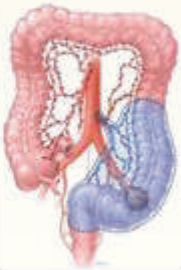
BEFORE STARTING TREATMENT:

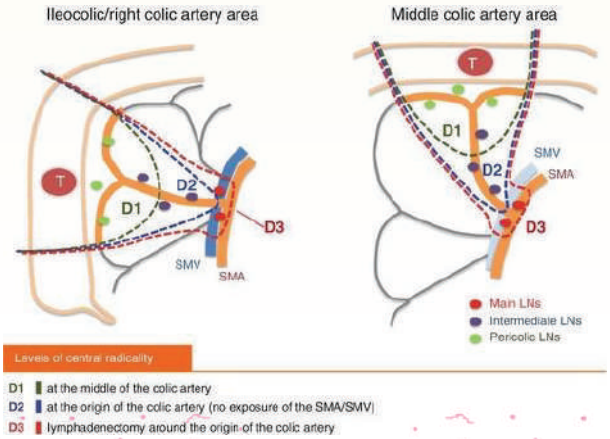
All Colon Cancer patients should undergo
1. Family h/o FAP/HNPCC/Afap
2. Fertility risk discussion

>T1N0 tumours are subjected to Radical colectomy with lymph node dissection

Surgical principles
1. Wide excision of tumour with at least 5 cm segment of colon on both side (Can be more depending on the blood supply)
2. Enblock Colon & Mesocolon resection with LN
3. Minimum 12 LN harvest
4. During procedure, ALWAYS inspect peritoneum and Ovaries in female
5. Enblock resection of adjacent involved organs in T4b disease if feasible
6. Obstructive colon cancers may be operated in one or two stage (Hartmann/Stoma)
7. Colonic stenting in high risk patients (age >70,ASA III/IV)

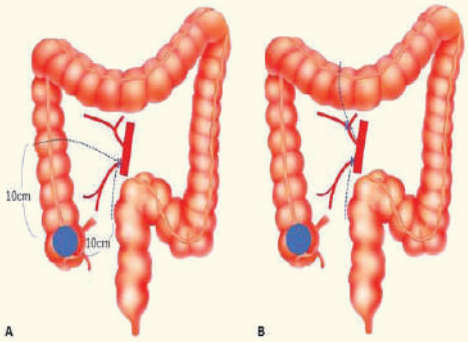
TYPES OF SURGERY & VESSELS INVOLVED ACCORDING TO LOCATION

Right	Hepatic flexure	Transverse	Splenic flexure	Left	Sigmoid
					
Ileocolic, right colic *(if present)*	Ileocolic, right colic *(if present)*, middle colic	Middle colic	Middle colic, ascending left colic	Inferior mesenteric + ascending left colic	Inferior mesenteric



BASED ON SINGLE VESSEL

D1: EPICOLIC NODE DISSECTION
D2: D1+INTERMEDIATE NODE
D3: D2 +PRINCIPLE NODE



D3 vs CME

A. D3 COLECTOMY: Smaller area of bowel resected, 10 cm margin
B. CME: Larger area of bowel & mesocolon resected, higher LN dissection

MSI TESTING MANDATORY IN ALL BIOPSY SAMPLES

1. MSH2, MSH6 LOSS: indicates **LYNCH SYNDROME**
2. MLH1, PMS2 LOSS: indicates **BRAF MUTATION** (ANTI BRAF AGENTS CAN BE USED)

Adjuvant Colon Cancer

- **Stage I**
- **Stage II**
  - **Low Risk**
    - No risk factors
  - **Intermediate**
    - LVI
    - PNI
    - Grade 3
    - Obstruction
    - CEA> 5
  - **High Risk**
    - T4
    - >12 LN
    - Multiple risk factors from intermediate
- **Stage III**

MSI

MSS

- Adjuvant Capecitabine 6 months
- Adjuvant FOLFOX 6 month
- Adjuvant CAPOX 6 month

FOLLOW UP

Clinical examination & CEA 3 monthly till 2 years, then 6 monthly till 5 yr, then yearly
Colonoscopy every 3 yearly (First colonoscopy at 6 months if not done previously)
Contrast CT every year

RECTAL PROLAPSE

Dr. Udipta Ray

Types:
1 Partial (1-4cm , mucosa+submucosa)
2 Complete (>4cm, full thickness)

Management of Partial Prolapse:

Infants + Young children

↓

Digital reposition (Taping of buttocks in infants)

↓ If fails

- Thiersch procedure (anal cerclage)
- Submucosal sclerosant injection

Adults

- **Localised small area**
  - Submucosal sclerosing Injection
  - Partial excision
- **Circumferential prolapse**
  - Stapled Haemorrhoidopexy

+ Treatment of cause

- Malnutrition
- Chronic Constipation/diarrhoea
- GI infections, Spina bifida, Cystic fibrosis

- Sphincter atony
- Complete perineal tear

Management of Complete Prolapse:

Acute presentation (incarcerated) in children (rare)

↓

Manual Reduction
+ Treatment of cause (like malnutrition)
+ Evaluation of cause and treatment

↓

Surgical correction in specialised centres

Management of Complete Rectal Prolapse in adults:

Assess (clinical, DRE, history)

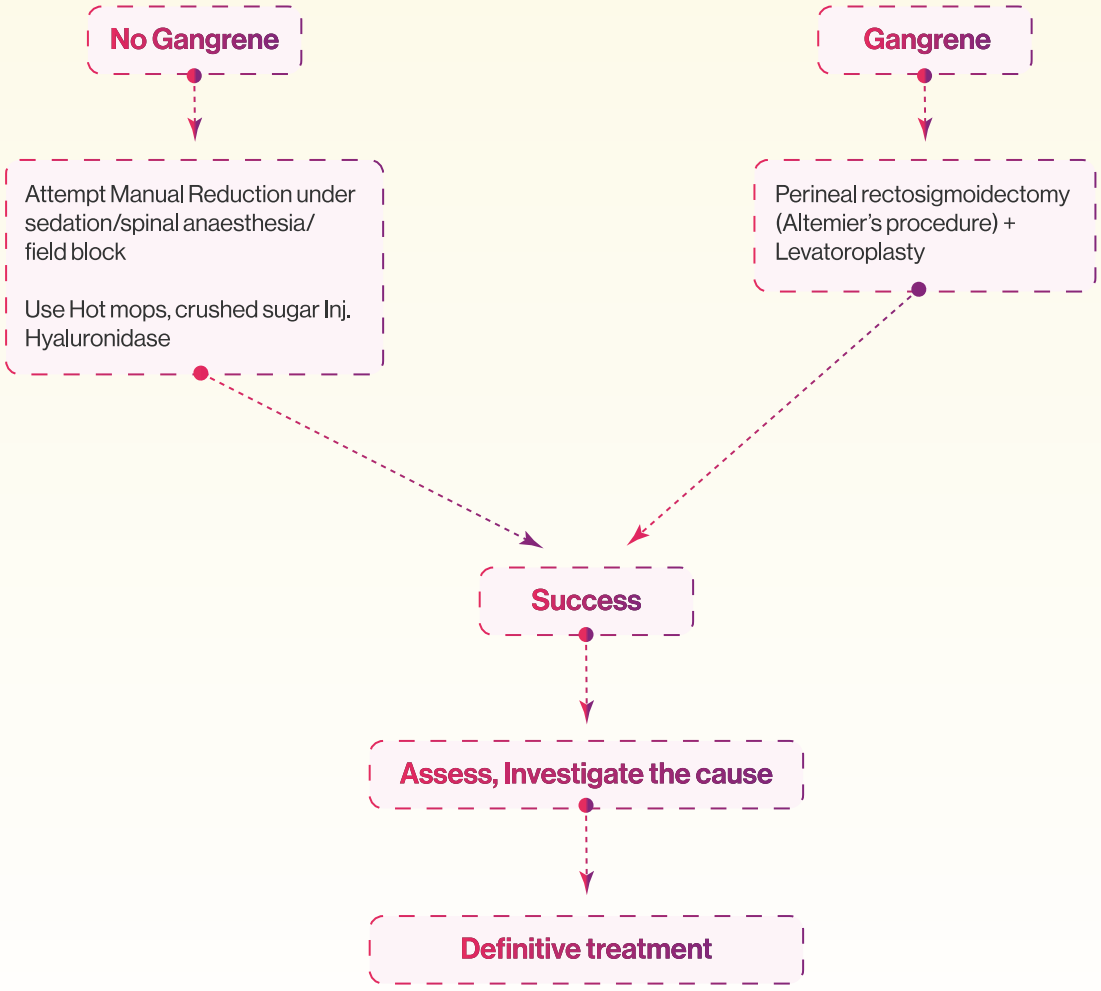
A) Type & size
B) Condition of prolapse (gangrenous/irreducible)
C) Patient status: Age, GC, comorbidities, drugs, mental health
D) Cause: ulcer, growths
E) Associated symptoms: severity & duration of constipation, fecal incontinence
F) Surgical expertise

Investigations (for elective, non-emergent causes)

i. Colonoscopy
ii. MR dynamic defecography
iii. Anorectal manometry

According to presentation

1. Acute irreducible prolapse



2. Reducible prolapse

Patient fit for GA; longer life expectancy

Abdominal surgical procedures (open/Lap/Robotics):

I. Rectopexy
- Mesh (anterior or posterior)
- Suture - Posterior (most common)

II. Resection rectopexy
- For significant prolonged constipation & long redundant sigmoid colon

III. Anterior Resection

Goals of surgery

1. Correct prolapse
2. Correct functional issues: constipation/incontinence
3. Avoid creating new bowel dysfunction

Important adjuncts to surgery

1. Dietary regimen
2. Pelvic floor exercises
3. Biofeedback
4. Follow-up

Very frail, elderly, injury/disease of spinal cord, unfit for GA

Perineal procedures:

i. Anal encirclement for very frail patients

ii. Altemeier procedure (perineal rectosigmoidectomy)

iii. Perineal stapled prolapse resection

RECTAL CANCER

Dr. Soumen Das

This care pathway is based on NCCN guidelines and recent evidence on Total Neoadjuvant Therapy (TNT).

1. Initial Evaluation & Work-up

- Digital rectal exam, proctoscopy
- Colonoscopy + Biopsy (MMR/MSI)
- Serum CEA
- MRI Pelvis (T, N, CRM, MRF, EMVI)
- CT Thorax/Abdomen ± PET-CT
- Endo-USG if MRI contraindicated
- Stoma therapist consult; fertility counseling

2. Care Pathway (Simplified Flow)

- Diagnosis & Staging ⟶
- T1–T2 N0 ⟶ Surgery (TME) ⟶ Adjuvant if adverse features
- T3N0 CRM– ⟶ Surgery ± Neoadjuvant therapy
- Locally Advanced (T3 CRM+, T4, N+, EMVI+, MRF+) ⟶
  - Total Neoadjuvant Therapy (TNT):
    - Induction Chemo ⟶ CRT ⟶ TME
    - SCRT (5x5 Gy) ⟶ Chemo (FOLFOX/CAPOX) ⟶ TME
  - Restaging: MRI + Proctoscopy ± Biopsy
  - If Complete Response ⟶ Watch & Wait (OPRA)
  - If Residual Disease ⟶ TME Surgery
- Metastatic (oligometastatic, resectable) ⟶ Multidisciplinary resection ± systemic therapy

3. Special Considerations

- dMMR / MSI-H: Consider immunotherapy (Dostarlimab)
- Delay after SCRT possible (Stockholm III)
- Adjuvant therapy not mandatory after TNT
- Survivorship care: stoma, rehab, psychosocial support

ACUTE PANCREATITIS

Dr Sukanto Roy

Two of 3 following Criteria:

1) Abdominal pain consistent with disease; 2) Serum Amylase/lipase > 3 times the upper limit of normal; 3) Characteristic findings from abdominal imaging

Initial assessment and Risk stratification:

Ranson's criteria, APACHE II criteria, BISAP score, CT severity index, organ compromise, CRP, BUN, Hematocrit (HCT), SIRS

Findings associated with severe course from initial Assessment

Patient characteristics: Age >55 years, BMI> 30 Kg/m2, altered mental status, co-morbid condition

Presence of SIRS

Lab parameters: BUN >20, HCT>44, elevated creatinine

Radiology: pleural effusion, pulmonary infiltrate, multiple or extrapancreatic collection

Mild AP:

IV fluid, NPO, IV analgesic, ± NG suction, start orally after control of pain

Severe AP:

Admit in monitored bed, NPO, IV fluid **(moderately aggressive fluid therapy, Ringer's lactate is the preferred fluid)**, Nutritional support, IV analgesic, ± NG tube, ± intubation, 2-4 houlrly monitoing and daily basic investigations. **Role of Antibiotic is debatable. ERCP:** is indicated for acute cholangitis and biliary obstruction

Complete recovery

Clinical deterioration

After 4 days, preferbably between 6 to 10 days

For biliary AP:

Early cholecystectomy for mild AP, delay for 6-8 weeks for severe AP

Contrast enhanced CT scan

Pancreatic necrosis

Fluid collection:

follow up with USG/CT scan

Edematous changes

Sterile

Infected

Resolution

Infection

Pseudocyst

Observation

Clinical deterioration

IV antiobiotics Debridement:

Endoscopic, Laparoscopic, Open surgery

Minimally invasive procedures are preferred

Drainage:

PCD/ Endoscopic/ Surgey (rarely)

Continue conservative managements

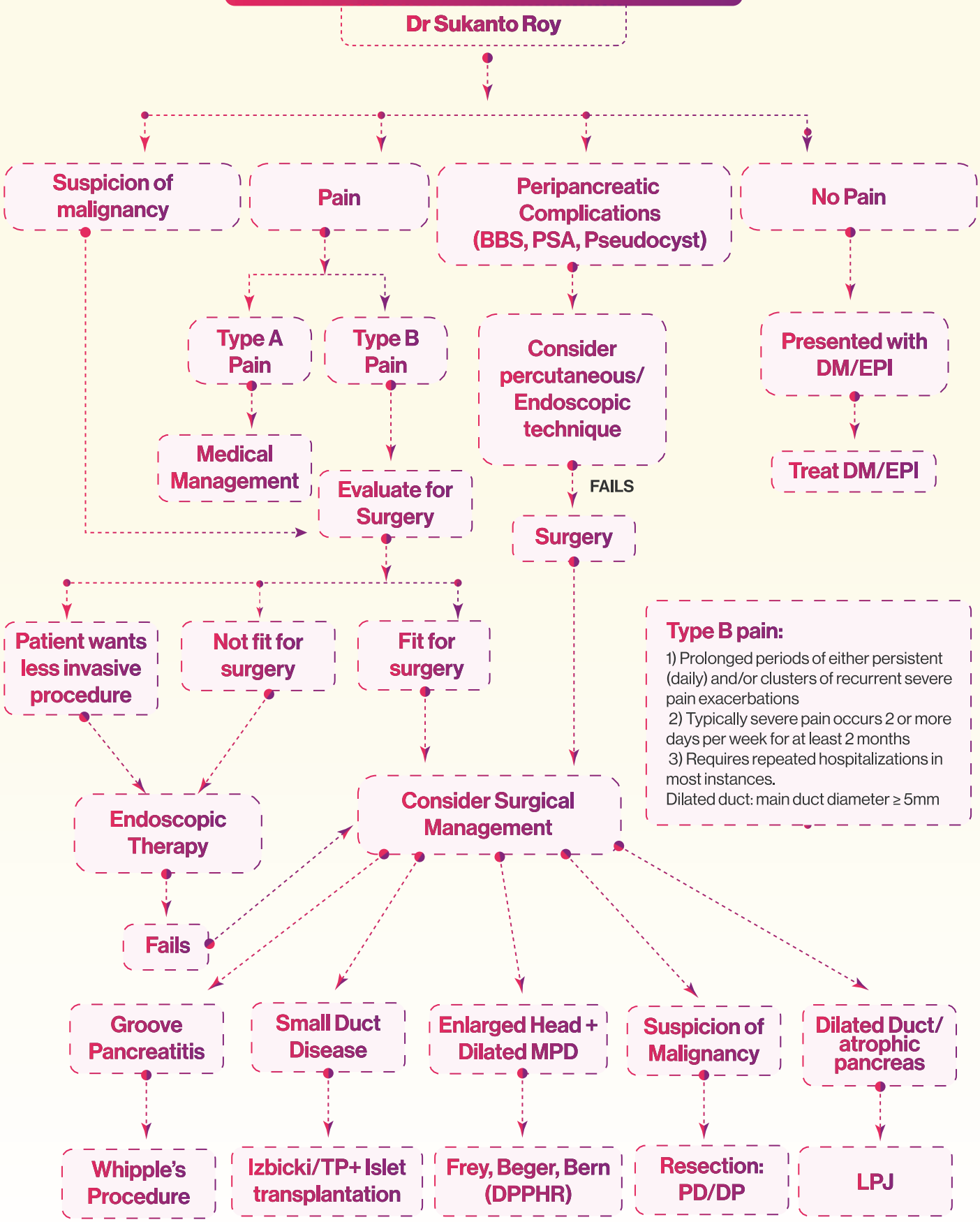
Develops symptoms or pseudocyst-related complications

Abbreviations:

PCD: percutaneous drainage, NPO- Nil per oral, SIRS: systemic inflammatory response syndrome, BUN: blood urea nitrogen, CRP: C reactive protein

CHRONIC PANCREATITIS

Dr Sukanto Roy



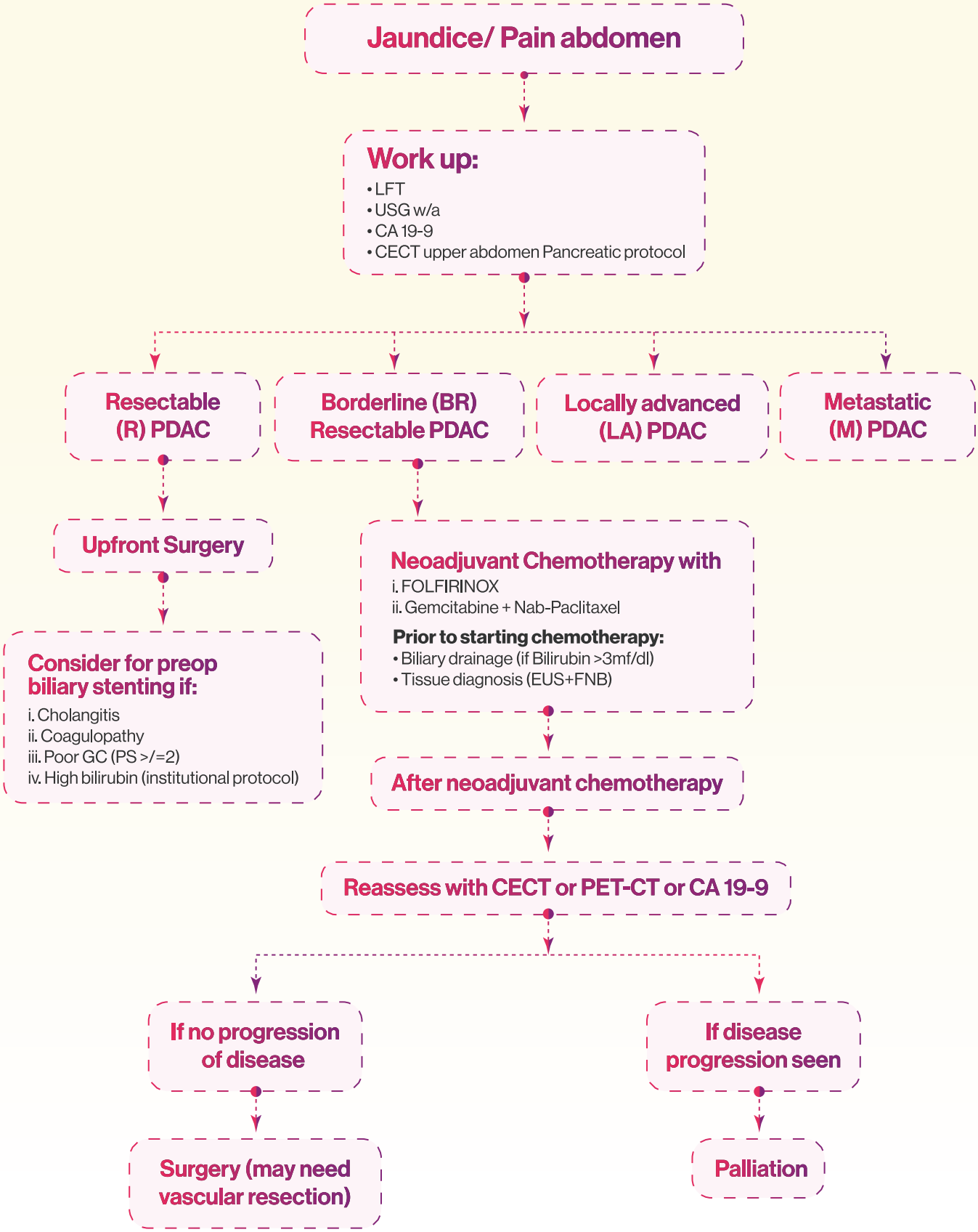
Type B pain:

