

PAEDIATRIC SURGICAL EMERGENCIES

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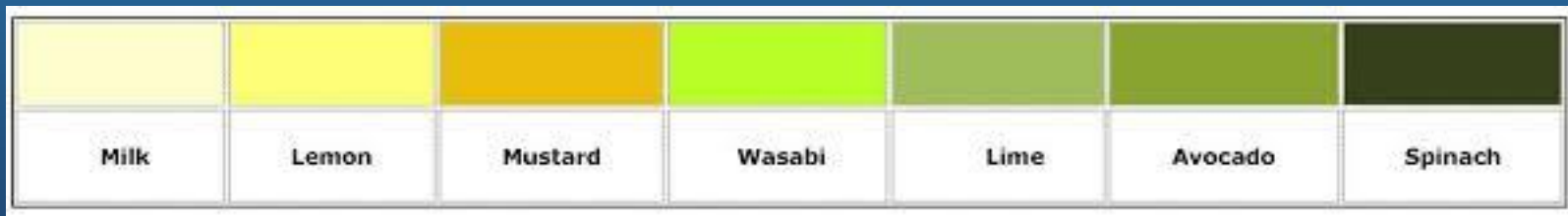
Sydney Children's Hospital, Randwick

VOMITING DDX

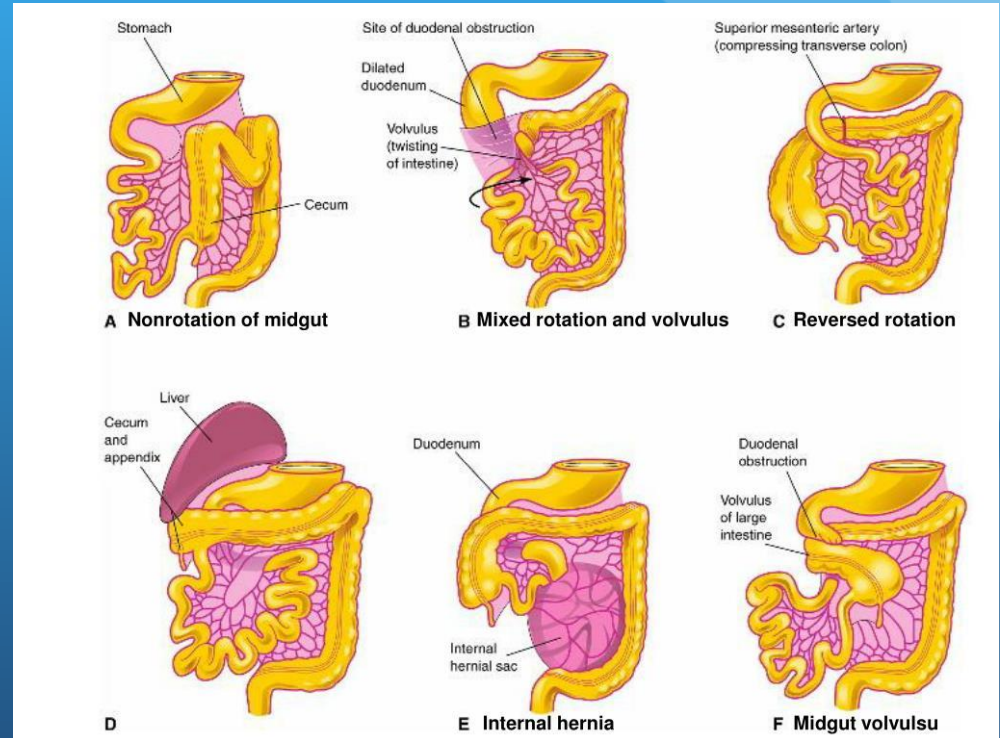
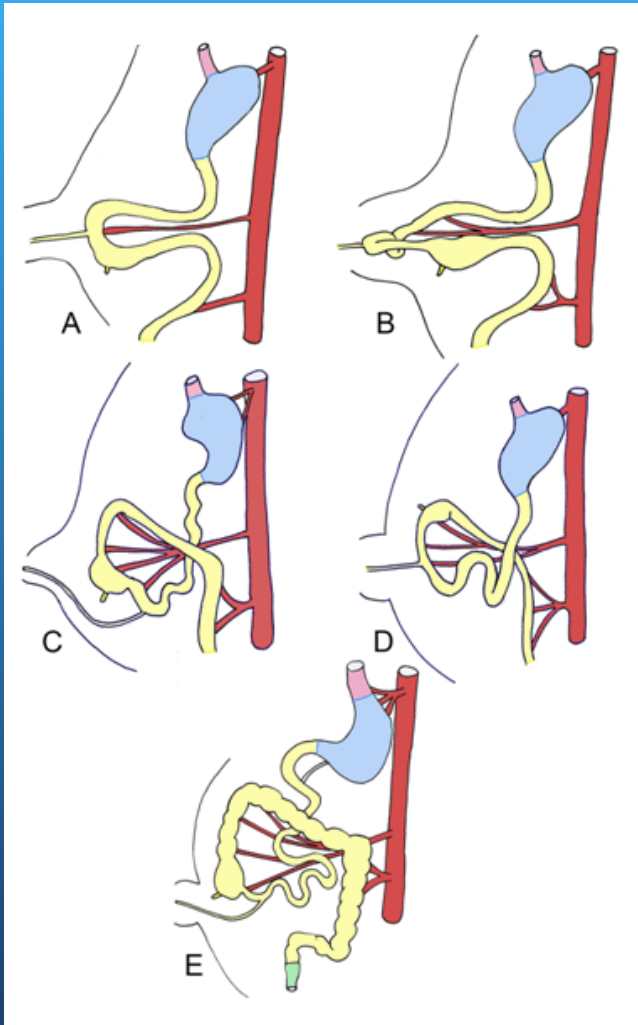
- Gastroenteritis
 - Sepsis
 - Metabolic disturbances
 - Central causes
- Bowel obstruction - AIM
- Atresias
 - Adhesions
 - Appendicitis
 - Anorectal malformations
 - Intussusception
 - Inguinal hernia
 - Malrotation + volvulus
 - Meckel's
 - Malignancy/mass (e.g. duplication cyst)
 - Idiopathic hypertrophic pyloric stenosis

BILE-STAINED VOMITING

- Always seek mechanical cause
- Age - specific
- Previous surgery
- MALROTATION / VOLVULUS



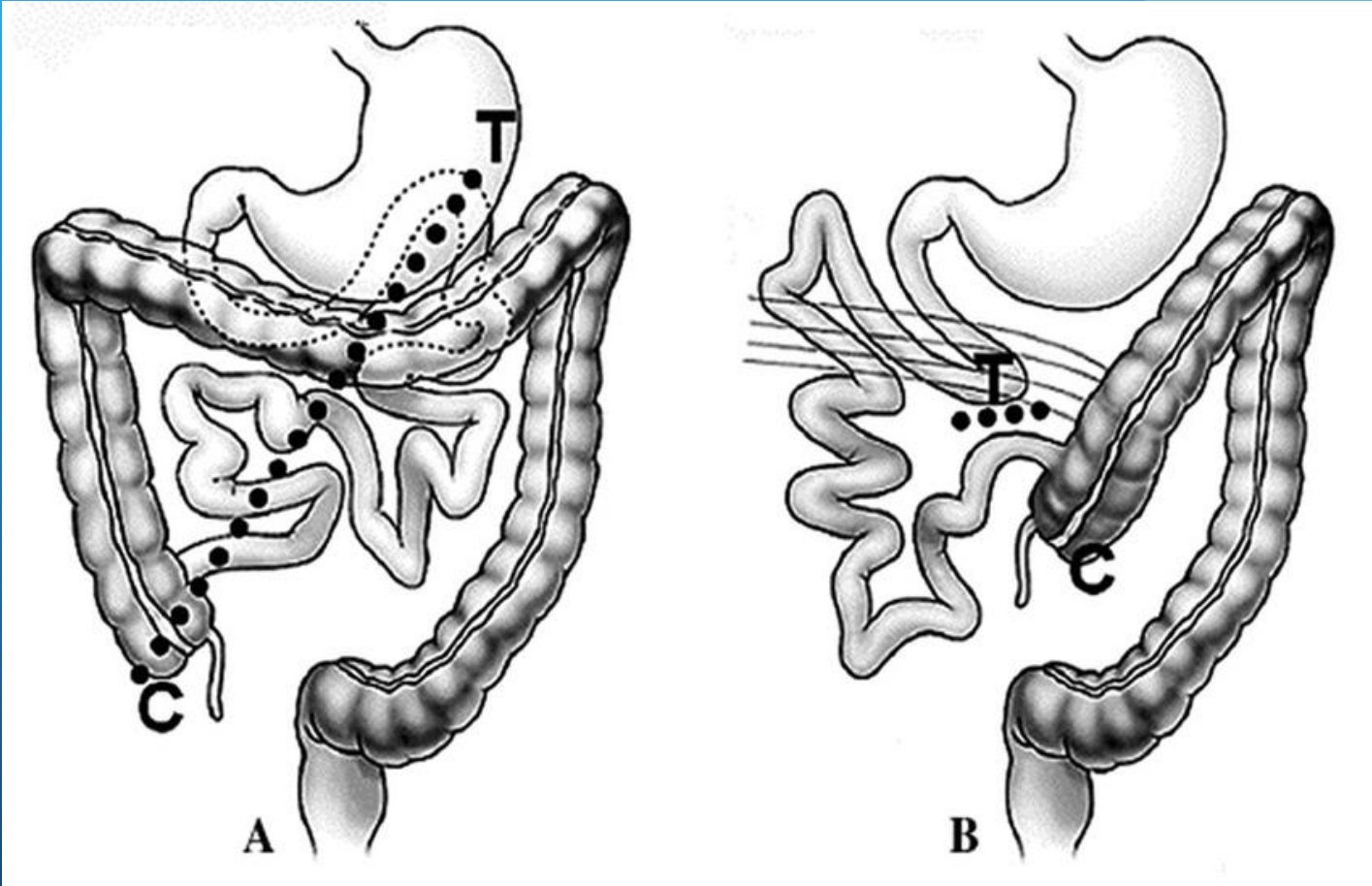
What is Malrotation? ...