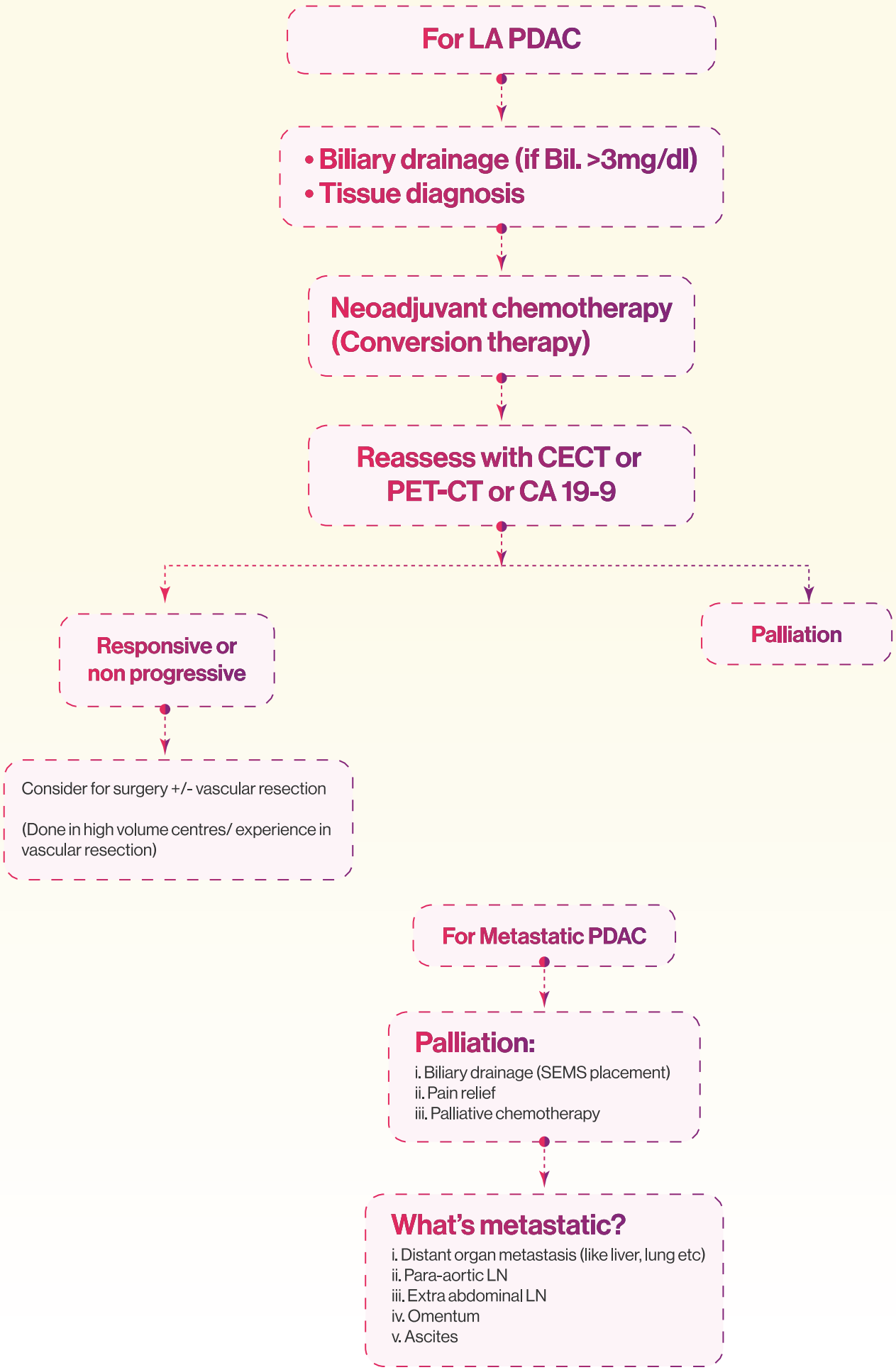
1) Prolonged periods of either persistent (daily) and/or clusters of recurrent severe pain exacerbations
2) Typically severe pain occurs 2 or more days per week for at least 2 months
3) Requires repeated hospitalizations in most instances.
Dilated duct: main duct diameter ≥ 5mm

Algorithm for the management of chronic pancreatitis. PD: Pancreaticoduodenectomy; DP: distal pancreatectomy; TP: Total pancreatectomy, PSA- Pseudoaneurysm, BBS- Benign biliary stricture, DM- Diabetes mellitus, EPI- Exocrine pancreatic insufficiency

PANCREATIC CANCER

Dr Sanjay Mandal




For LA PDAC
• Biliary drainage (if Bil. >3mg/dl)
• Tissue diagnosis
Neoadjuvant chemotherapy (Conversion therapy)
Reassess with CECT or PET-CT or CA 19-9
Responsive or non progressive
Palliation
Consider for surgery +/- vascular resection
(Done in high volume centres/ experience in vascular resection)
For Metastatic PDAC
Palliation:
i. Biliary drainage (SEMS placement)
ii. Pain relief
iii. Palliative chemotherapy
What's metastatic?
i. Distant organ metastasis (like liver, lung etc)
ii. Para-aortic LN
iii. Extra abdominal LN
iv. Omentum
v. Ascites

CYSTIC NEOPLASM OF PANCREAS

Dr Supriyo Ghatak

Prevalence: ~10%
Increased incidental detection due to improved CT/MRI
80% of incidentally detected cysts are Branched duct IPMN
Cyst fluid analysis of different markers are not always definitive (Risk: needle tract seeding)
Commonest Differential diagnosis: **Pseudocyst of pancreas**
Few Other Differentials:
- Congenital cyst/ simple cyst
- Cystic NET
- Cystic adeno Carcinoma
- Lymphangioma
- Duodenal diverticulum

CYSTIC LESION IN THE PANCREAS

- History of pain suggestive of Acute pancreatitis/ Chronic Pancreatitis
- History of trauma
- Cyst Fluid amylase > 6000 U/ml
- Viscosity< 1.6
- CEA can be high
- No mucin

→ Consider **Pseudocyst**

- Hormonal symptoms
- Enhancing on arterial phase
- Increased serum Chromogranin A

→ Consider **NET**

- History of jaundice, weight loss, anorexia.
- High serum CA 19-9

→ Consider **Adeno carcinoma**

- Air inside the cystic lesion
- Endoscopic visualization of diverticulum

→ Consider **duodenal diverticulum**

Contrast enhanced CECT or **MRI** abdomen
(EUS, Contrast EUS, FNA needed in some cases when the diagnosis is not reached with CT or MRI)

Well defined, Solid with cystic tumour

Solid Pseudopapillary tumour

Resection, if fit

No communication with PD
Cyst fluid:
Mucin +
Viscosity >1.6
Lipase <6000 U/ml
CEA> 192 ng/ml

Mucinous Cystic Neoplasm

Symptomatic or > 4cm, risk factors like mural nodule : Resect

(Ovarian like stroma on biopsy characteristic)

Multicystic, lobulated, each cyst <20mm, central scar, no communication with PD
No mucin, CEA, Lipase not elevated

Serous cystadenoma

If asymptomatic Observe

cyst >5 mm that communicates with MPD: **BD-IPMN**
segmental or diffuse dilation of the MPD of >5 mm without other causes of MPD obstruction: **MD-IPMN**
Combination of both: **Mixed IPMN**
Mucin+
CEA> 192 ng/ml
KRAS mutated
GNAS wild

IPMN

High risk stigmata (Any one) : Resect if fit
(1) obstructive jaundice in a patient with cystic lesion of the head of the pancreas,
(2) an enhancing mural nodule >= 5 mm or solid component,
(3) main pancreatic duct >=10 mm
(4) suspicious or positive results of cytology

Worrisome features
(1) acute pancreatitis,
(2) increased serum level of CA19-9,
(3) new onset or acute exacerbation of DM within the past year,
(4) cyst >=30 mm,
(5) enhancing mural nodule < 5 mm,
(6) thickened/ enhancing cyst walls,
(7) MPD >=5 mm and <10 mm,
(8) abrupt change in calibre of pancreatic duct with distal pancreatic atrophy,
(9) lymphadenopathy
(10) cystic growth rate: 2.5 mm/year or more

Resect:
- if young and fit
- Multiple worrisome features
- Multiple acute pancreatitis attacks

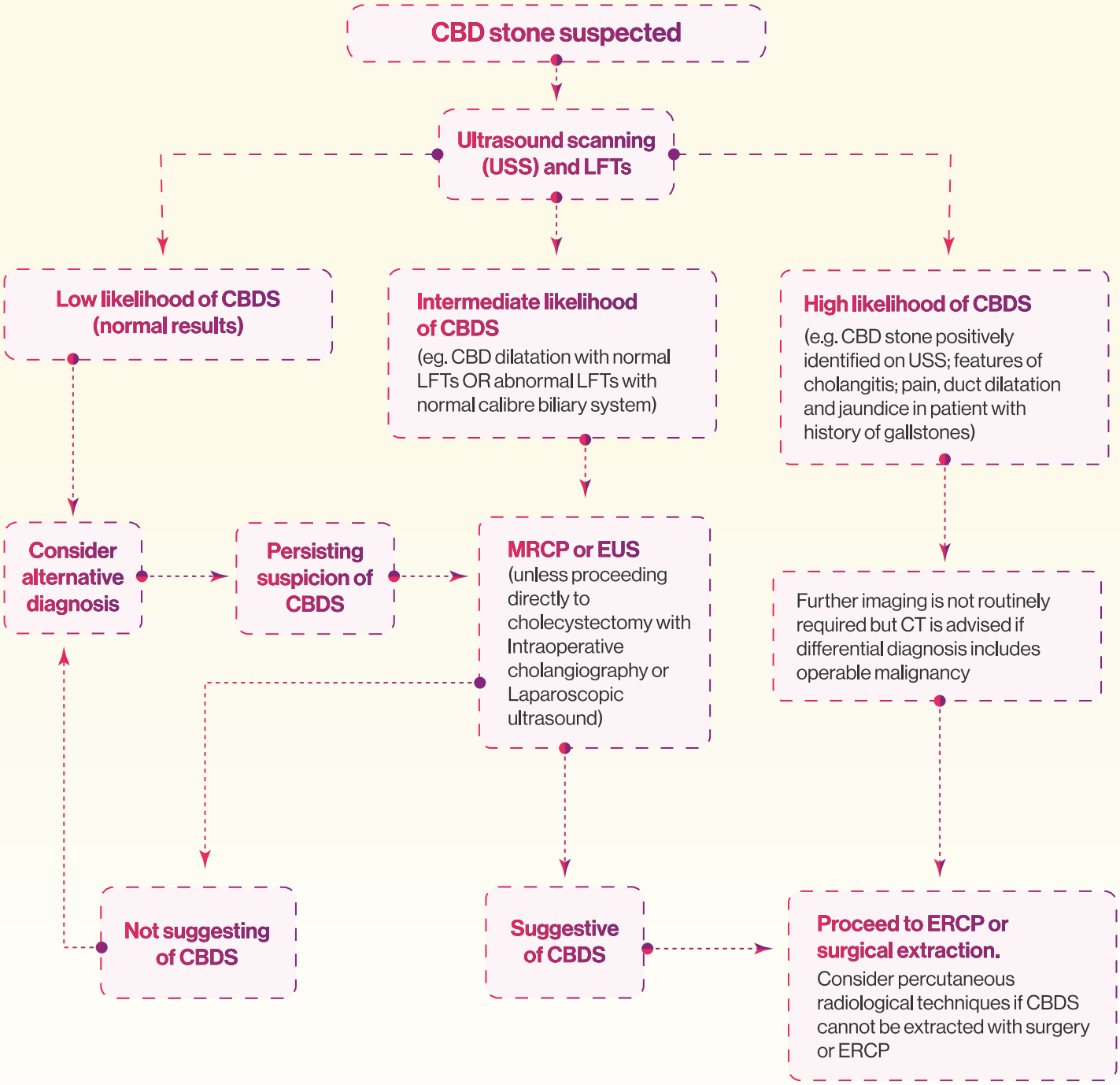
Operative principles:

- If the suspicion of invasive carcinoma is high: Open/ lap/ robotic radical pancreatectomy with lymphadenectomy
- If suspicion of invasive carcinoma is low, organ preserving pancreatectomy
- Frozen section (IPMN): if margin shows high grade dysplasia or invasive carcinoma further resection including total pancreatectomy may be needed

Surveillance and follow up:
- 6 months to 1 year interval till patient is unfit to undergo surgery

CHOLEDOCHOLITHIASIS

Dr Arkaprovo Ray



CBDS: Common bile duct stones. ERCP: endoscopic retrograde cholangiopancreatography; EUS: endoscopic ultrasound; IOC: intraoperative cholangiography; LFT: liver function test; LUS: laparoscopic ultrasound; MRCP: magnetic resonance cholangiopancreatography; USS: ultrasound scanning.

BILE DUCT INJURY

Dr. Shibajyoti Ghosh

Prevention is better than cure

- Follow principles of safe cholecystectomy
- **Informed consent** in patient's vernacular
- Cholelithiasis = Benign disease ⟶ Postponing surgery does not harm patient
- Hostile Abdomen/Difficult calot's ⟶
  - Partial Cholecystectomy
  - Cholecystostomy
  - Do nothing – Swallow your pride

Intraoperative Detection

Bile seen in operative field:
- Greenish Bile- Gall Bladder
- Golden Bile- Liver/CHD/CBD/Proximal ducts

Immediate Steps

- Identify level and type of injury
- Assess availability of expert help and logistics

Expert Help + Logistic Support Available?

Yes

- Lateral Tear/ Transection without segment loss ⟶ Primary repair +/- T-Tube/Stent
- Segment Loss ⟶ Roux-en-Y-Hepaticojejunostomy

No

- Lateral Tear/ Transection without segment loss ⟶
  - ☑ Distal Injury: Repair over T-tube/stent
  - ☑ Proximal injury: Place drain and refer
- Segment Loss ⟶ Place drain and refer

Post-operative Detection

BILOMA

- Stable: CECT/USG whole abdomen ⟶ Percutaenous Drainage
- Unstable: Exploratory laparotomy followed by peritoneal lavage and drain placement

JAUNDICE

- MRCP to delineate level of stricture
- If complete cutoff- Plan delayed repair(>6 weeks)
- Retained stone in CBD- ERCP + stone extraction + stenting

BILIARY PERITONITIS

- CECET whole abdomen ⟶ Exploratory laparotomy followed by peritoneal lavage and drain placement
- Rule out other organ injury (Duodenum/Transverse Colon/Small gut)

Documentation

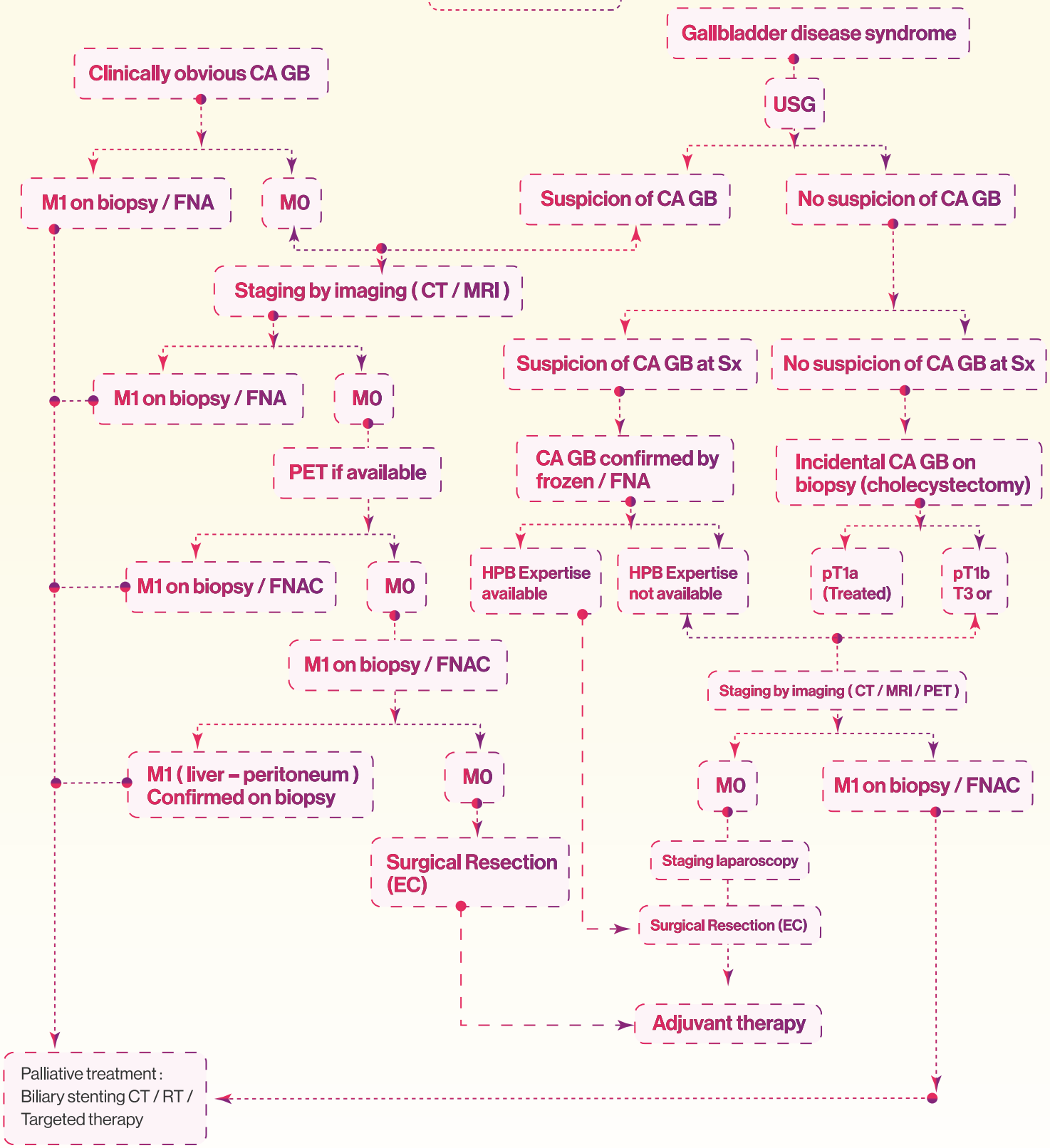
- Record details of injury/obtain HPE report to rule out malignancy
- Inform and obtain signature from patient's close relatives
- Timely referral to specialized units

PREVENTS MEDICOLEGAL ISSUES

'WHEN IN DOUBT- DRAIN AND REFER'

CARCINOMA GB

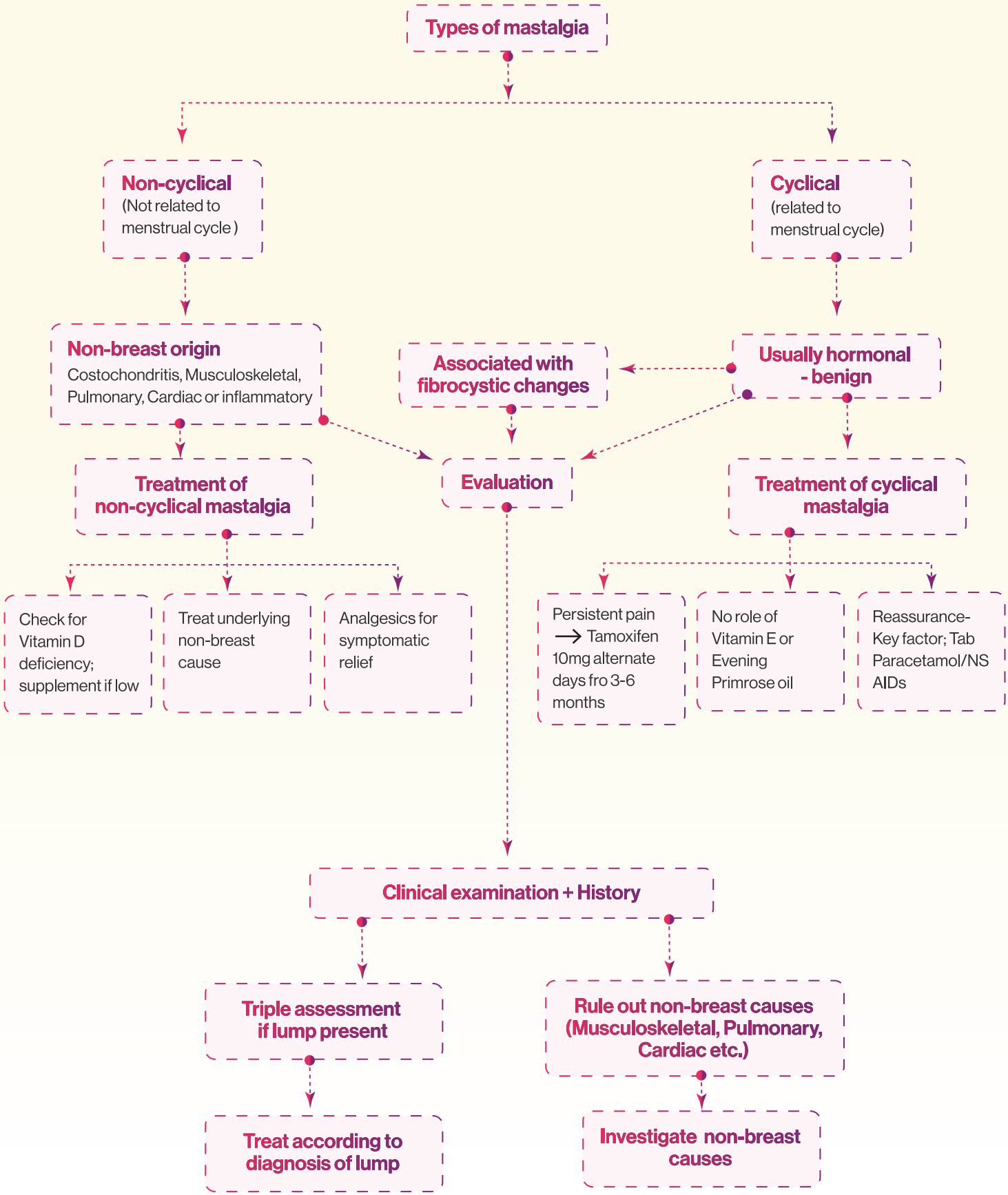
Dr Ramdip Ray



Thickwalled gallbladders are often a diagnostic challenge. Even high quality cross sectional imaging may not reliably differentiate cancer from chronic cholecystitis or xantho-granulomatous cholecystitis. To minimize the chances of radical surgery in benign conditions the Lucknow approach (V K Kapoor et al) has been adopted by some centres. An anticipatory extended cholecystectomy (AEC), for doubtful thick walled gallbladders involves removal of GB with a 2-cm wedge of liver, which is then subjected to frozen section histological examination. The addition of lymphadenectomy in cases which turn out to be malignant completes the procedure for CA GB, but avoids the morbidity of lymphadenectomy in an undeserving patient.

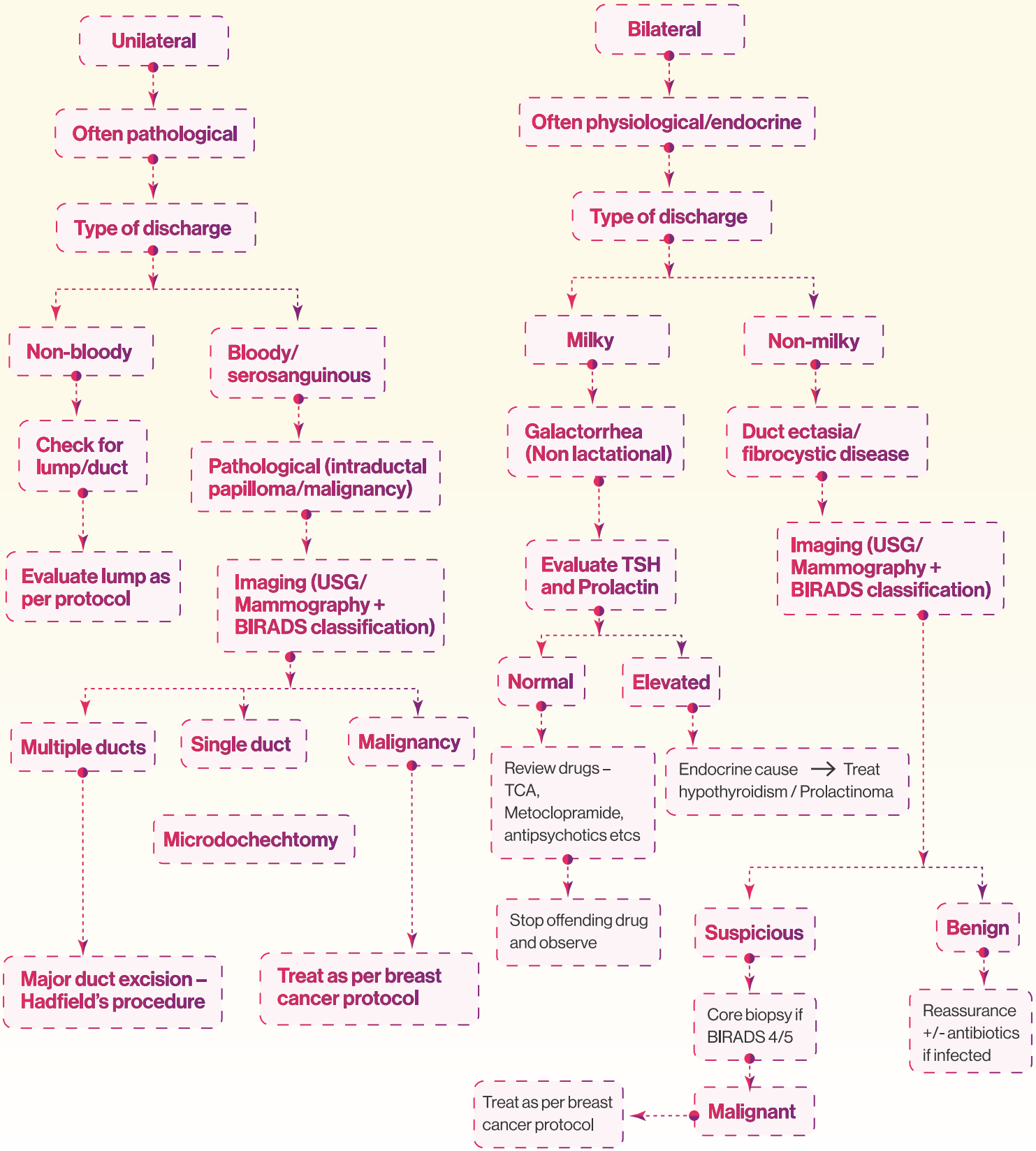
MASTALGIA

Dr Diptendra K. Sarkar, Dr Srija Basu, Dr Ronit Roy



NIPPLE DISCHARGE

Dr Diptendra K. Sarkar, Dr Srija Basu, Dr Ronit Roy



MASTITIS

Dr Diptendra K. Sarkar, Dr Srija Basu, Dr Ronit Roy

Consider IGM if Recurrent/Non-Resolving

Occurs within 5 Years of Pregnancy

May be Associated with Diabetes/Insulin Resistance

Lump / Skin Edema / Sinus / Ulcers

Radiology Non-Specific

Do Pus Culture + Exclude TB

Core Biopsy

Non-Caseating Granuloma Confirms IGM

Surgery for Unifocal Sinus Lesion

Treat Secondary Infection

Steroids 10–20 mg BD for 3–4 Months

Lactating?

Yes

Lactational Mastitis

Cause: Milk Stasis due to Faulty Latching/Nipple Abnormalities

Pain, Swelling, Fever, Erythema

Start Empirical Antibiotics

Continue Breast Feeding/ Expression

HRUSG Breast

Abscess Present?

No

Non-Lactational Mastitis

Cause: Ductal Dilatation → Duct Ectasia → Periductal Mastitis

presents as Periareolar Swelling, Erythema, Induration

HRUSG Breast

Empirical Antibiotics + Support

Abscess Present?

No

Continue Medical Treatment

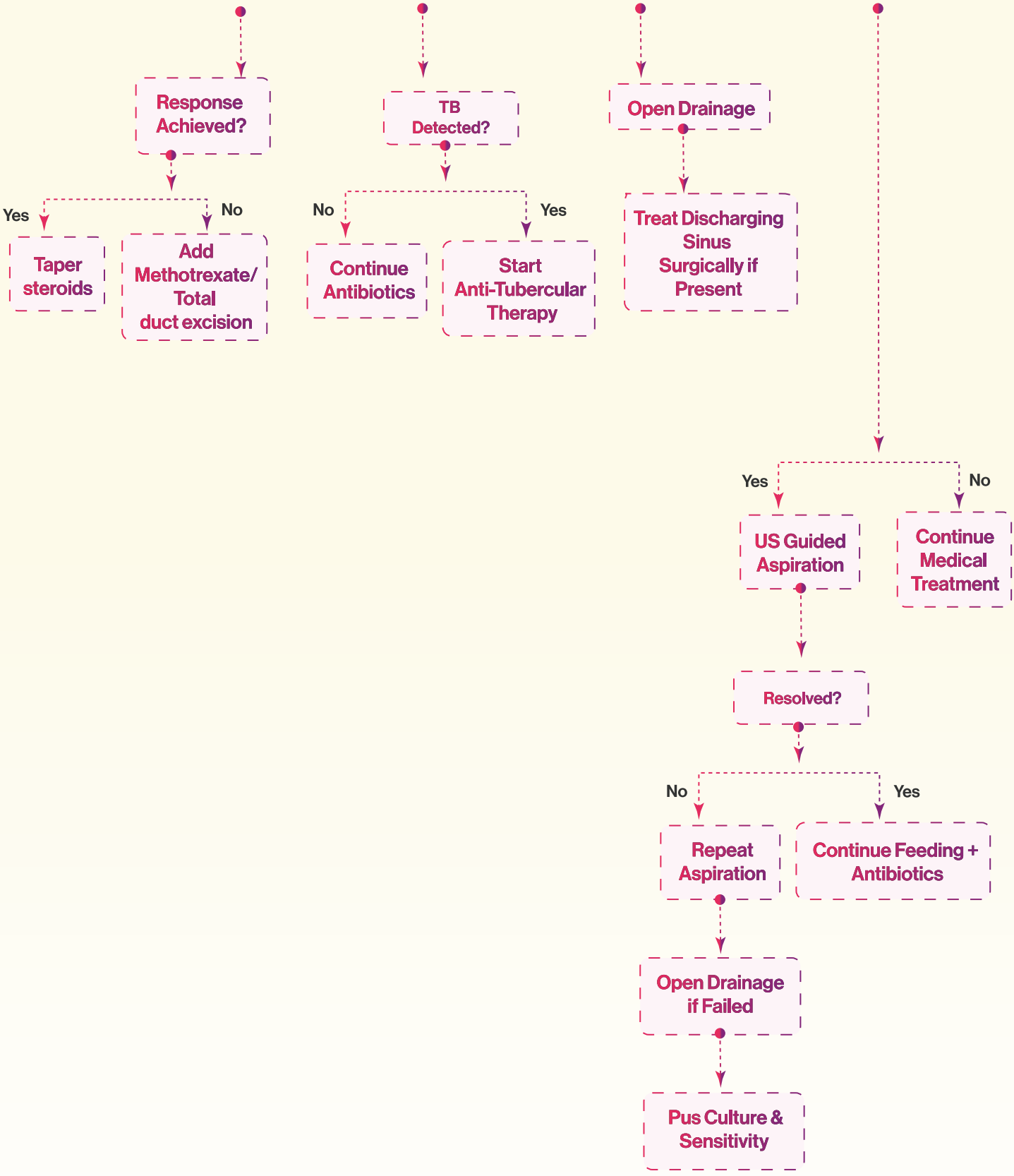
Yes

US Guided Aspiration

Culture-Based Antibiotics

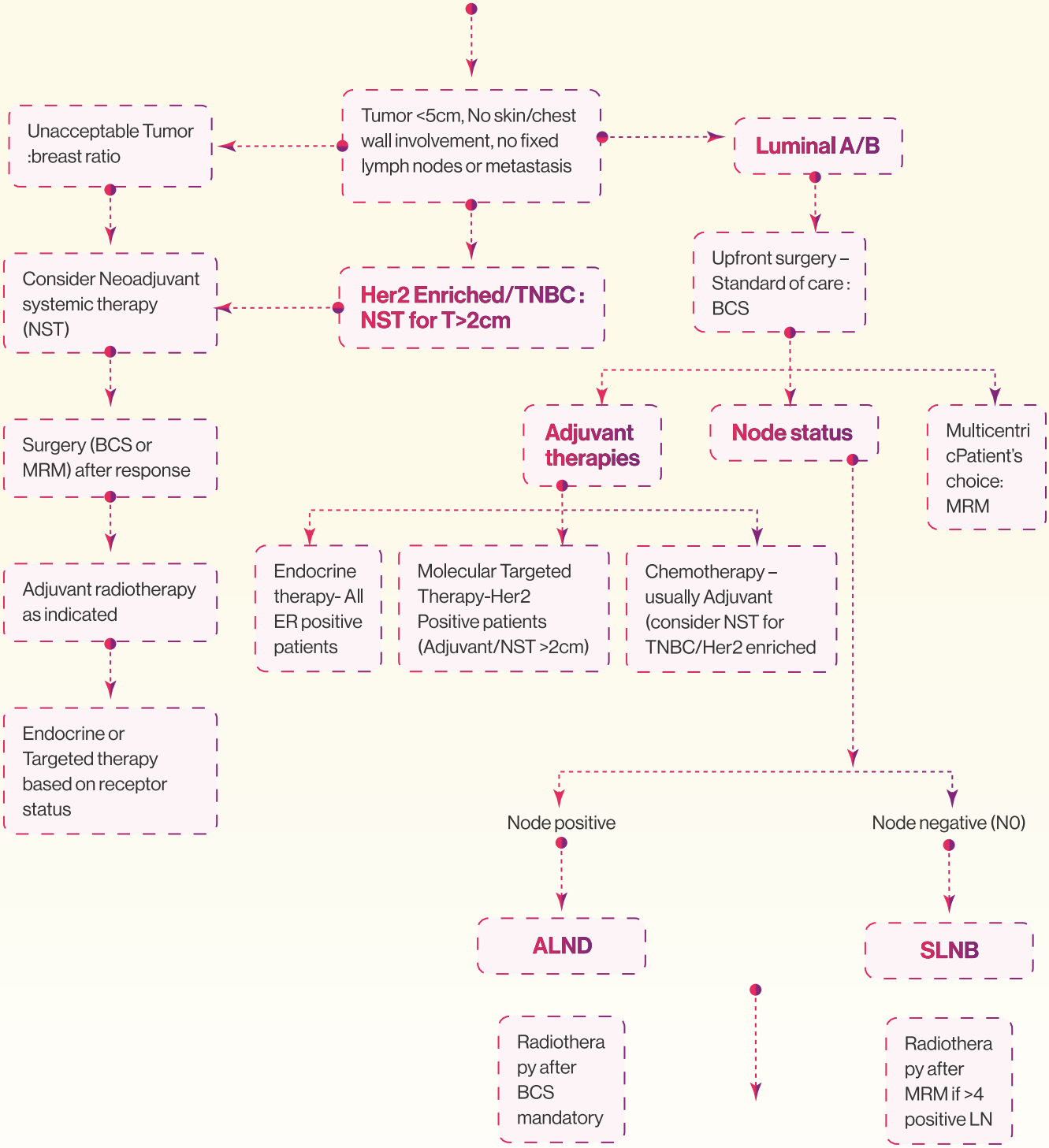
Aspiration Failed?

Yes


Response Achieved?
Yes
No
Taper steroids
Add Methotrexate/ Total duct excision
TB Detected?
No
Yes
Continue Antibiotics
Start Anti-Tubercular Therapy
Open Drainage
Treat Discharging Sinus Surgically if Present
Yes
No
US Guided Aspiration
Continue Medical Treatment
Resolved?
No
Yes
Repeat Aspiration
Continue Feeding + Antibiotics
Open Drainage if Failed
Pus Culture & Sensitivity

EARLY BREAST CARCINOMA

Dr Diptendra K. Sarkar, Dr Srija Basu, Dr Ronit Roy



LOCALLY ADVANCED BREAST CARCINOMA

Dr Sanjit Agrawal

LABC (non metastatic - T3N1, any T +N2 or N3, T4 + any N)

Mammogram+USG, Core biopsy (skin biopsy if needed in inflammatory cancer), staging (PETCT + MRI brain- in HER2+ and TNBC)

Upfront surgery
Very old age or multiple comorbidities who are unfit for chemotherapy, selected T3N1 cases with luminal A (low Ki67)

NACT

NAET
unfit for chemotherapy but inoperable at present

LUMINAL HER2 NEG

4 cycles of ddEC- 4 cycles ddT
Or
3 weekly EC -T / 6 cycles TC (C/I for anthracyclines)

TNBC

Paclitaxel-carboplatin weekly for 8 cycles– 4 cycles EC + Pembrolizumab 3 weekly (7-8 cycles neoadjuvant, 9 more cycles in adjuvant setting)

If Pembrolizumab not affordable:

Age <50 years: 4 cycles ddEC- 8 cycles Pacli-Carbo

Age >50years: 8 cycles of ddEC-ddT

HER2 POSITIVE

TCHP (high nodal burden, intra tumoral heterogenicity- add anthracycline)
EC-TH (not affordable for pertuzumab)

Mastectomy+/- reconstruction or BCS (T3 with good response, Select T4 with focal skin involvement)
Axillary staging – SLNB/ALND

Adjuvant RT to chest wall/Breast + tumour boost + Nodal basin

HT for 10 years (AI in postmenopausal, Tamoxifen+/- OFS (residual node positive) in Premenopausal)+ Bisphosphonates + CDK 4/6 I (residual N2 or residual N1+ G3/T3), Olaparib in non PCR+BRCA positive+ CPS-EG score >/=3

Maintenance trastu +/- Pertu
TDM1 in Non PCR
+HT in HR positive

Capecitabine in non PCR,
Olaparib in non PCR +BRCA positive

Abbreviations:

- ddEC- Dose-dense Epirubicin and Cyclophosphamide
- ddT- Dose-dense Taxane
- TCHP- Docetaxel (Taxotere), Carboplatin, Trastuzumab (Herceptin), Pertuzumab
- EC-TH- Epirubicin, Cyclophosphamide followed by Taxane and Herceptin

DIFFERENTIATED THYROID CANCER

Dr Ramanuj Mukherjee

Initial Clinical Evaluation

- Thyroid Nodule Detected on Neck US, assess risk.
- FNA of nodule based on ATA criteria
- Avoid FNA for sub-centimeter nodules, unless high risk features present

Pre-Op Diagnostic Workup (R7-R10)

- Neck US for gland and nodes mandatory
- CT/MRI only for suspected invasion
- Somatic Mutation testing should not guide surgical extent.
- Routine pre-op Tg screening not recommended.

Active Surveillance (R11 - R14)

- Must be considered for ≤1 cm intrathyroidal PTC without LN involvement or ETE
- Monitor with US every 6-12 months
- Shift to surgery, in case of new growth, new nodes, or if favored by Patients.

Initial Surgical Management (R15 - R17)

- Must be considered for ≤1 cm intrathyroidal PTC without LN involvement or ETE
- Monitor with US every 6-12 months
- Shift to surgery, in case of new growth, new nodes, or if favored by the patient.

Standardized Histopathology Reporting (R27)

- Document tumor size, margins, number and extent of vascular invasion, LN count and size, extranodal extension and histological variant
- Standardized reporting helps estimate recurrent risk

ATA 2025 Risk Stratification (R28)

- Integrates pathology, AJCC staging, post-op US status, and Tg trends.
- Classified as Low, Intermediate Low, Intermediate High, High Risk
- Molecule markers may be used, not mandatory

RAI in Low Risk Category (32A)

- Routine RAI not recommended
- If used -> low dose (30 - 50 mCi)
- **Goal:** Remnant Control

RAI in Intermediate Risk Category (32B)

- Selective RAI use depending in nodal burden, ETE, histology.
- Dose: 30 - 100 mCi
- Acts as remnant ablation ± adjuvant therapy

RAI in High Risk and Metastatic Disease (R32 C-D)

- RAI recommended
- High Risk Dose: 100 - 150 mCi
- Distant Metastases: 100 - 200 mCi or dosimetry based

Preparing for RAI (R34 - R35)

- TSH elevation via withdrawal or rhTSH stimulation.
- Low Iodine Diet 1-2 weeks prior therapy.
- Ensure medication, and rule out pregnancy if indicated

Post Therapy Imaging and Safety (R36 - R40)

- Assess disease extent by post-therapy WBS
- Use SPECT-CT for improved localization.
- Counsel regarding radiation safety, possible salivary gland injury, and its prevention.

Early Response Assessment (R29)

- Classify response as Excellent, Indeterminate, Biochemical Incomplete or Structural Incomplete.
- Category determines TSH targets and follow up frequency

TSH Management in Follow-Up (R45-R46)

- High-risk/ Incomplete response: maintain TSH <0.1 mIU/L
- Intermediate: 0.1 - 0.5 mIU/L
- Excellent Response/ Low Risk: low normal TSH range.
- Adjust suppression to balance recurrence risk vs. adverse effects

Tg and TgAb Surveillance (R47)

- Measure Tg and TgAb every 6 - 12 months initially.
- Use trends instead of isolated values.
- Tg levels to be interpreted as per TSH level and response category.
- Tg ↑ or TgAb ↑ : evaluated using imaging

Imaging Strategy (R49 - R50)

- Neck US based on recurrence risk and Tg/TgAb trend.
- Selective diagnostic RAI: for intermediate to high risk or rising Tg.
- SPECT - CT for localization.
- FDG-PET/CT: in Tg-positive, iodine negative cases or aggressive pathology.

Persistent/ Recurrent Disease Management (R51 + R52-R58)

- Assess resectability, iodine avidity, and Tg kinetics.
- Surgery preferred for accessible lesions, RAI if avid.
- Non-avid or unresectable lesions: evaluate for RAIR

RAI-Refractory DTC (R59)

DTC is RAIR if:

- No RAI uptake at first t/t
- Loss of uptake upon later therapy.
- Mixed Uptake pattern with structural progression
- Disease progression, despite adequate RAI dose

Further RAI to be avoided.

Systemic Therapy in RAIR DTC (R61 - R75)

- Lenvatinib: first line agent for progressive RAIR; sorafenib as alternative.
- Targeted therapy for RET, NTRK, BRAF, ALK mutations
- Redifferentiation therapy to restore RAI uptake selectively.
- Systemic therapy decisions to be personalised in multidisciplinary setting.