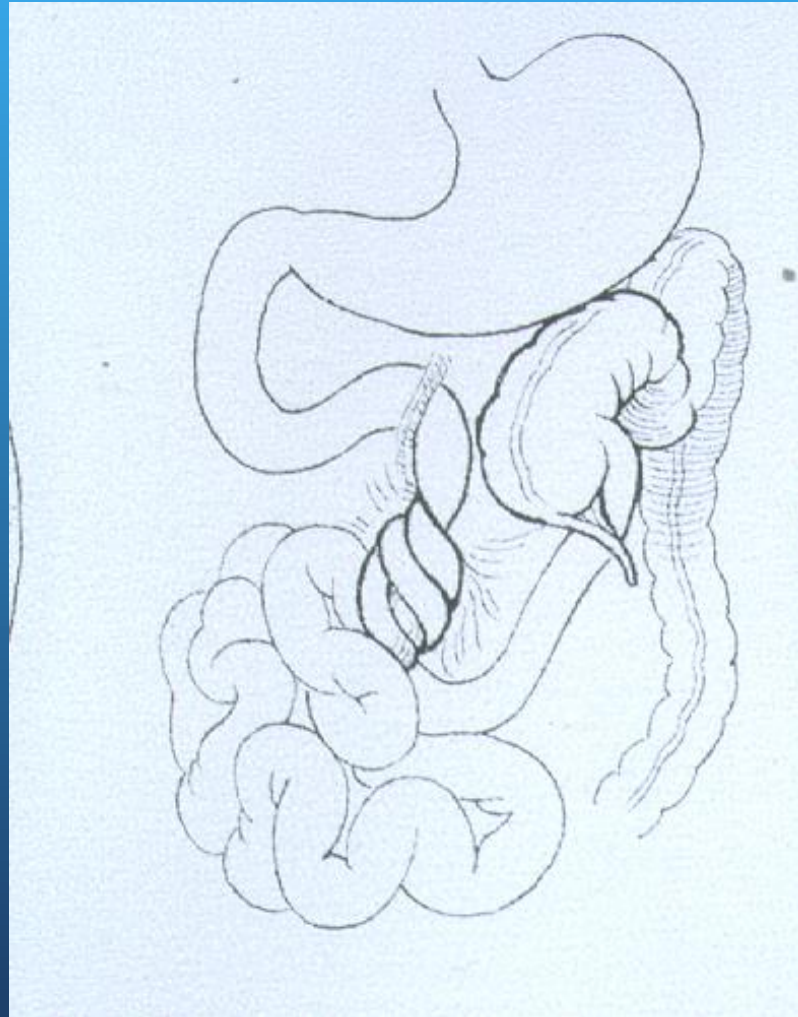
<https://www.youtube.com/watch?v=vJA1A0v6Aa4>