Local T/t of Metastatic Disease (R76 - R79)

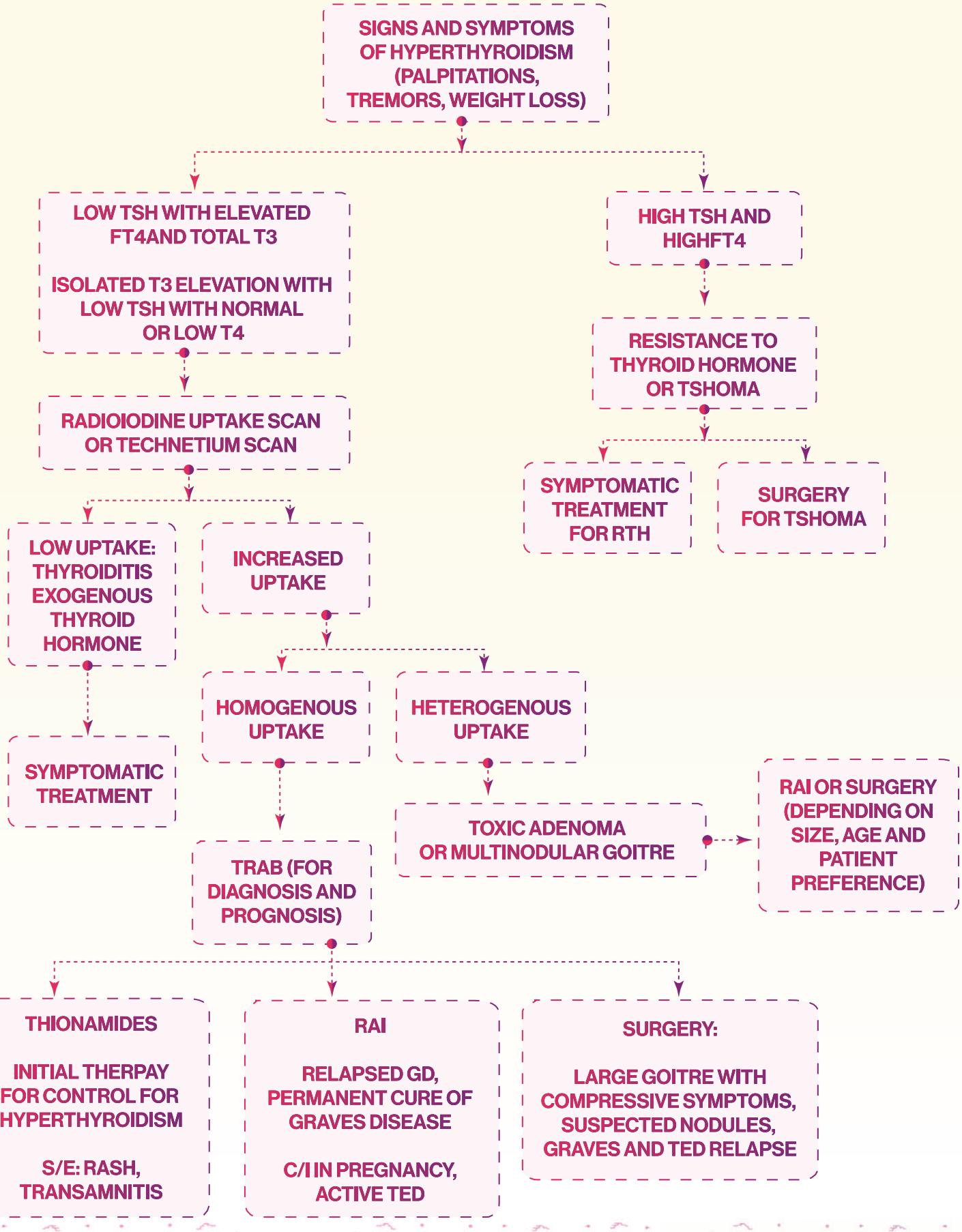
- Isolated, symptomatic mets: Surgery, Thermal Ablation or SBRT
- Bone Directed Agents for Bone mets (denosumab, bisphosphonates)
- Brain mets amy require Surgery or SRS with / without systemic therapy (as required).
- For Symptom control, local therapy preferred.

Special Population and Survivorship (R80-R84)

- Pregnancy: Avoid RAI: surgery only in progressive disease in second trimester.
- Clinical Support, Counselling and Monitoring for long term side-effects of Thyroidectomy.
- Survivorship care to address, mental health, financial strain, and QoL.
- Allow Clinical trial in advanced disease.

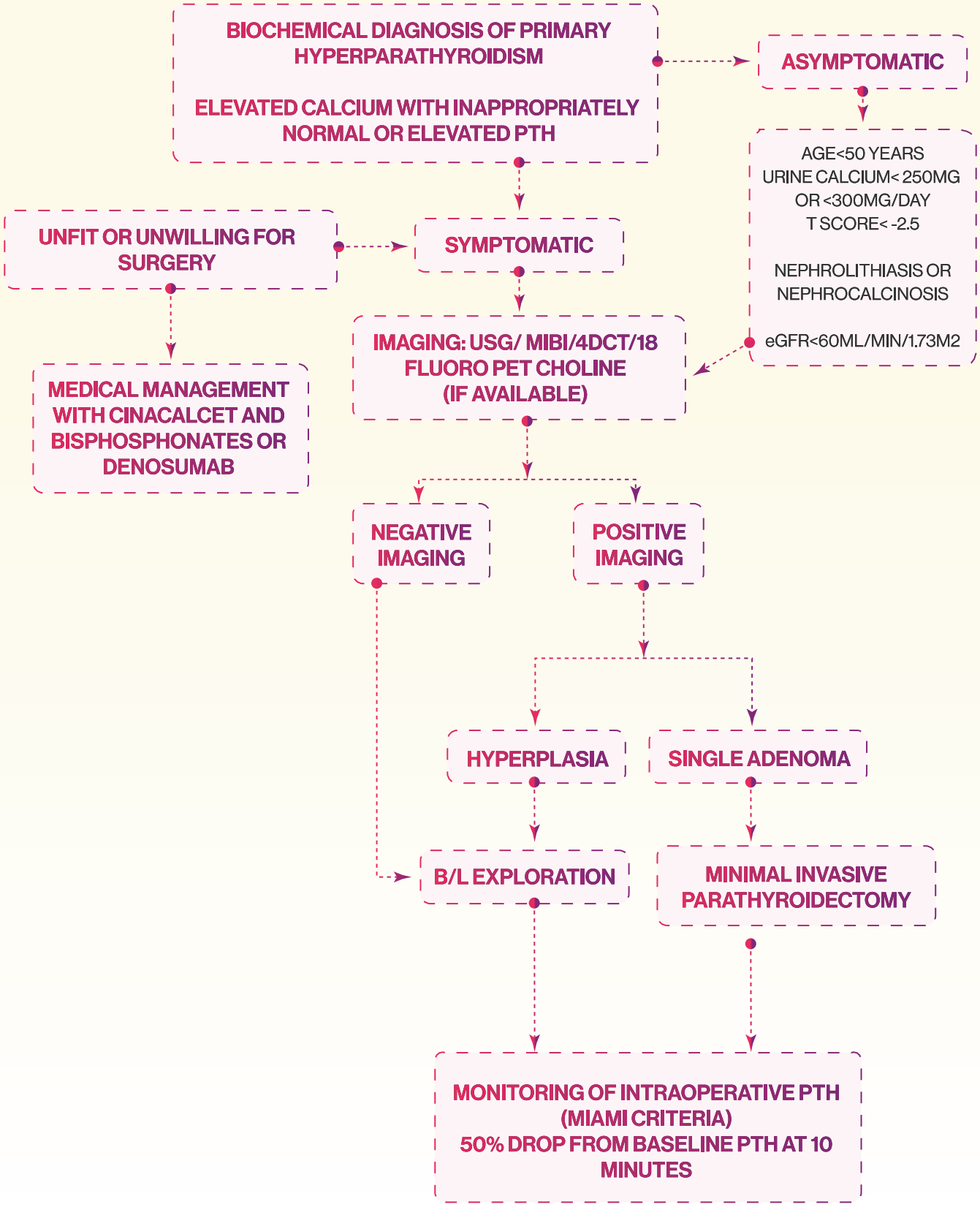
HYPERTHYROIDISM AND GRAVES DISEASE

Dr Sujoy Ghosh



HYPERPARATHYROIDISM

Dr Sujoy Ghosh



ADRENAL INCIDENTALOMA

Dr Dhritiman Maitra

ALL

Cortisol post overnight 1mg dexamethasone suppression test (ODST)

<1.8 ug/dL

No further evaluation

>1.8 ug/dL

Overt Clinical features

YES

Overt Cushing's Syndrome

May also be confirmed by 24 hour urinary free cortisol, 6pm salivary cortisol, 8 am serum cortisol and loss of diurnal variation

NO

Mild Autonomous Cortisol secretion

Assess ACTH dependancy (ACTH, DHEA-S)

No ACTH dependency

ACTH-dependent Cushing's

High dose dexamethasone suppression test

Sometimes Bilateral Nodular Hyperplasia can present as Cushing's Syndrome If overtly symptomatic, consider Bilateral Adrenalectomy

Suppressed

Not suppressed

Evaluate Pituitary gland and treat

Look for ectopic source of ACTH and treat

<10 Hounsfield Unit and <2 cm
APW > 60%
RPW > 40%

Adrenal Adenoma (Lipid Rich)

<-20 Hounsfield Unit assume to be myelolipoma or angiomyolipoma

Observation mostly unless increasing in size or pain

ALL (Can be omitted if <2cm and Hounsfield Unit <10 on CT scan of Whole abdomen)

Plasma free metanephrines, normetanephrines and/or 24 hour urinary catecholamines

SIGNIFICANTLY INCREASED

BORDERLINE INCREASED

NORMAL

CECT Whole Abdomen with adrenal protocol, MRI abdomen and functional imaging - Ga68 DOTANOC scan/MIBG scan; Genetic testing if bilateral or if paraganglioma also seen on imaging

Re evaluate

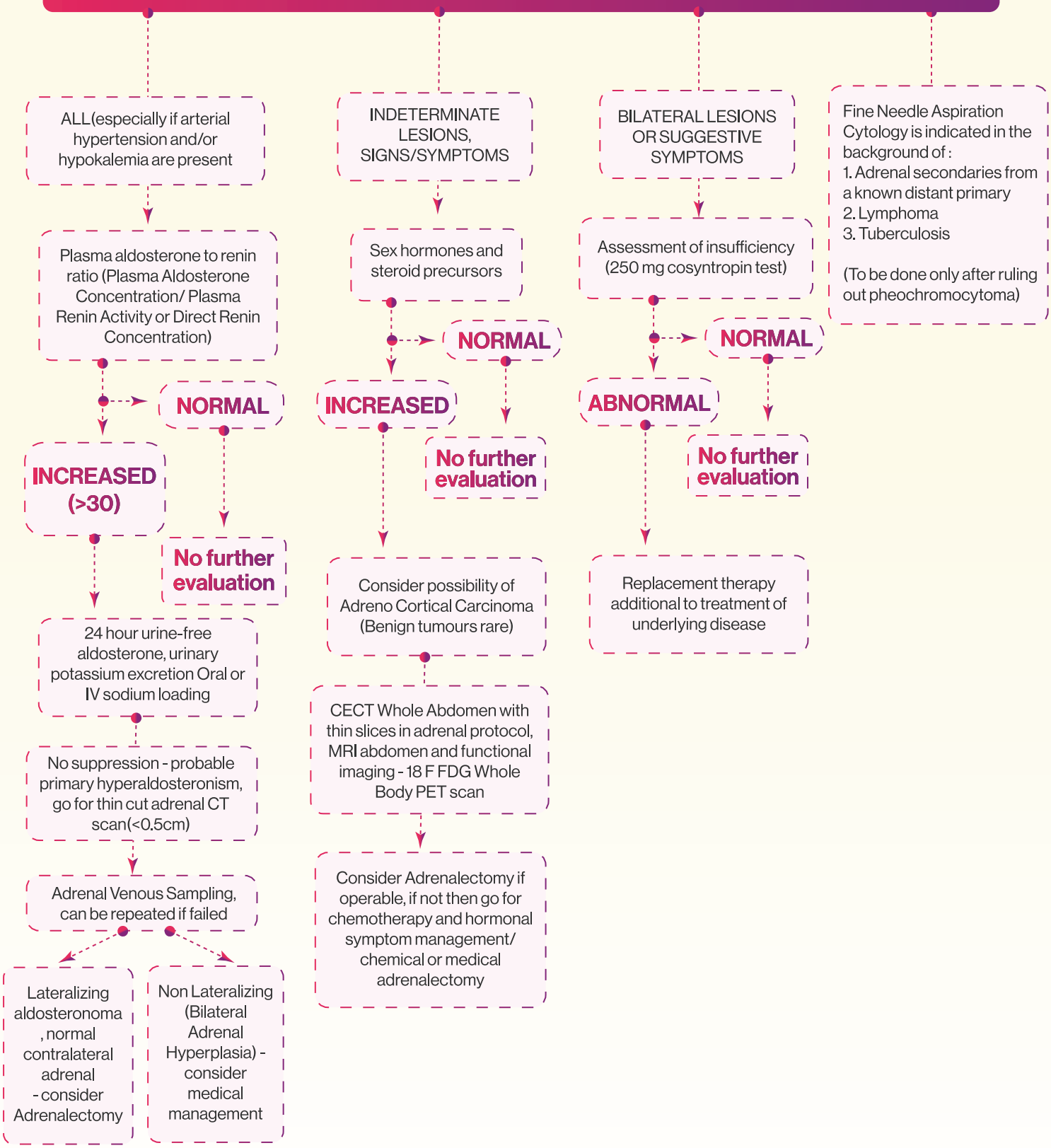
No further evaluation

Localisation by CECT Whole Abdomen with adrenal protocol

Laparoscopic Adrenalectomy ± open conversion

Preoperative optimisaton of blood pressure - alpha blockade and beta blockade and plan for Adrenalectomy (if bilateral - bilateral subcortical adrenalectomy)

ADRENAL INCIDENTALOMA (CONTD.)



ACUTE LIMB ISCHEMIA

LIMB AND USUALLY ALSO A LIFE THREATENING EMERGENCY

Dr Krishnendu Mukherjee

ATLS protocol must be followed in trauma
isolated limb fractures are dealt with after other injuries are excluded

CAUSES:

- Acute Arterial thrombosis (usually in the backdrop of atherosclerotic disease)
- Embolism (AF or the source of the embolus must be detectable)
- Vasculitic thrombosis
- Trauma including iatrogenic

PRESENTATION:

- Sudden onset monoparesis
- Tingling numbness
- Pain

(in variable combination)

Despite the teaching of 5Ps, it is crucial to remember that pain may be absent.

IN ANY SYMPTOMATIC LIMB WITH OR WITHOUT TRAUMA, DISTAL PULSES MUST BE ALWAYS EXAMINED.
Absent distal pulses and temperature difference are the most consistent signs of ALI.

HANDHELD DOPPLER

GRADE 1 Severity:
Arterial signals are absent or dampened in HHD, no discoloration, patchy sensori-motor deficits.

GRADE 2 Severity:
No Arterial signals, Venous hum present, discoloration present but blanches on pressure, dusky toes may be present. Some sensori-motor signs present.

GRADE 3 Severity:
No signals, fixed discoloration, no motor function and sensation.

Endovascular options (thrombolysis)

Urgent surgery
(thrombectomy with or without by-pass, embolectomy, arterial repairs)

Do not attempt re-vasc, counsel for primary amputation.

INITIAL MANAGEMENT:

Hydration, Oxygen, Unfractionated Heparin intravenous bolus (usually 10,000 U initially) if not contraindicated, analgesics, antibiotics, oral anti-platelet, keeping NPO.
Routine blood work (including Group & Save, Renal function, LDH, CPK), ECG & Echocardiogram, CXR should be done along with an USG mapping of the contralateral GSV.

A CT or MR Angiogram from Abdominal Aorta to pedal run-off or a direct DSA is the best investigation. A Duplex imaging is used only if any form of Angiogram is not possible.
In isolated limb trauma, eg a # lower humerus, a post-TKR ischemia, a direct local exploration of the artery is permissible if Angiogram is not possible; however availability of an autogenous vein should be confirmed pre-operatively.

Post-op Heparin should be continued and oral Vit-K antagonists started.
DOACs have better evidence in Venous thrombosis.
The limb should be kept in 0 degree, elevation or depression does not help. Rarely, a patient may need a Fasciotomy; at least 2 incisions are needed.

CHRONIC LIMB ISCHEMIA

Dr. Krishnendu Mukherjee

Patient Presentation

- Assess symptoms:
  - Claudication? (usually calf > thigh/buttock; never foot; not at rest)
  - Rest pain in foot/toes? (continuous, worse at night ⊠ Critical Limb Ischemia)
  - Ischemic ulcers or dry gangrene?
  - Consider mimics: spinal claudication; rare- venous claudication.

Determine Limb Involved

Lower limb symptoms ⟶ suspect CLI
Upper limb symptoms ⟶ consider arterial Thoracic Outlet Syndrome

Consider Etiology

Common: Atherosclerotic PAD
Uncommon: TAO (<40 yrs; now seen in women), vasculitis (e.g., Takayasu), popliteal

Initial Diagnostic Testing

Check ABI with handheld Doppler

If elderly/diabetic ⟶ ABI may be erroneous ⟶ **Use TBI (Toe brachial index)**

- CLI likely if pedal pulses absent
- Duplex: limited use unless angiography not feasible
- Specialist centers: IVUS if standard angiograms not possible

Decide Management Strategy

Is ABI ≥ 0.6–0.7 and symptoms mild OR severe systemic disease?
⟶ Conservative therapy

- Medications: Rivaroxaban 2.5 mg BID + Aspirin 75 mg + Cilostazol 50–100 mg + high-dose statin
- Encourage walking, exercises
- Diabetic foot evaluation; avoid barefoot walking

Else (ABI < 0.6, rest pain, ulcers, gangrene, severe claudication)
⟶ Revascularization indicated

Choose Revascularization Method

- **Endovascular (Angioplasty):**
  - Usually via contralateral groin
  - Use Drug-Coated Balloons (DCB) to reduce restenosis
  - Avoid stents except in external iliac artery or complications (e.g., dissection)

Surgical Bypass:

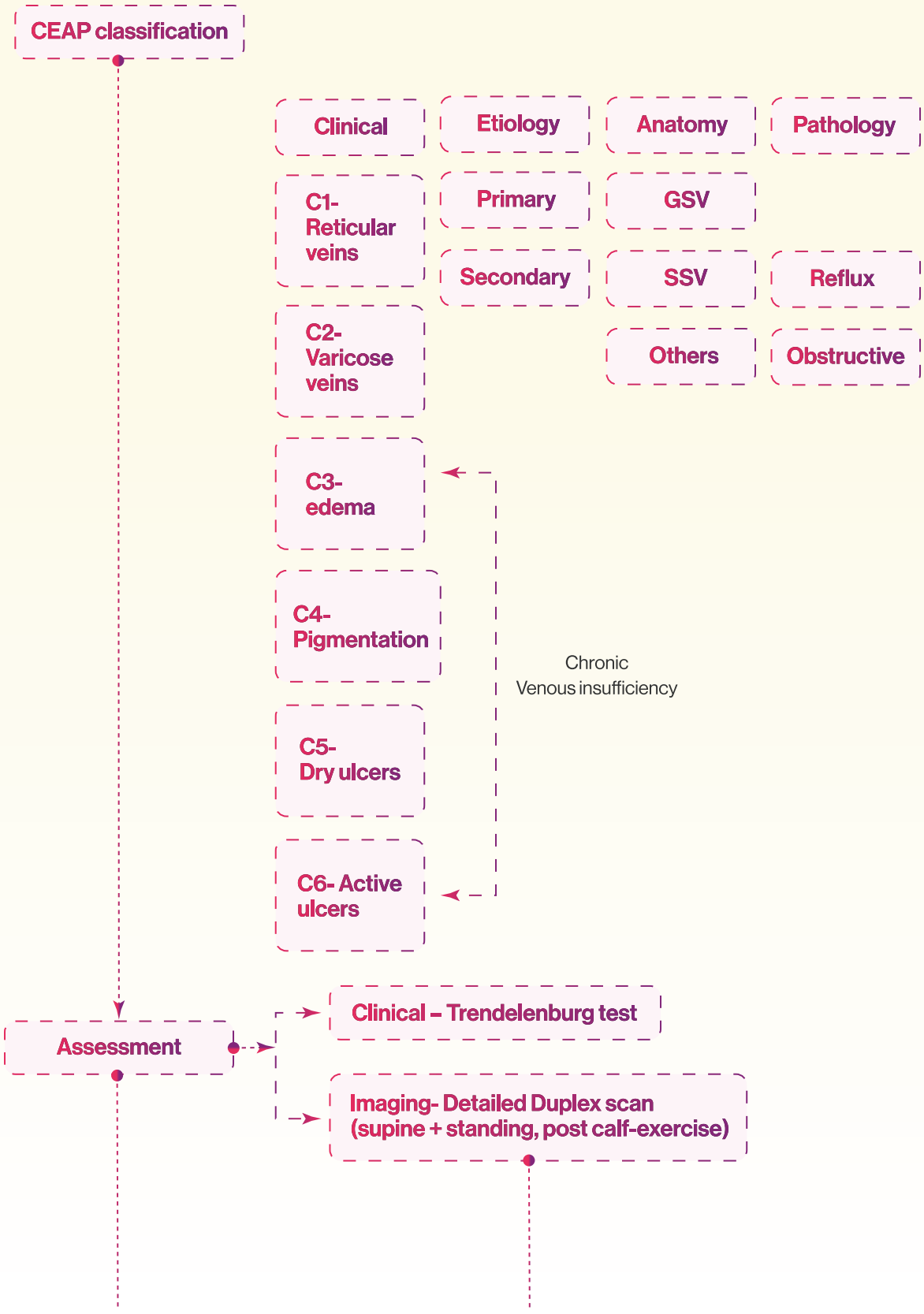
- Below knee ⟶ autogenous vein
- Femoro-popliteal ⟶ vein or ePTFE graft
- Supra-inguinal (e.g., aorto-bifemoral, axillo-bifemoral) ⟶ ring-reinforced grafts

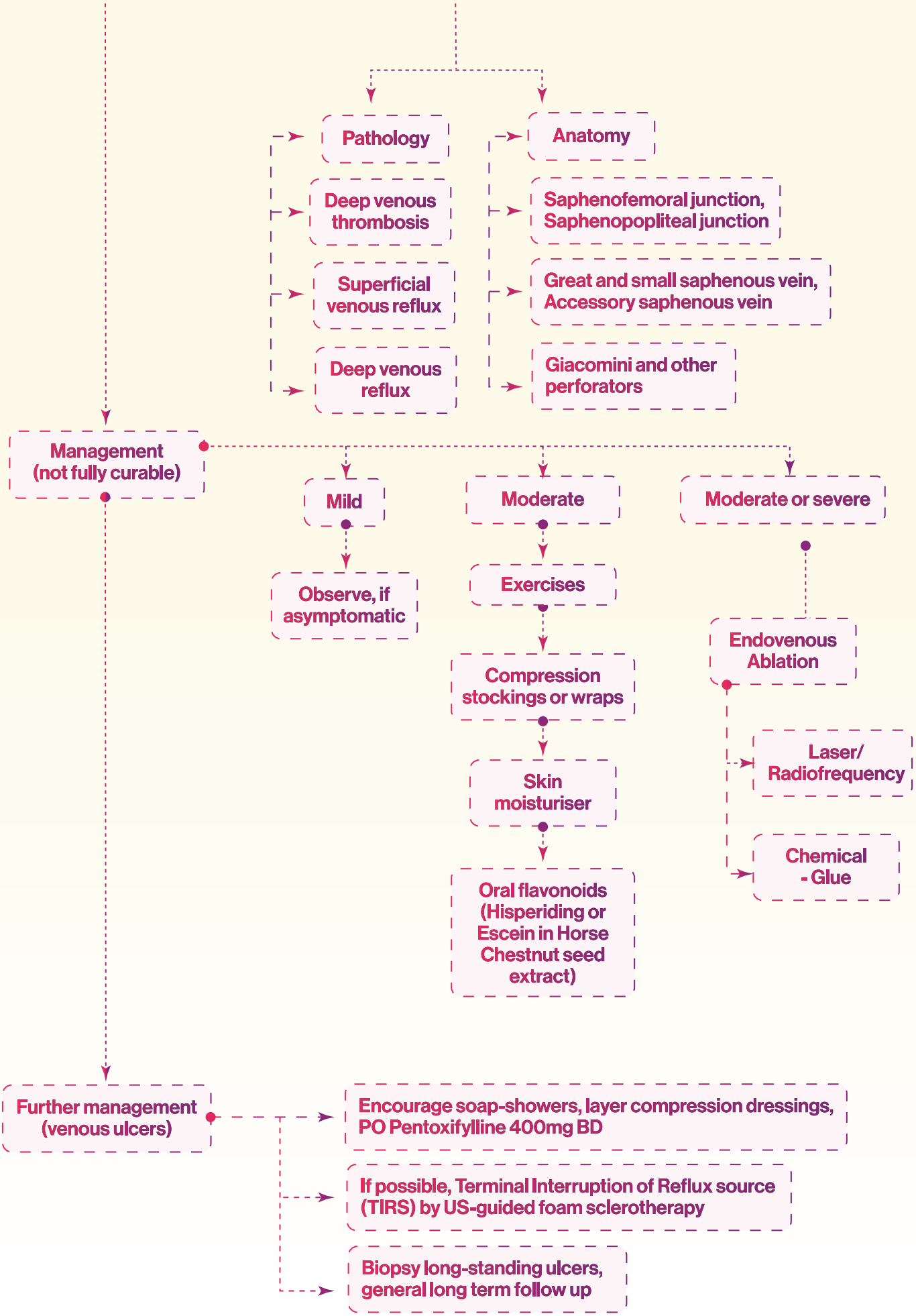
Post-Procedure Care

- Continue antiplatelet + adjunct medications
  - Provide fungal prophylaxis (important for procedures involving grafts/stents

VARICOSE VEINS AND CHRONIC VENOUS INSUFFIENCY

Dr. Krishnendu Mukherjee




Pathology
Deep venous thrombosis
Superficial venous reflux
Deep venous reflux
Anatomy
Saphenofemoral junction, Saphenopopliteal junction
Great and small saphenous vein, Accessory saphenous vein
Giacomini and other perforators
Management (not fully curable)
Mild
Observe, if asymptomatic
Moderate
Exercises
Compression stockings or wraps
Skin moisturiser
Oral flavonoids (Hisperiding or Escein in Horse Chestnut seed extract)
Moderate or severe
Endovenous Ablation
Laser/ Radiofrequency
Chemical - Glue
Further management (venous ulcers)
Encourage soap-showers, layer compression dressings, PO Pentoxifylline 400mg BD
If possible, Terminal Interruption of Reflux source (TIRS) by US-guided foam sclerotherapy
Biopsy long-standing ulcers, general long term follow up

DEEP VEIN THROMBOSIS

Dr Krishnendu Mukherjee

Prophylaxis should be considered for every bed-ridden patient.

Surgical Risk Factors

- Any operation under GA over 60 minutes
- Abdominal/pelvic operations
- Hip & knee operations

Pharmaco-prophylaxis

- LMWH,UFH,Fondaparinux
- Use one molecule and gain experience with it eg Enoxaparin 40-60mg Inj Subcut

Patient related risk factors

HIGH RISK

- Prior h/o DVT or family history
- Malignancy
- Stroke
- Any degree of HF
- COPD

MODERATE RISK

- Age,
- Obesity
- Varicose Veins
- OCP
- Pregnancy

Mechanical prophylaxis

Effective but less than Pharmaco-prophylaxis

- Pneumatic Compression Device (PCD),
- Calf-pumps
- Elastic Compression Stockings, (ECS),PCD is superior

If in doubt, at least use a PCD; if not available,use an ECS.

BUT, DVT Prophylaxis must be a part of the check list. Prophylaxis should begin before the induction of Anesthesia, if GA is used.

DIAGNOSIS & TREATMENT (OPD)

Swollen leg. Pain may be absent. Unlike Cellulitis, limb is not warm.

USG WITH DOPPLER

Infra Inguinal — Check if provoked or unprovoked? — **Supra inguinal.**

Infra-inguinal minimally symptomatic DVT can be managed as an out-patient.
Oral DOACs eg Rivaroxaban 30mg daily
Basic screen of malignancy if unprovoked,
Routine blood tests with P-time, D-Dimer.
Specialist referral

Supra-inguinal DVT or very symptomatic with massive swelling, color change or blisters
Hospitalise, bolus I/V UFH 10,000 U and infusion eg 500 U/hr, monitor APTT 6 hrly OR oral DOAC
Urgent specialist referral
Baseline ABG, CXR, ECG, ECHO.

IPD Diagnosis & Treatment

- In the in-patient or post-operative setting DVT can be notoriously silent.
- D-Dimer does not help in diagnosis.
- Maintain high index of suspicion
- Low grade fever, unexplained tachycardia, short spelling of breathlessness.
- Duplex imaging is the preferred method though small calf clots may be missed, but these do not usually caused fatal VTE.

Ask - Can we anti-coagulate?

- Yes : Start Heparin as above & follow the Supra-inguinal protocol
- No : Arrange for Retrievable IVC Filter; remove in 4-6 weeks.

INITIAL ASSESSMENT OF POLYTRAUMA PATIENT

Dr. Shamita Chatterjee

Preparation
Primary Survey
Resuscitation Adjuncts
Reevaluation

→

Detailed Secondary Survey
Reevaluation
Adjuncts

→

Reevaluation
Definitive Care

Primary Survey

Airway with c-spine protection
Breathing and ventilation
Circulation with hemorrhage control
Disability: Neurological status
Exposure / Environmental control

Quick Assessment in 10 Seconds

Ask the patient his or her name

Ask the patient what happened

Appropriate Response Confirms

A Patent airway
B Sufficient air reserve to permit speech
C Sufficient perfusion
D Clear sensorium

A

Start high flow (10-15l/min) supplemental oxygen through mask

Attach monitors

Open mouth to look for obstruction (secretions, blood, foreign body, broken teeth / dentures etc.)

Suction, if necessary

Decision as to whether to intervene

A

Chin lift, Jaw thrust, No head tilt

Inline immobilisation of cervical spine

Adjuncts –

OPA (Do not use in patient with intact gag reflex)

NPA (Do not use in midface #, suspected basilar skull #)

A When to intervene?

Impending airway compromise (Airway problem)

Need for ventilation (Breathing problem)

Inability to protect the airway (Disability problem)

S&S of Airway Compromise

Noisy breathing
Change in voice / hoarseness
Agitation (hypoxia) or Obtundation (hypercarbia)
Dyspnea, retractions and use of accessory muscles
Abnormal breathing pattern
Tachypnea
Low oxygen saturation (late sign)
Cyanosis (hypoxia)

Definitive Airway

Definition

A tube placed in the trachea

Cuff inflated below the vocal cords

Tube connected to some form of oxygen-enriched source

Airway secured in place with tape

Definitive Airway

Examples

Endotracheal airway

Surgical cricothyroidotomy

Tracheostomy

(LMA is a supraglottic airway and not a definitive airway)

B

Assess and ensure adequate oxygenation and ventilation

Check –
Respiratory rate
Asymmetrical chest wall movements
Decreased / absent breath sounds
Oxygen saturation

Ref: Chest Trauma algorithm for assessment

C

Assess for organ perfusion

Level of consciousness

Skin color and temperature

Pulse rate and character

C

2 large bore canula >18G

Warm, isotonic fluid - RL / NS – 1l

Reassess and decide on further fluid

Early blood requisition

Monitor urine output

NO colloids / vasopressors in acute setting

C
Hemorrhage from?

1 on the floor (External) → Ca

4 more – Thoracic cavity →

Ref: Chest Trauma algorithm

Abdominal cavity →

Ref: Abdominal trauma algorithm

Pelvis → Pelvic binder

Long bones — Splint

Ca
Hemorrhage control

Pressure

Pack

Tourniquet (note time of application)

Pelvic binder

EFAST

D

Baseline neurologic evaluation

Glasgow Coma Scale score

If GCS<8, secure the airway

Observe for neurologic deterioration

Pupillary response

Intoxication – don't get biased

Ref: Head Trauma Initial Management Algorithm

E

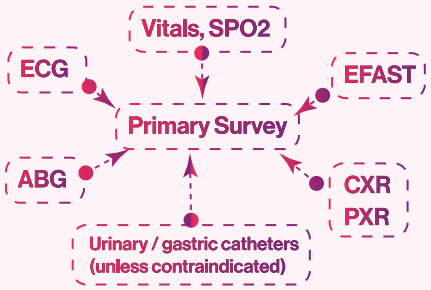
Completely undress the patient

Prevent hypothermia

Logroll if necessary

Look for missed injuries

Adjuncts to Primary Survey



Secondary Survey

When?

After -

Primary survey is completed

ABCDEs are reassessed

Vital functions are returning to normal

Components of Secondary Survey

History

Physical exam: Head to toe, front to back

Complete neurologic exam

Special diagnostic tests

Reevaluation

Transfer
When should the transfer occur?

As soon as possible after stabilizing measures are completed

Airway and ventilatory control

Hemorrhage control

Don't delay transfer for additional investigations.

Before Transfer don't forget

Analgesia with careful patient monitoring

Antibiotic

Tetanus prophylaxis

Provide copies of investigations done

Documentation

CHEST TRAUMA

Dr Shamita Chatterjee

Patient of Trauma

- Initial assessment & resuscitation as per ATLS protocol
- If history is suggestive of blunt or penetrating chest trauma
- Clinical examination

LOOK

Neck

- Raised IJV → ? Tension Pneumothorax ? Cardiac Tamponade
- Tracheal shift → ? Tension Pneumothorax ? Massive Hemothorax
- External injury Bruises Haematoma

Chest

- Increased work of breathing → ? Pneumothorax ? Haemothorax
- Abnormal / unequal chest wall movement
- External injuries – Abrasions, Bruises Haematoma Sucking wound → ? Open Pneumothorax ? Hemothorax
- Circumferential burns to chest or abdomen → May lead to ventilatory compromise

LISTEN

Chest

- Absent / decreased breath sounds → ? Pneumothorax ? Haemothorax
- Percussion
  - Hyper-resonant → Pneumothorax
  - Dull → Haemothorax
- Cardiac sounds → If absent / muffled → Cardiac tamponade (associated with ↑ IJV)

F E E L

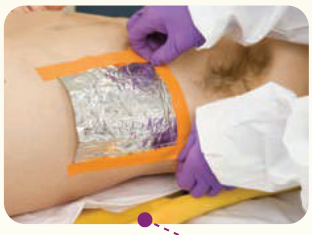
- **Neck & Chest**
  - Position of trachea → Deviated → ? Tension Pneumothorax / ? Massive Haemothorax
  - Subcutaneous emphysema
  - Bony crepitus → Rib #

Investigations

- Chest Xray
- EFAST

TENSION PNEUMOTHORAX IS A CLINICAL DIAGNOSIS.
INVESTIGATIONS WILL LEAD TO WASTAGE OF TIME.
MAY COST THE PATIENT HIS LIFE.

- **Pneumothorax**
  - Open Pneumothorax → 3way dressing
  - Simple Pneumothorax
  - Tension Pneumothorax → Needle thoracocentesis
- **Haemothorax**
  - Simple Haemothorax
  - Massive Haemothorax



Intercostal drain insertion

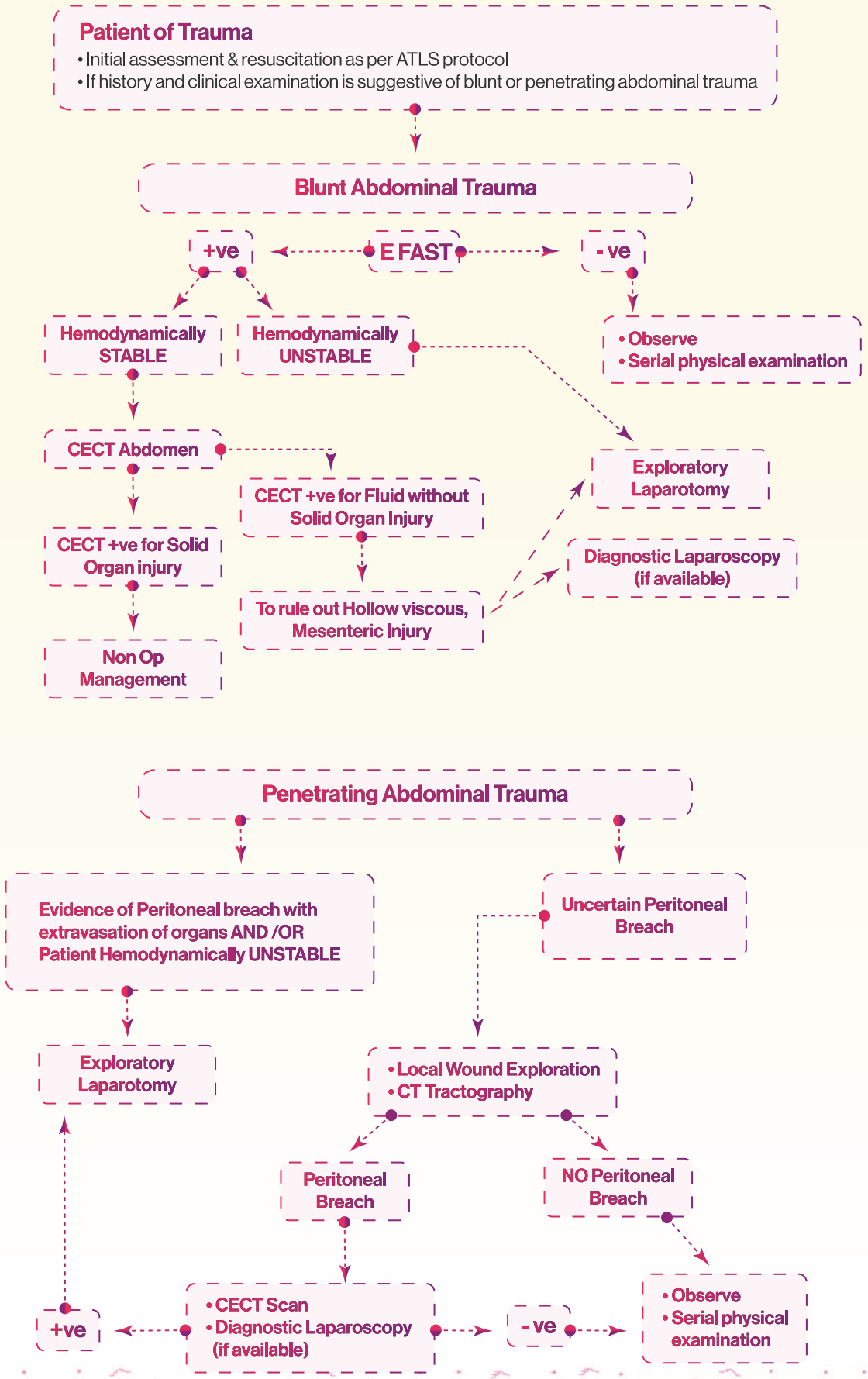
Thoracotomy –
ICD > 1500 ml stat
ICD > 200 ml/hr - 3-4 hrs

Chest trauma

- Significant cause of mortality.
- Many of these deaths can be prevented with prompt diagnosis and simple interventions.
- <10% of blunt chest injuries require operative intervention.
- Only 15% to 30% of penetrating chest injuries require operative intervention.
- An intercostal drain insertion may be the only thoracic intervention required to prevent these mortalities.

ABDOMINAL TRAUMA

Dr Shamita Chatterjee



HEAD TRAUMA - INITIAL MANAGEMENT OUTLINE

Dr Shamita Chatterjee

PATIENT OF TRAUMA

Initial assessment & resuscitation as per ATLS protocol

If mechanism of injury and clinical examination is suggestive of head trauma

→ Primary brain injury has already occurred.

Goal of treatment - Avoid secondary brain injury

Avoid hypoxia
Avoid hypotension

Neurosurgical opinion / referra

Airway & Breathing
(to prevent hypoxia)
- 10-15L/min O_2
- SPO2 > 98% desirable
- GCS<8 → Secure airway

Clinical evaluation
- GCS
- Pupils
- Evidence of base of skull fracture

Circulation
(to prevent hypotension)
- **Fluids**
  - Isotonic (RL/NS)
  - Avoid 5% Dextrose / DNS
- **Target Systolic BP**
  - Age 50-69 >100 mm Hg
  - Age 15-49 or >70years - >110mm Hg

* Rule out hypotension due to other sources of haemorrhage (Chest, abdomen, pelvis, long bones, external bleeding).

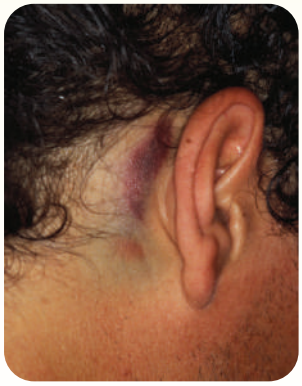
* Brain injury Itself usually does not cause hypotension.

Base of skull fracture
- Otorrhoea, Rhinorrhoea (Blood / CSF)
- Racoon eyes
- Battle sign

*Avoid Ryles tube in presence of base of skull fracture.

Severity of Head Trauma	GCS Score
Mild	13–15
Moderate	9–12
Severe	3–8

Racoon eyes



Battle sign

Glasgow Coma Scale

Scale	Score
Eye Opening (E)	
Spontaneous	4
To sound	3
To pressure	2
None	1
Nontestable	NT
Verbal Response (V)	
Oriented	5
Confused	4
Words	3
Sounds	2
None	1
Nontestable	NT
Best Motor Response (M)	
Obeys commands	6
Localizing	5
Normal flexion	4
Abnormal flexion	3
Extension	2
None	1
Nontestable	NT

Medications

- **Mannitol**
  - Only after ruling out EDH
  - Do not give mannitol in patients with hypotension
- **Antiseizure**
  - Indication -Depressed skull fracture, SDH, EDH, Intracerebral haemorrhage, seizure within 24hrs of injury
  - Prophylaxis - if GCS<8 and penetrating TBI
- **Avoid long-acting paralytic agents**

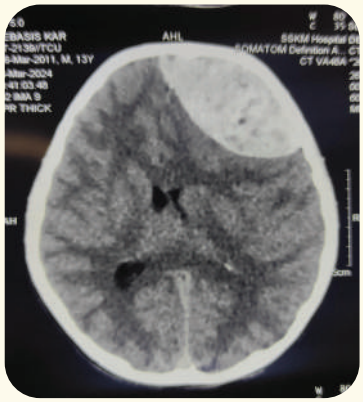
NCCT Scan of Brain

(Not indicated for all head trauma patients)

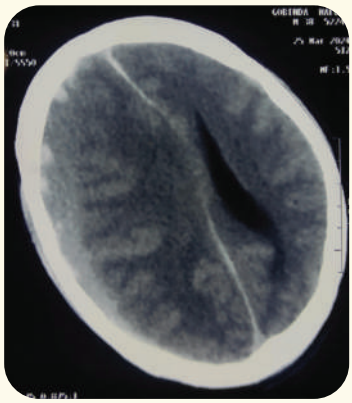
Indications

- All moderate and severe head trauma patient
- Mild head trauma patient with GCS score < 15 even after two hours of injury
- Vomiting (> 2 episodes)
- Signs of base of skull fracture
- Open skull fracture
- Neurological deficit
- Extremes of age
- Retrograde amnesia
- Severe headache

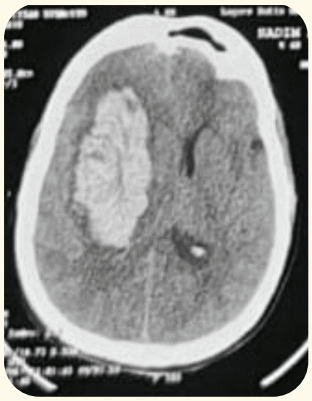
Neurosurgical opinion / referra



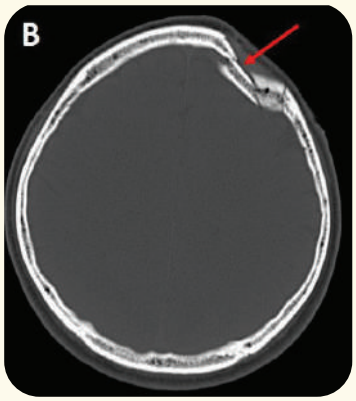
Extradural haematoma



Subdural haematoma with midline shift



Intraparenchymal bleed



Depressed skull fracture

MALDESCENDED TESTIS

Dr Sukumar Maiti

Mal-descended Testis may be

- **Cryptorchidism (Undescended)** testis arrested along normal line of descent.