MALROTATION

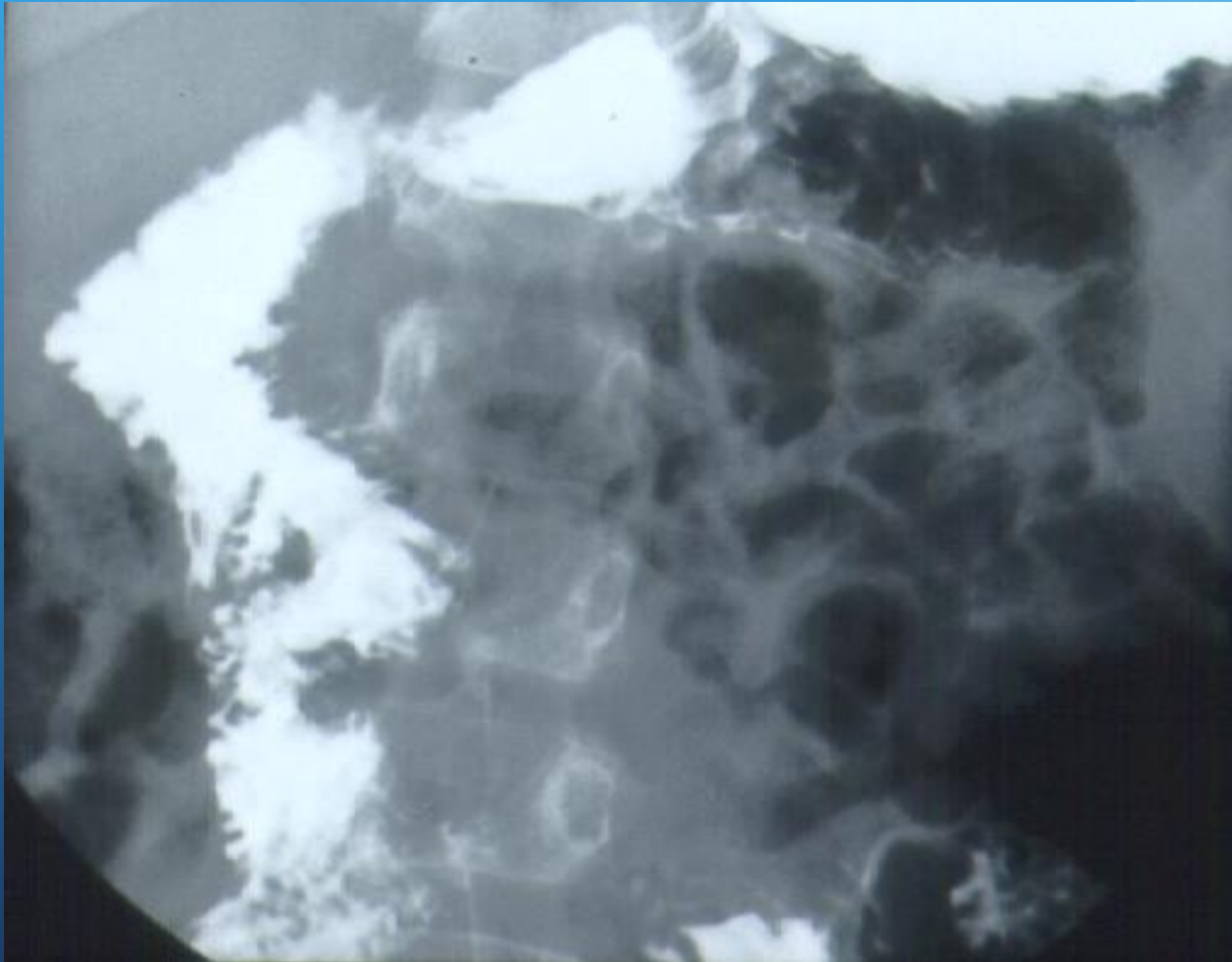
- Incidence unclear
- First few weeks of life
- Can occur at any age; case series
 - 30% in the first month of life (2/3 in the first week)
 - 58% present before 12 months of age
 - 75% present before age 5
- Volvulus occurs in 40-50%
 - Bile-stained vomiting
 - Variable amounts of distension
 - Look very well initially



MALROTATION with VOLVULUS



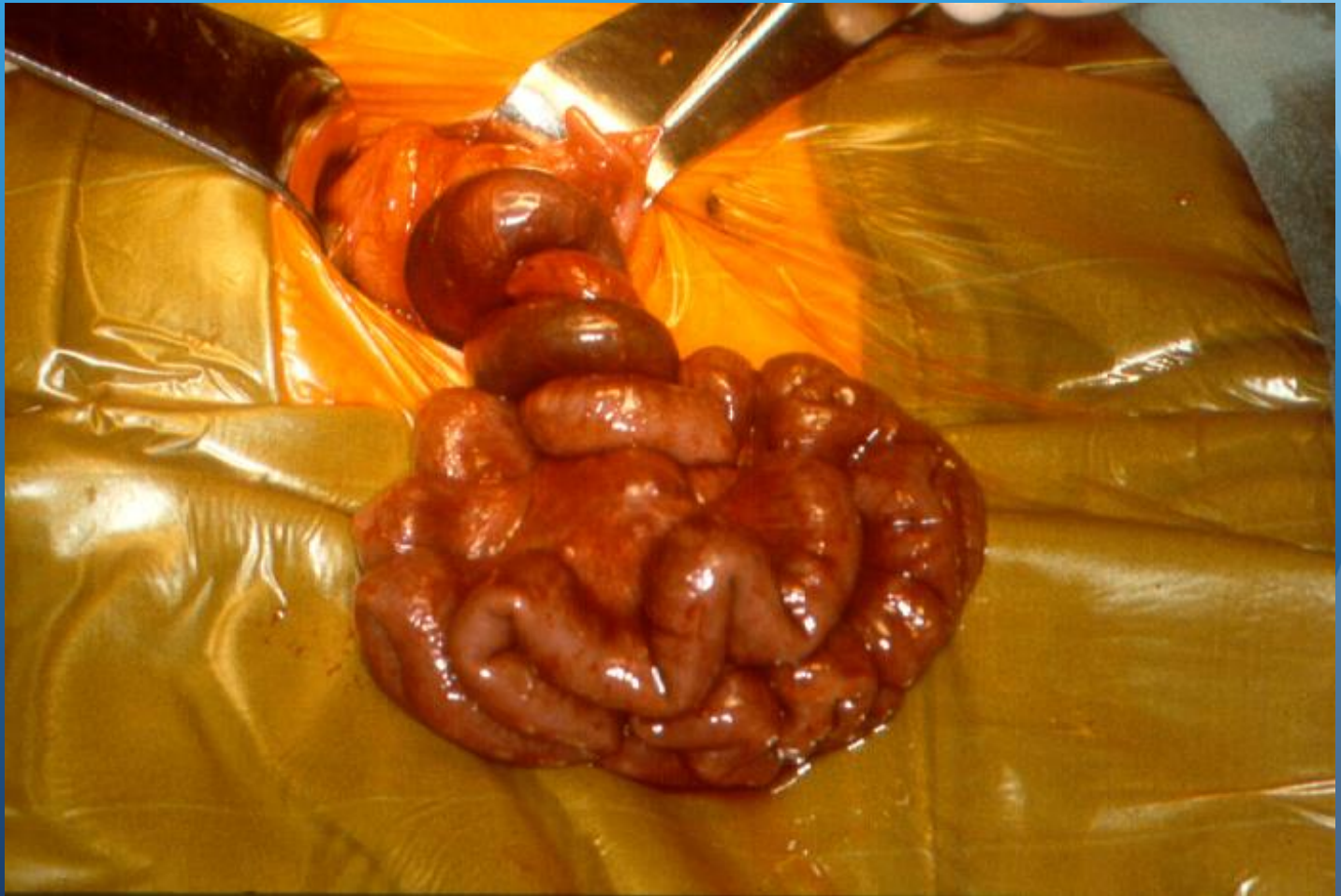
MALROTATION



MALROTATION with VOLVULUS



VOLVULUS



VOLVULUS



NARROW-BASED MESENTERY



MANAGEMENT

- Fluoroscopy 'UGI contrast study' to make diagnosis
 - DJ flexure should be left of midline and level with pylorus
 - Laterally, D3 is not located posteriorly
- US to examine SMA / SMV relationship
- Laparotomy
- Pulse oximetry intra-op
- Consider second look laparotomy after 48 hours
- Prophylactic appendicectomy