- **Ectopic Testis:** arrested outside line of normal descent. Testis crossed through superficial inguinal ring and followed the course of hoods of gubernaculum to sites other than the ipsilateral scrotum

Cryptorchidism (Undescended Testis)

- Unilateral Rt 57%, Lt 44%%, Bilateral 12%
- Palpable/Impalpable
- Associated clinical hernia 65%

Undescended Testis needs treatment

to avoid Complications – torsion, tumour, atrophy & infertility

Ask parents to ensure whether it is a

1. True Cryptorchism (Hidden Testis) - the testis is not found since birth or
2. Blighted (Lost) Testis - testis was there in scrotum at birth but disappeared after an acute event (Pain, swelling, redness) which is suggestive of torsion testis.

Records during Examination

1.Scrotum is poorly developed on the affected side when associated with cryptorchism

2.If Scrotum on the affected side looks normal as on the normally descended side, blighted testis may be suspected.

3.Expansile impulse on crying at groin indicates hernia associated with undescended testis.

4.Testis may be

(a) **Palpable** within the inguinal canal

(b) **Impalpable** – testis is not palpable elsewhere

(c) **Retractile** – test is palpable at lower part of inguinal canal and can pe pulled to scrotum, where it stays for some time

(d) **Palpable outside the inguinal canal or scrotum** i.e. at ectopic sites – Superficial inguinal pouch, femoral, perineal, suprapubic region, opposite scrotal sac (crossed ectopia).

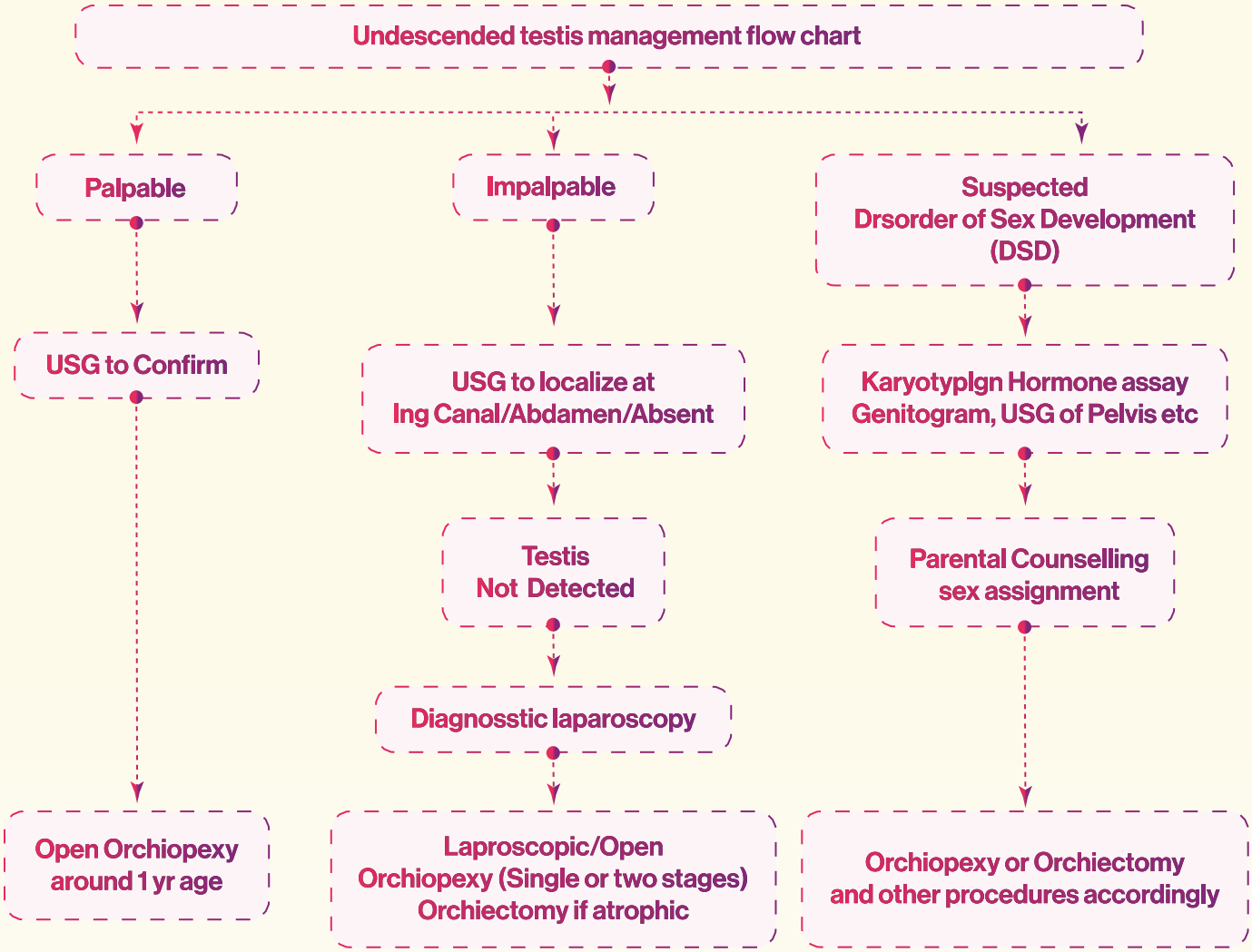
5. **Ambiguous genitalia and Disorder of Sex Development (DSD)** suspected in case of Bilateral undescended testis and unilateral undescended testis with hypospadias.

Investigations for localisation

1.ULTRASONOGRAPHY (Groins & Pelvis) – gives an idea on location of the testis and its size as well as presence of hernia

2.DIAGNOSTIC LAPAROSCOPY combining with therapeutic steps for UDT

3.SPECIAL SITUATION WHEN DSD SUSPECTED – Karyotyping for sex chromosomes, Hormonal assays (Testosterone, LH, FSH), Genitogram, USG of pelvis for any presence of Mullerian system (Uterus/Ovary etc.)



Timing of operation – Guiding Principle

1. Diagnosis made at birth, reconfirmed at 6 months. Orchiopexy planned between 6 months – 12 months
2. Undescended testis with clinical inguinal hernia - needs early surgery before waiting for 6 months due to the risk of obstructed hernia which may endanger the spermatic cord and the testis
3. Undescended Testis with late presentation in adult-options are Orchiectomy/Orchidopexy if done, regular follow up examination of the testis is needed to detect malignancy if any.

Some Remembrances

1. Operation should be undertaken at a centre with paediatric surgery and paediatric anaesthesia facilities are present
2. Procesus vaginalis remains patent with all cases of inguinal undescended testis
3. For Ectopic Testis - Orchiopexy within scrotum is easier because of long length of the spermatic cord.
4. Retractile testis needs consideration for operation around 7yrs if it is not stable within scrotum.

TESTICULAR PAIN

Dr Debanshu Sarkar, Dr Krishnendu Maiti, Dr Souvik Chatterjee

Step 1- Presentation

Patient with acute onset scrotal or testicular pain +/- swelling

Step 2 – Initial assessment

- Assess vitals ⟶ rule out systemic illness or sepsis

Obtain focused history:

- Onset (<5hours ⟶ torsion likely)
- Associated symptoms (nausea/vomiting ⟶ torsion)
- Urinary symptoms (dysuria ⟶ Epididymitis)
- History of trauma, sexual activity, or systemic disease

Step 3- Physical examination

- Inspect scrotum for swelling, erythema, abnormal testicular position

Palpate testis and epididymis:

- Diffuse testicular tenderness ⟶ Torsion
- Localised epididymal tenderness ⟶ Epididymitis
- Tender superior-pole nodule ⟶ Torsion of appendix testis
- Assess cremasteric reflex (absent ⟶ Torsion; present ⟶ Epididymitis)
- Check Prehn's sign (pain not relieved in torsion, relieved in epididymitis)
- Examine for inguinal hernia or trauma

Step 4 – Investigations (of diagnosis uncertain)

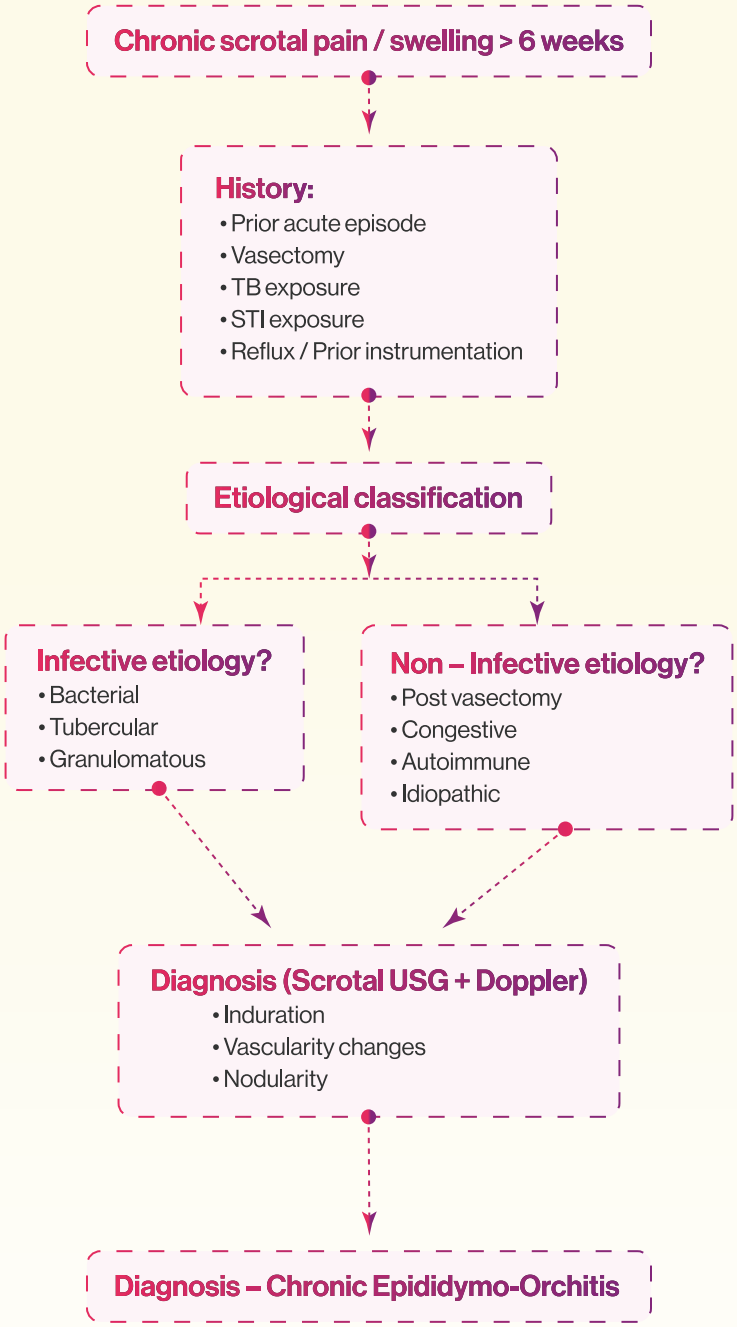
- Colour Doppler ultrasonography (to assess blood flow)
- Urinalysis (Pyuria ⟶ epididymitis)
- CBC/CRP (infection markers)

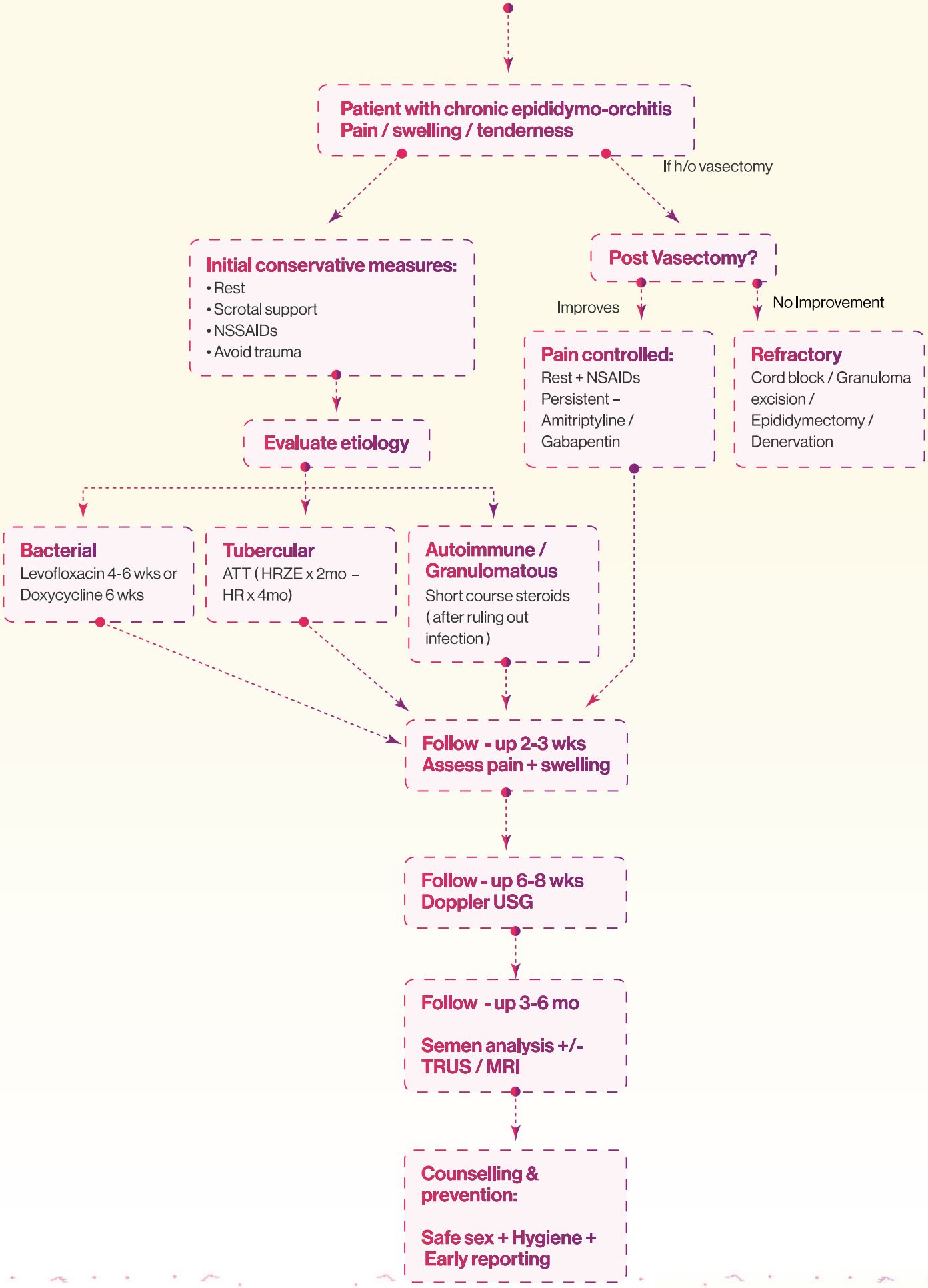
Step 5 – Management according to diagnosis

- If torsion stronglt suspected ⟶ DO NOT DELAY IMAGING ⟶ Immediate surgical exploration
- If epididymitis suspected ⟶ Empirical antibiotics, scrotal support, analgesics
- If torsion of appendix testis ⟶ Conservative management with analgesics

CHRONIC EPIDIDYMO-ORCHITIS

Dr Debanshu Sarkar, Dr Krishnendu Maiti, Dr Souvik Chatterjee

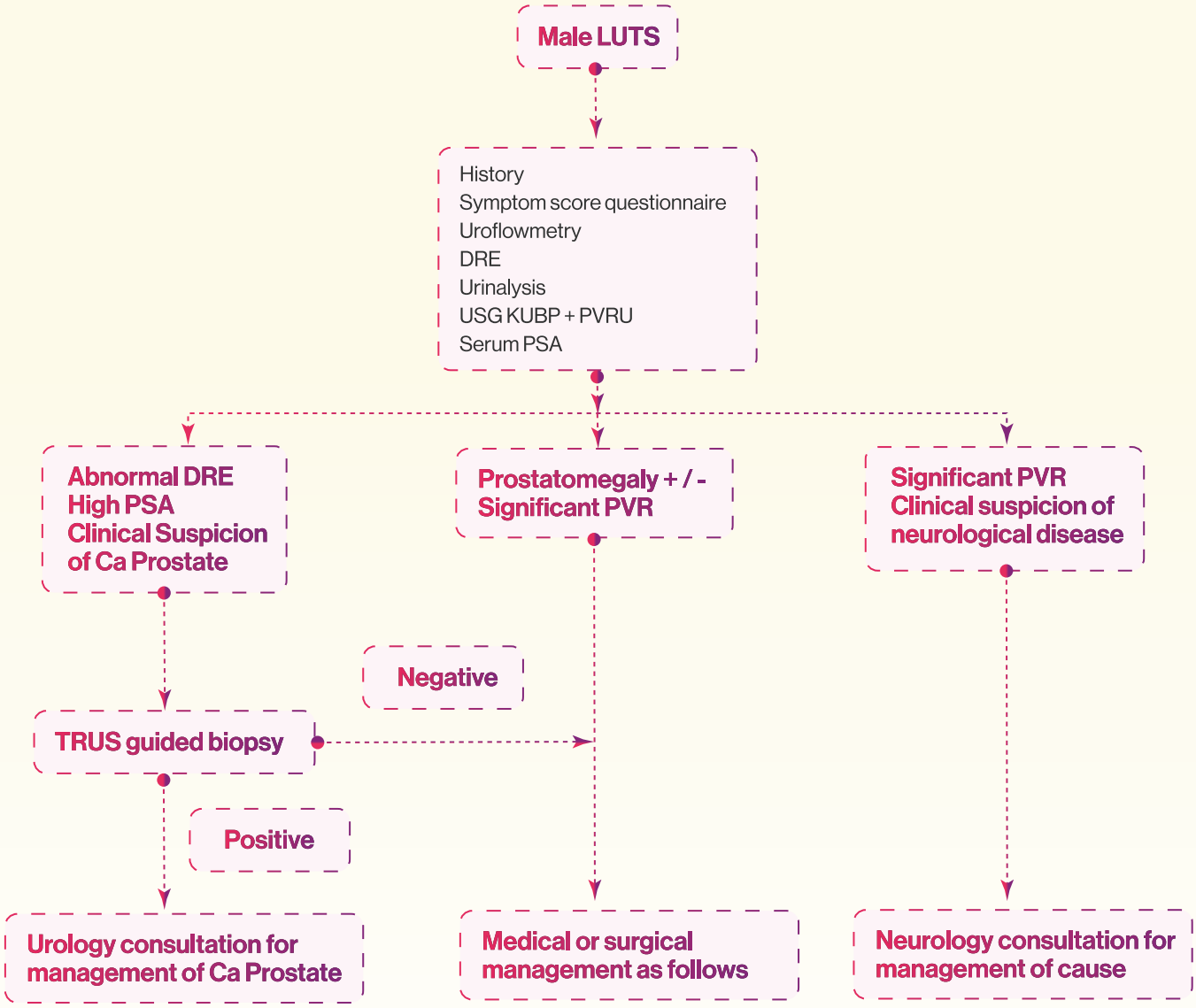



Patient with chronic epididymo-orchitis
Pain / swelling / tenderness
If h/o vasectomy
Initial conservative measures:
• Rest
• Scrotal support
• NSSAIDs
• Avoid trauma
Post Vasectomy?
Improves
No Improvement
Pain controlled:
Rest + NSAIDs
Persistent –
Amitriptyline /
Gabapentin
Refractory
Cord block / Granuloma excision /
Epididymectomy /
Denervation
Evaluate etiology
Bacterial
Levofloxacin 4-6 wks or
Doxycycline 6 wks
Tubercular
ATT (HRZE x 2mo –
HR x 4mo)
Autoimmune / Granulomatous
Short course steroids
(after ruling out
infection)
Follow - up 2-3 wks
Assess pain + swelling
Follow - up 6-8 wks
Doppler USG
Follow - up 3-6 mo
Semen analysis +/-
TRUS / MRI
Counselling &
prevention:
Safe sex + Hygiene +
Early reporting