PULSE - OXIMETRY



VOLVULUS POST-OP



PYLORIC STENOSIS

- 1 : 300
- Boys 4 : 1
- Familial 1 : 20 - 1 : 5
- Median age onset of vomiting 2-3 wks
- Very unusual > 8 wks

PS - Clinical

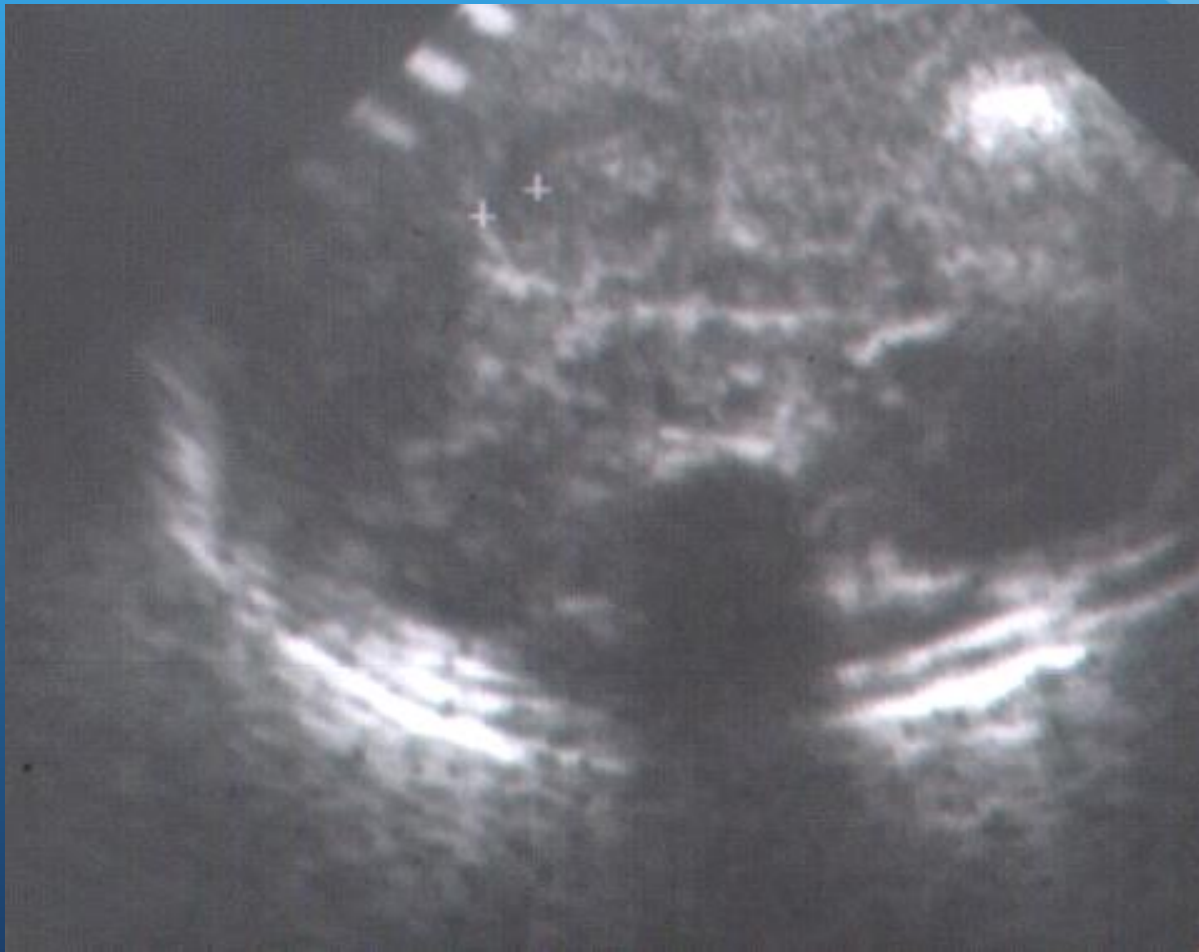
- Non-bilious vomiting, 30-60 mins after feed
- Remains hungry
- Projectile
- Coffee grounds

- DD - Gastro-oesophageal reflux

PS - Diagnosis

- 85% History and examination
- Gastric peristaltic waves
- Palpable “tumour” or “olive”
- US 90% Sens, 100% Spec
- Muscular thickness >4mm, Length >16mm