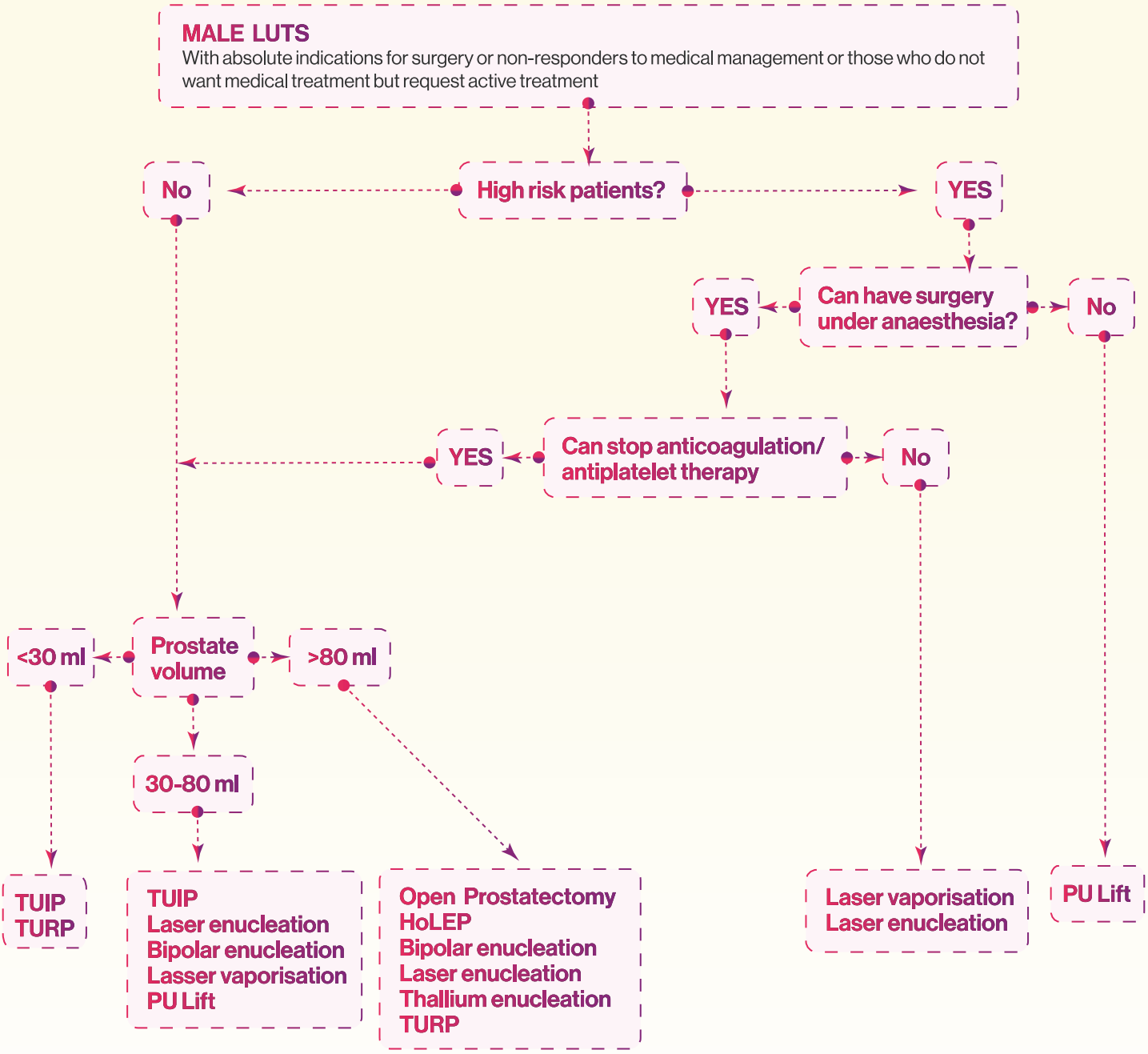
APPROACH TO MALE LUTS AND PROSTATOMEGALY

Dr Debanshu Sarkar, Dr Krishnendu Maiti, Dr Souvik Chatterjee

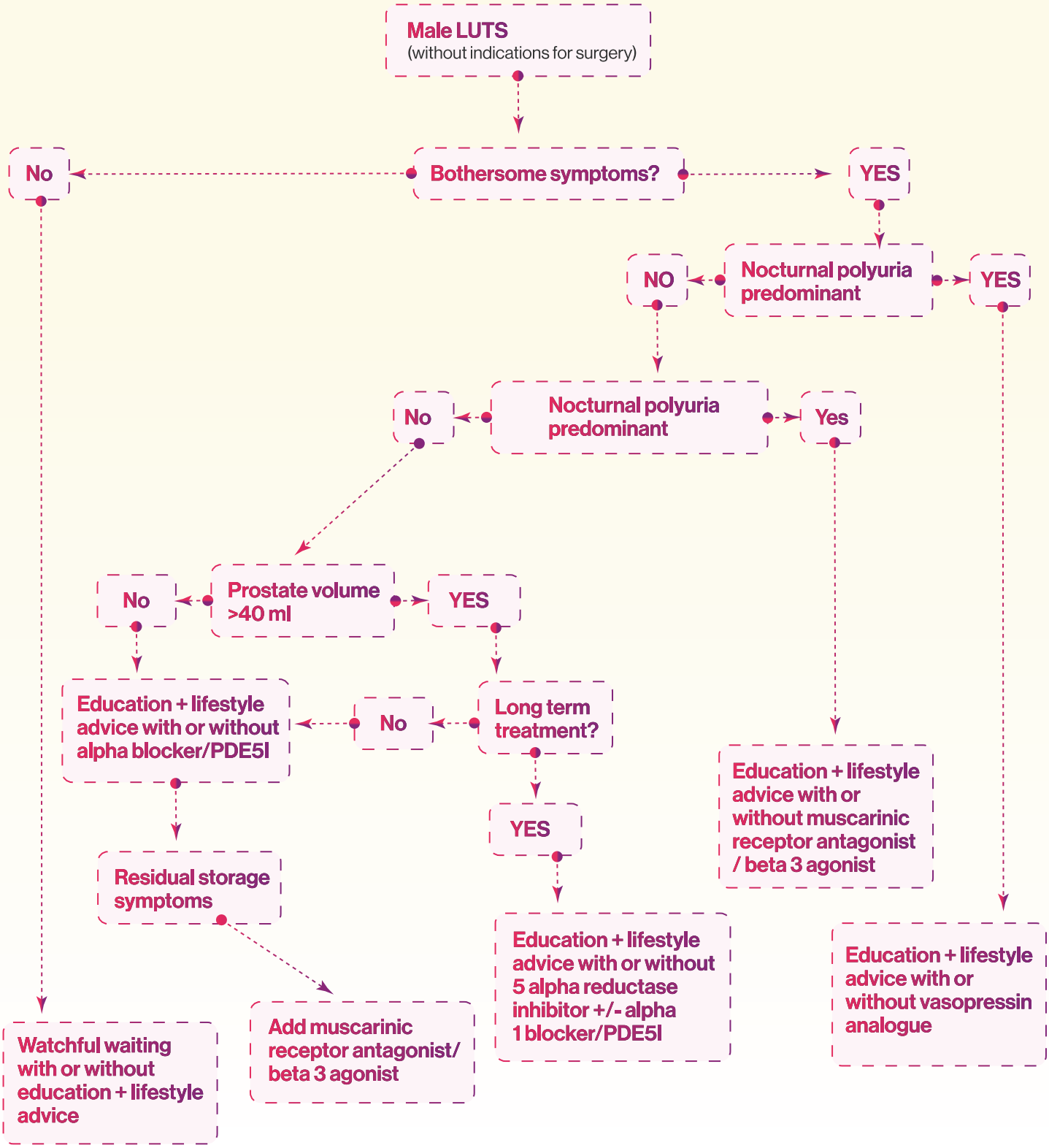
ASSESSMENT



SURGICAL MANAGEMENT



MEDICAL MANAGEMENT



RENAL CELL CARCINOMA

Dr Debanshu Sarkar, Dr Krishnendu Maiti, Dr Souvik Chatterjee

History

- Patients may present incidentally during imaging for other causes or with symptomatic disease (e.g., flank pain, hematuria, palpable mass)
- Systemic symptoms such as fever, weight loss, fatigue, or paraneoplastic manifestations (e.g., anemia, hypercalcemia) may also occur.

Diagnosis

Laboratory Investigations

- CBC - to assess for anemia or polycythemia
- KFT, LFT, BUN/Creatinine - to evaluate renal and hepatic function
- LDH - used as a prognostic marker
- Urinalysis - may show microscopic or gross hematuria

Imaging Studies

- **CECT KUB**- Primary imaging modaility
  - Diagnostic clue: >15 Hounsfield Unit (HU) with early wash out of contrast in solid renal tumour before and after contrast administration (if Cr <1.5)
- **MRI KUB/ Multiparametric MRI (mpMRI)**
  - Provides clue for complex renal cysts. May be done in deranged KFT
  - provides **Clear Cell Likelihood Score (ccS)** – useful for predicting clear cell RCC in cT1 lesions

Metastatic Work-Up

- HRCT Thorax - for lung metastasis evaluation
- CECT Whole Abdomen & Pelvis - for local extension or visceral metastases
- FDG PET/CT- optional; low sensitivity and specificity, hence not routinely recommended

RENAL CELL CARCINOMA

CECT KUB

TREATMENT

T1a (<4cm)

Confined to the kidney
- Partial Nephrectomy (PN) preferred
- Alternative: Thermal Ablation (in selected)

T1b (4-7 cm)

Confined to kidney
- Partial Nephrectomy (PN) if technically feasible, otherwise Radical Nephrectomy

T2 (>7cm)

Confined to kidney
- Metastatic Workup, as shown earlier
- Radical Nephecrtomy

T3/T4/N+/M0

Locally Advanced
Metastatic Workup, as shown earlier

- Radical Nephrectomy
- + Thrombectomy (if venous thrombus)
- IVC reconstruction, if required
- +/- Adrenalectomy
- Selective LN dissection, if nodes are clinically enlarged

ADJUVANT THERAPY

HIGH RISK RCC

As per KEYNOTE 564 trial
- pT2G4
- pT3-4
- N+ disease

Adjuvant Pembrolizumab within 12-16 weeks post- surgery

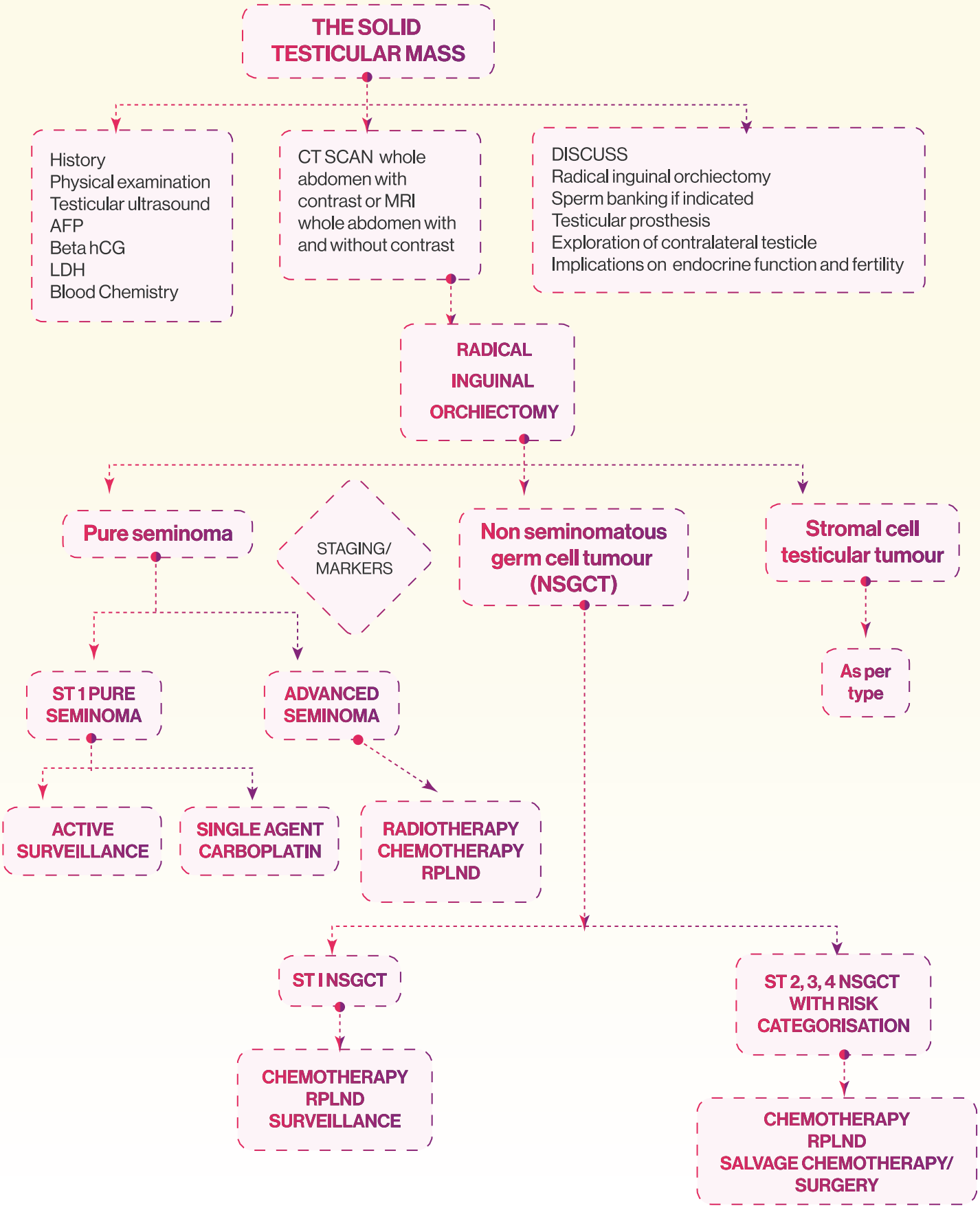
METASTATIC RCC

IMDC Risk stratification
- Favourable (limited metastatic burden, good performance status)- Cytoreductive Nephrectomy (CN)
- Intermediate- initial systemic therapy, if responding, consider delayed CN
- Poor Risk- Systemic Therapy

SYSTEMIC THERAPY
- TKi with ICI
  eg.Pembrolizumab + Axetinib or Nivolumab + Cabozanatinib
- Dual IO
  eg. Nivolumab + Epilimumab

TESTICULAR TUMOUR

Dr Kalyan Sarkar



PENILE LESION

Dr Kalyan Kumar Sarkar

A SUSPICIOUS PENILE LESION

1. INITIAL EVALUATION

- **History & Physical Examination**
  - Lesion assessment (size, site, ulceration, fixation)
  - Palpate inguinal nodes (mobile vs. fixed, unilateral/bilateral)
- **Biopsy of primary lesion**
  - Incisional or excisional biopsy for histologic diagnosis
- **Pathology:**
  - SCC type and grade (well, moderate, poor)
  - Depth of invasion
  - Lymphovascular invasion (LVI)
- **Staging workup**
  - MRI pelvis/penis for local extent
  - CT abdomen/pelvis ± chest for nodal/metastatic disease

2. TUMOR STAGING (AJCC 8th Edition)

Tis
Carcinoma in situ (PeIN)
T1a
Invades subepithelial tissue, no LVI, not high grade
T1b
Invades subepithelial tissue, with LVI or high grade
T2
Invades corpus spongiosum
T3
Invades corpus cavernosum
T4
Invades adjacent structures (prostate, scrotum, etc.)

3. MANAGEMENT OF PRIMARY TUMOR

Stage & Recommended Local Treatment

Tis / Ta / T1a
Organ-preserving therapy:
- Topical 5-FU or imiquimod (for PeIN)
- Laser ablation (CO_2, Nd:YAG)
- Wide local excision with reconstruction
- Glansectomy for localized lesions

T1b / T2 (glans or distal shaft)
- Partial penectomy with ≥1–2 cm margin
- Consider glansectomy for glans-confined

T2
- Organ-preserving if negative deep margins

T3 / T4
- Total penectomy ± perineal urethrostomy
- For locally advanced: consider neoadjuvant chemotherapy before surgery

4 & 5MANAGEMENT OF INGUINAL AND PELVIC LYMPH NODES

4A. MANAGEMENT OF INGUINAL LYMPH NODES CLINICALLY NODE-NEGATIVE

A. Clinically Node-Negative (cN0)

Risk stratify based on primary tumor:
- Low risk: Tis, Ta, T1a (G1–2, no LVI) → Surveillance
- Intermediate/High risk: ≥T1b or LVI/grade 3 → Invasive nodal staging

Nodal staging options:
- Dynamic sentinel node biopsy (DSNB)
- Modified inguinal lymph node dissection (ILND)

4B. MANAGEMENT OF INGUINAL LYMPH NODES CLINICALLY NODE-POSITIVE

B. Clinically Node-Positive (cN1–3)

Mobile unilateral node (cN1):
- Radical ILND on involved side
- Contralateral DSNB or modified ILND

Bilateral or fixed nodes (cN2–3):
- Neoadjuvant chemotherapy (TIP regimen: paclitaxel + ifosfamide + cisplatin, 4 cycles)
- If response → Bilateral radical ILND ± pelvic dissection
- If no response → Palliative systemic therapy or radiotherapy

5. MANAGEMENT OF PELVIC LYMPH NODES

Perform pelvic lymph node dissection if:
- ≥2 positive inguinal nodes on one side
- Extracapsular spread
- Large fixed nodes after chemo response

6. SYSTEMIC THERAPY

- **Neoadjuvant** (bulky N2–3)
- TIP (Paclitaxel, Ifosfamide, Cisplatin) × 4 cycles
- **Adjuvant** (after resection, high risk)
- Consider adjuvant chemo if extranodal extension
- **Metastatic / Recurrent**
- TIP or Cisplatin + 5-FU ± taxane Checkpoint inhibitors (PD-1 inhibitors) if PD-L1+ or MSI-H

7. FOLLOW-UP PROTOCOL

Time since treatment	Frequency	Focus
0–2 years	Every 3–6 months	Physical exam, node palpation, recurrence check
3–5 years	Every 6–12 months	Exam ± imaging if indicated

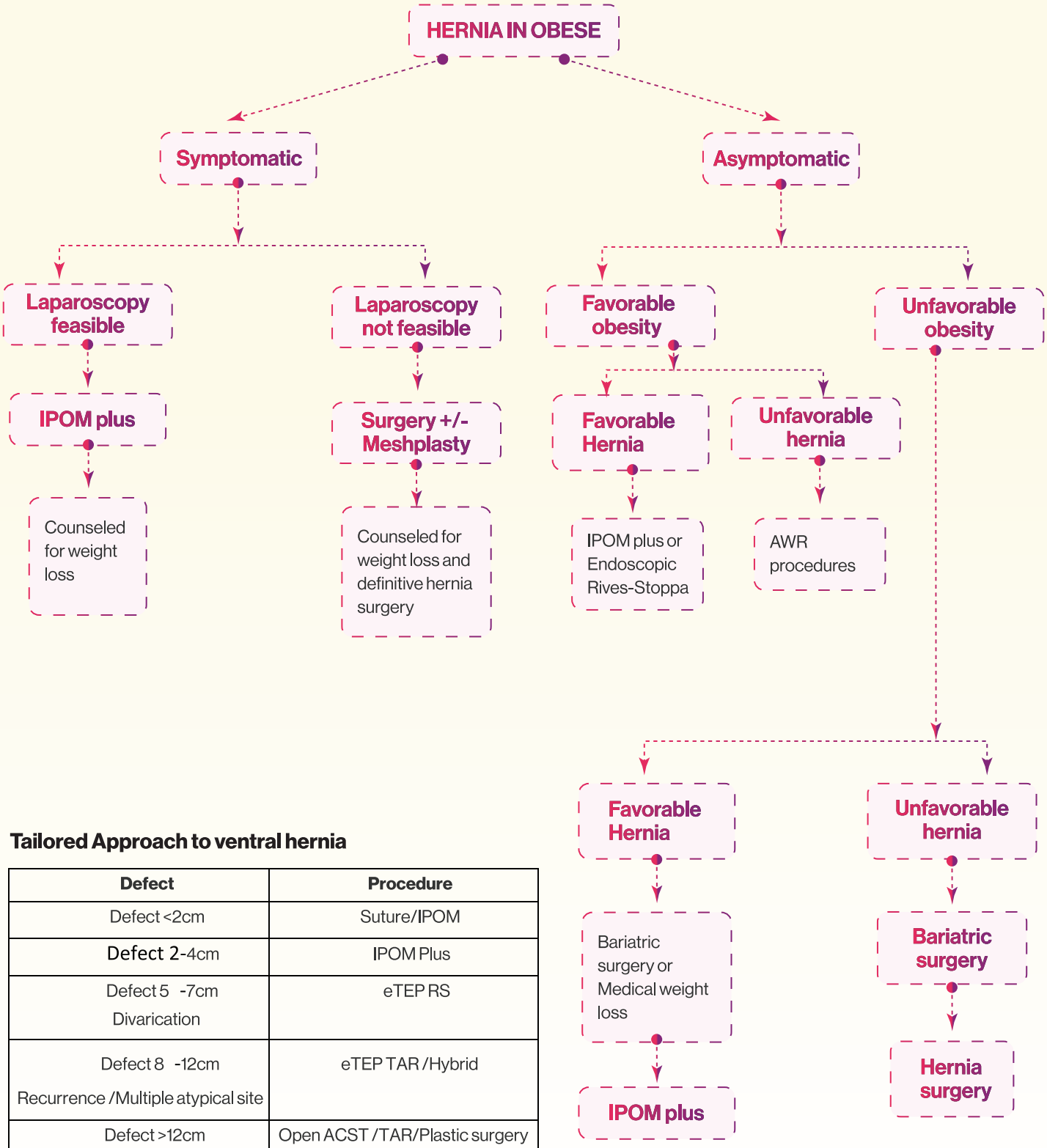
8. SUPPORTIVE & REHABILITATIVE CARE

- Psychological and sexual counseling
- Penile prosthesis or reconstruction options post-treatment
- Stoma and wound care for penectomy or urethrostomy patients

BASED ON EAU NCCN GUIDELINES 2025

VENTRAL HERNIA

Dr Sarfaraz Jalil Baig



Tailored Approach to ventral hernia

Defect	Procedure
Defect <2cm	Suture/IPOM
Defect 2-4cm	IPOM Plus
Defect 5 -7cm Divarication	eTEP RS
Defect 8 -12cm Recurrence /Multiple atypical site	eTEP TAR /Hybrid
Defect >12cm Loss of Domain Adverse room factors Previous mesh	Open ACST /TAR/Plastic surgery

GROIN HERNIA

Dr Sumanta Dey

1.Indirect
2.Direct
3.Pantaloon's
4.Femoral
5.Obturator

Diagnosis
- Clinical +/- USG
- Sometimes CT/MRI

Incarcerated Strangulated Obstructed

Yes

No

Emergency Surgery
Laparo-endoscopic repair - TAPP
Open Repair
+/- Mesh

Symptomatic

Asymptomatic

Consider watchful waiting

Elective Surgery

Primary Unilateral

Lichtenstein (Open) or Laparo-endoscopic mesh repair (TAPP/TEP)

Primary Bilateral

Laparo-endoscopic mesh repair (TAPP/TEP)

Recurrent

After Anterior (Open) approach

Laparo-endoscopic mesh repair (TAPP/TEP)

After Posterior (Laparoscopic) approach

Lichtenstein (Open) repair

ORAL CAVITY CANCERS

Dr Saurav Kumar Ghosh

Presentation:

Gross appearance – ulcer/exophytic/ulcero-proliferative/infiltrative (plaque like)
Non-healing/Pain+-/slow growing/traumatic bleeds/**indurated** base/involves skin
(advanced)/cervical lymphadenopathy/dysarthria or swallowing difficulty with tongue lesions/loose teeth.
Associated History -Tobacco use, alcohol use, pre-existing white patch, sharp tooth, dental caries,
If lesion persists **3 weeks** after correction of any obvious inciting cause, **advise biopsy** (punch/incision).

Biopsy proven squamous CA of oral mucosa: Determine T, N & M stage clinic-radiologically

Staging:

1. CECT scan of PNS & neck (Puffed cheek technique, close cuts to be taken parallel to palate)
   - I. Posteriorly situated lesions
   - II. Restricted mouth opening/
   - III. Uncooperative
   - IV. infiltrative lesions:

   For tongue lesions CEMRI better
2. USG neck: If only neck evaluation is needed: (bulky or short neck, indeterminate node)
3. For metastases: CXR – as lung is commonest site of distal mets.
   CECT scan Thorax : For T4 lesion/multiple or bulky neck nodes/lung symptoms

M-0: Treat with curative intent

M-1 disease : Palliative chemotherapy/RT

Tx of Primary T 1-4A (resectable):

Surgery is preferred treatment. 3-dimensional wide excision of primary, with 1 cm gross margins on all sides. Radical radiation is also an option

Buccal mucosa
Skin is close, may need excision. Assess pliability

Tongue
If crossing midline, temp tracheostomy. Also for lower alveolus

Lower Alveolus
If very superficial-marginal mandibulectomy, for advanced lesions-segmental resection

Lips
Up to 1/3rd of lower & 1/4th of upper lip-primary closure

Palate
Infra-structure maxillectomy

a. Primary is T4B of AJCC 8th classification
b. Tongue lesion with extensive involvement of base of tongue
c. Buccal primary with skin involvement up to zygoma
d. Lower limit of skin involvement (oedema) up to hyoid
e. RMT lesion with ITF involved above mandibular notch

→ **Unresectable**

For exophytic T1 or early T2 lesion of hard palate or lip/commissure, **Radical Radiation** may be preferred over surgery: gives equivalent oncological results (less morbid/more cosmetic).

Tx of Neck nodes: Surgery is preferred

N-0 (clinic-radiological)

↓

Primary not crossing midline –

Ipsilateral Supra-omohoid neck dissection (levels 1 to 3)

N 1, N2 and resectable N3

↓

Primary not crossing midline-

Ipsilateral MRND Type 3 if small volume disease
Ipsilateral MRND Type 2 if PMMC flap recon
Ipsilateral RND/MRND (any type) if bulky nodes involve Spinal Accessory nerve/ IJV

Unresectable N3

↓

Involves Carotid Art / Prevertebral fascia

↓

Palliative chemotherapy/RT

Adjuvant therapy after surgery (based on H/P report)

Adjuvant radiation:

T3, T4, primary
N2, N3 neck, and some N1 also.
Close margins (< than 5 mm),

Adjuvant chemo-radiation

Gross residual disease (R-2 resection)
Extra-nodal extension

Reconstruction of primary:

1. Buccal mucosa: Defect < 2 cm, primary closure. For larger defects, STSG or tongue/nasolabial flap, Free Radial artery forearm flap

2. Tongue : Very small excisions : Defect may be left raw to granulate. For 20- 40 % volume loss – primary rotational closure of remnant tongue. 50% or more loss – replacement by Free Radial or Free Antero-Lat Thigh (ALT) or Free Rectus Abdo Muscle flap (RAM) are ideal, or pedicled PMMC flap if microvascular recon not available.

3. Lower alveolus : Segmental excisions may be fixed by Titanium recon plates, or with rib grafts, or Free Fibular osteo-cutaneous flaps (ideal), especially for middle third defects of mandible. PMMC flap is a simpler and good option for recon but won't allow future dental implants.

4. Lip : Abbe or Abbe-Estlander flap, Karapandzic flap for bigger defects

Metastatic disease: Has poor outcome.

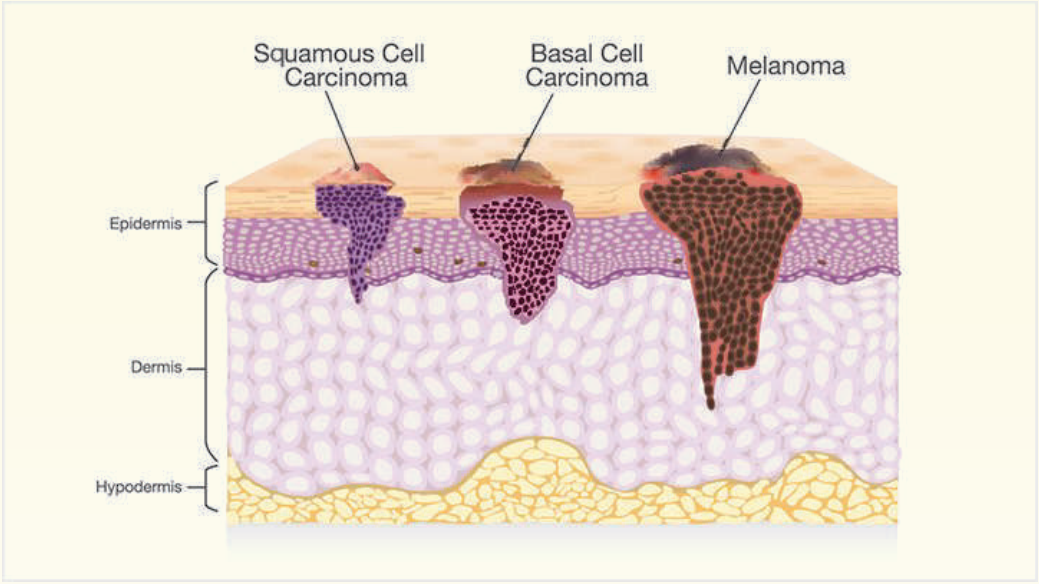
- Palliative chemotherapy +/- targeted therapy
- Palliative Radiation for pain relief/bleeding
- Tracheostomy: Relieve airway obstruction or protect airway from bleeding

SKIN TUMOURS

Dr Madhumita Mukhopadhyay

The skin is the body's largest organ. It protects against heat, sunlight, injury, and infection. Skin tumours develop as a result of proliferation of a single or multiple components of the skin. Skin tumors are classified by their origin, most commonly using the World Health Organization (WHO) system, which divides them into categories such as keratinocytic/ epidermal, melanocytic, adnexal (skin appendage), hematolymphoid, and soft tissue tumors. This classification can also be broken down into malignant or benign.

Fig 1



The skin has several layers **(Fig 1)**, but the two main layers are the epidermis (upper or outer layer) and the dermis (lower or inner layer). Skin cancer begins in the epidermis, which is made up of three kinds of cells (squamous cells, basal cells and melanocytes). Clinical confirmation can be done with a skin biopsy. A shave or punch biopsy is typically sufficient for most nonmelanoma skin cancers, provided it reaches an adequate depth to analyze the tissue pattern and possible perineural invasion. For melanoma, however, complete excisional removal is recommended.

For benign tumors, management is usually for cosmetic reasons and more often than not, diagnosis is made on excision biopsy. For skin malignancies, general management includes surgical removal (wide excision or Mohs) , **radiation therapy, cryotherapy** and **topical treatments** for superficial tumors. For advanced, systemic treatments such as **chemotherapy, immunotherapy**, or **targeted therapy** may be used. The specific treatment depends on the type, stage, and location of the tumor.

Standard surgical excision

For basal cell carcinoma and squamous cell carcinoma, surgery is thought to be the most effective treatment. Wide excision with adequate margin is recommended followed by primary closure, skin grafting or flap cover. Merkel cell carcinoma is a rare and aggressive skin cancer that requires a wider margin of excision. Surgery is especially indicated for lesions close to vital structures involving bone and recurrent cases.

Mohs surgery

More tissue preservation is possible with this technique. Thin layers of tissue are taken only from those areas with positive tumor margins. Due to this the final wound size is much less and the cosmetic outcome is much better. Chemotherapy is often combined with Mohs surgery.

Malignant Melanoma

For early stage melanomas treatment is surgery in the form of wide local excision with sentinel lymph node biopsy, elective node dissection, or both. Skin grafting or tissue transfers may be needed if primary closure cannot be done. SLNB is indicated if the primary tumor has thickness greater than 1mm. If regional lymph nodes are enlarged FNAC should be done for confirmation. If positive then regional block dissection should be done. Block dissection should also be done if SLNB shows metastasis in case of non palpable lymph nodes. For metastasis treatment is by chemotherapy and immunotherapy.

Tumor thickness	Recommended margins
In situ	0.5 – 1 cm
≤ I mm	1 cm
1 – 2 mm	1 – 2 cm
2 – 4 mm	2 cm
≥ 4 mm	2 cm

NECK NODE WITH UNKNOWN PRIMARY

Dr Parthasarathi Ghosh

History & Physical Examination

a. Complete History including Family History
b. Complete Physical examination: Breasts, Skin, Nodal Levels, Pelvic/genital, Rectum
c. Special attention: cranial nerves and skin in head/neck
d. Flexible endoscopes / mirrors

Laboratory Tests

a. CBC, basic biochemistry (LFTs, RFT, albumin, calcium, LDH)
b. PSA in men (if prostate cancer suspected).
c. AFP & beta-HCG (to rule out GCT)
d. TSH (if prior head/neck radiation)

Pathological Confirmation & Initial Triage

a. Tissue Acquisition: Generous biopsy sample (Core / Incisional / Excisional. Avoid FNA if possible.)
b. On-site Triage of the biopsy
    i. Specimen adequacy (ROSE)
    ii. Save parts of the biopsy for ancillary testing: Flow cytometry, ICC, molecular studies
c. Initial classification
    i. Microscopy classification: Adenocarcinoma, SCC, Neuroendocrine etc.
    ii. IHC panels: CK7, CK20, TTF-1, CDX-2, ER/PR

Search for Occult Primary Site

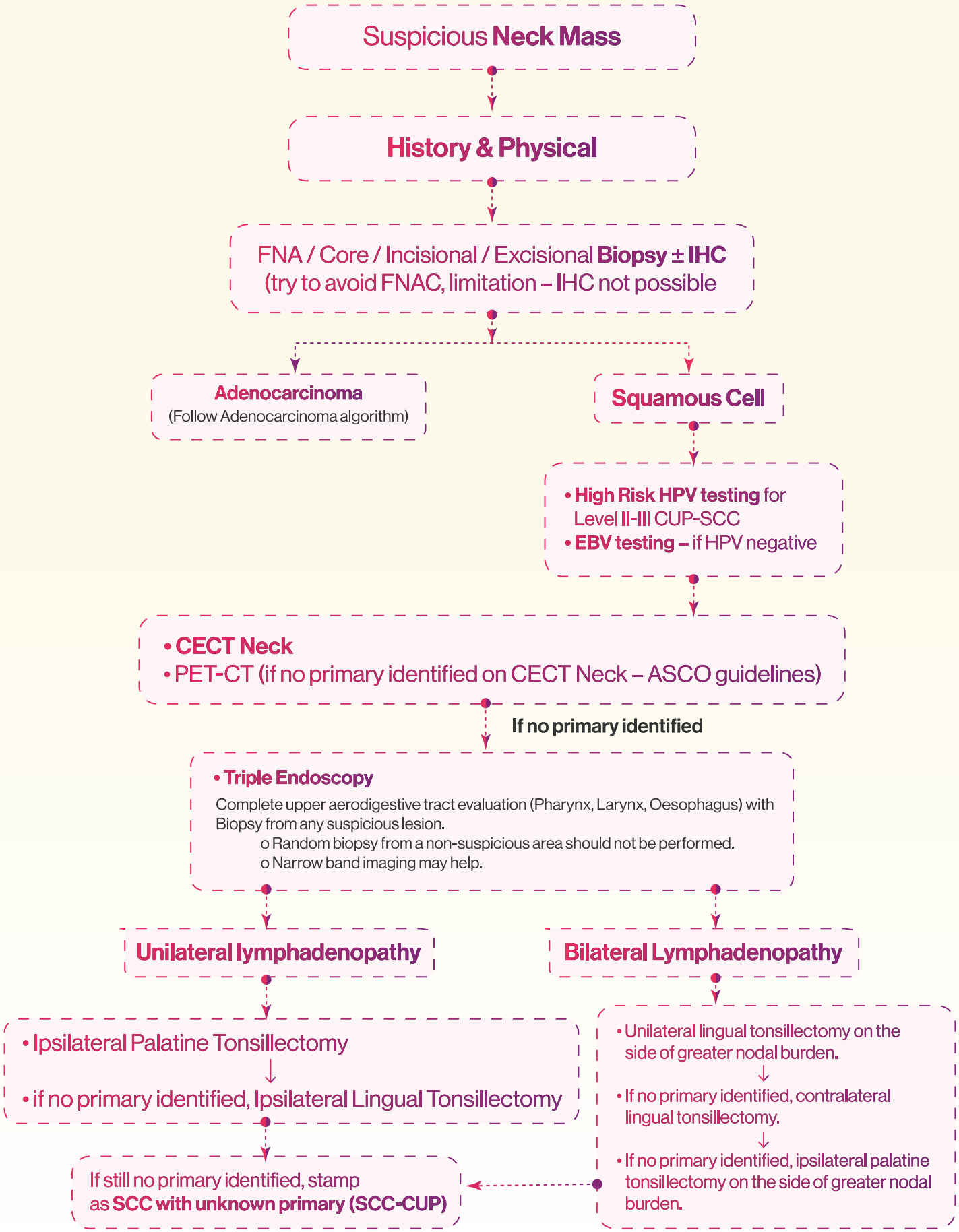
a. Imaging
    i. CECT (neck, chest, abdomen, pelvis)
    ii. MRI for soft tissue definition and skull base invasion
    iii. FDG-PET/CT for detection of primary and staging.
b. Endoscopic evaluation
    i. ENT Panendoscopy: Nasopharyngolaryngoscopy, biopsies
    ii. Bilateral tonsillectomy for HPV positive cancers
    iii. TORS for base of tongue tissue removal.

Advanced Pathological & Molecular Characterization

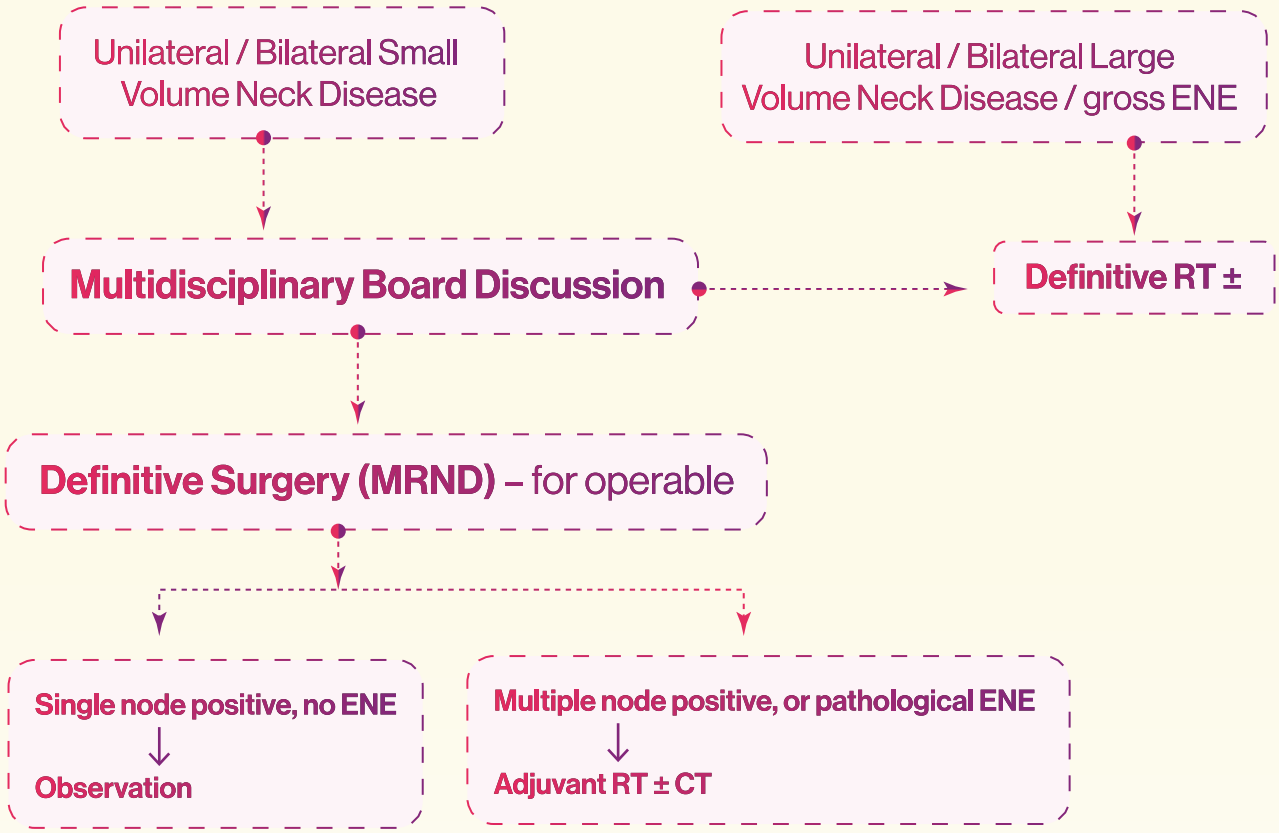
a. Specific subtyping
    i. HPV/p16 positivity – oropharyngeal classification
    ii. EBV positivity – Nasopharyngeal classification
b. Molecular studies
    ii. Gene expression profiling (95% diagnostic accuracy)
    ii. NGS for actionable genetic alterations

TNM Staging and Prognosis

a. T category: T0 (no evidence of primary)
b. N category: based on size and ENE as per oral cancer staging.
c. M category: M0 or M1
d. Stage Grouping
    i. Stage III: T0N1M0
    ii. Stage IVA: T0N2M0
    iii. Stage IVB: T0N3M0
    iv. Stage IVC: M1
e. Prognostic Factors
    i. Histology
    ii. TNM stage
    iii. HPV / EBV status


Suspicious Neck Mass
History & Physical
FNA / Core / Incisional / Excisional Biopsy ± IHC
(try to avoid FNAC, limitation – IHC not possible
Adenocarcinoma
(Follow Adenocarcinoma algorithm)
Squamous Cell
• High Risk HPV testing for Level II-III CUP-SCC
• EBV testing – if HPV negative
• CECT Neck
• PET-CT (if no primary identified on CECT Neck – ASCO guidelines)
If no primary identified
• Triple Endoscopy
Complete upper aerodigestive tract evaluation (Pharynx, Larynx, Oesophagus) with Biopsy from any suspicious lesion.
o Random biopsy from a non-suspicious area should not be performed.
o Narrow band imaging may help.
Unilateral lymphadenopathy
Bilateral Lymphadenopathy
• Ipsilateral Palatine Tonsillectomy
• if no primary identified, Ipsilateral Lingual Tonsillectomy
• Unilateral lingual tonsillectomy on the side of greater nodal burden.
• If no primary identified, contralateral lingual tonsillectomy.
• If no primary identified, ipsilateral palatine tonsillectomy on the side of greater nodal burden.
If still no primary identified, stamp as SCC with unknown primary (SCC-CUP)

SCC-CUP


Unilateral / Bilateral Small Volume Neck Disease
Unilateral / Bilateral Large Volume Neck Disease / gross ENE
Multidisciplinary Board Discussion
Definitive RT ±
Definitive Surgery (MRND) – for operable
Single node positive, no ENE
Observation
Multiple node positive, or pathological ENE
Adjuvant RT ± CT

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