PYLORIC STENOSIS - US



PS - Resuscitation

- Hypochloraemic alkalosis
- Renal K^+ loss to spare H^+
- Dehydration lose H^+ to conserve Na^+

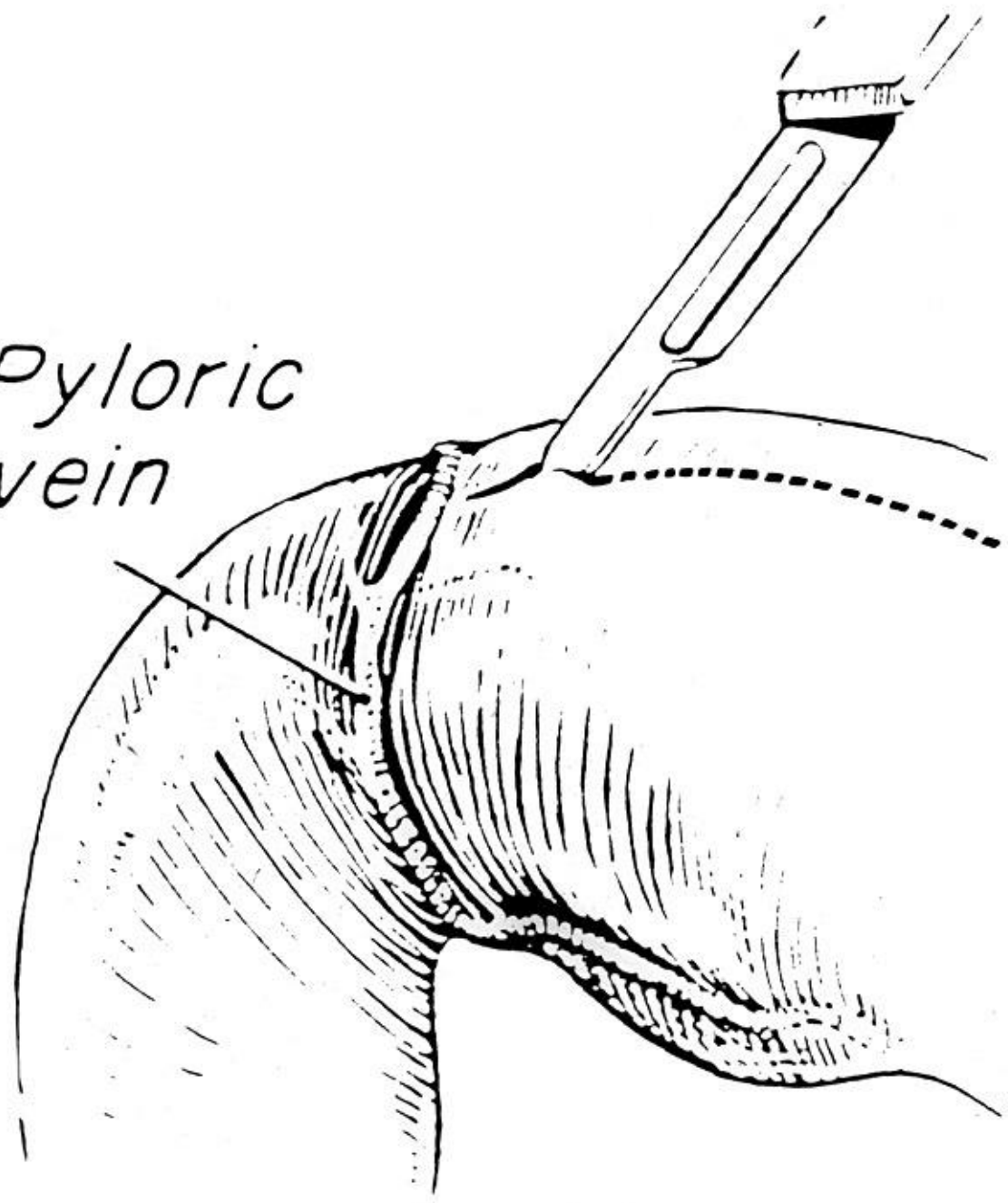
- N/2+10% Dextrose + 10mmol K^+ (if K^+ normal) in 500ml bag
- OT when electrolytes all normal

OT - Pyloric stenosis

- RUQ
- Supra-umbilical
- Laparoscopic

- Feed 8hrs post-op and grade up

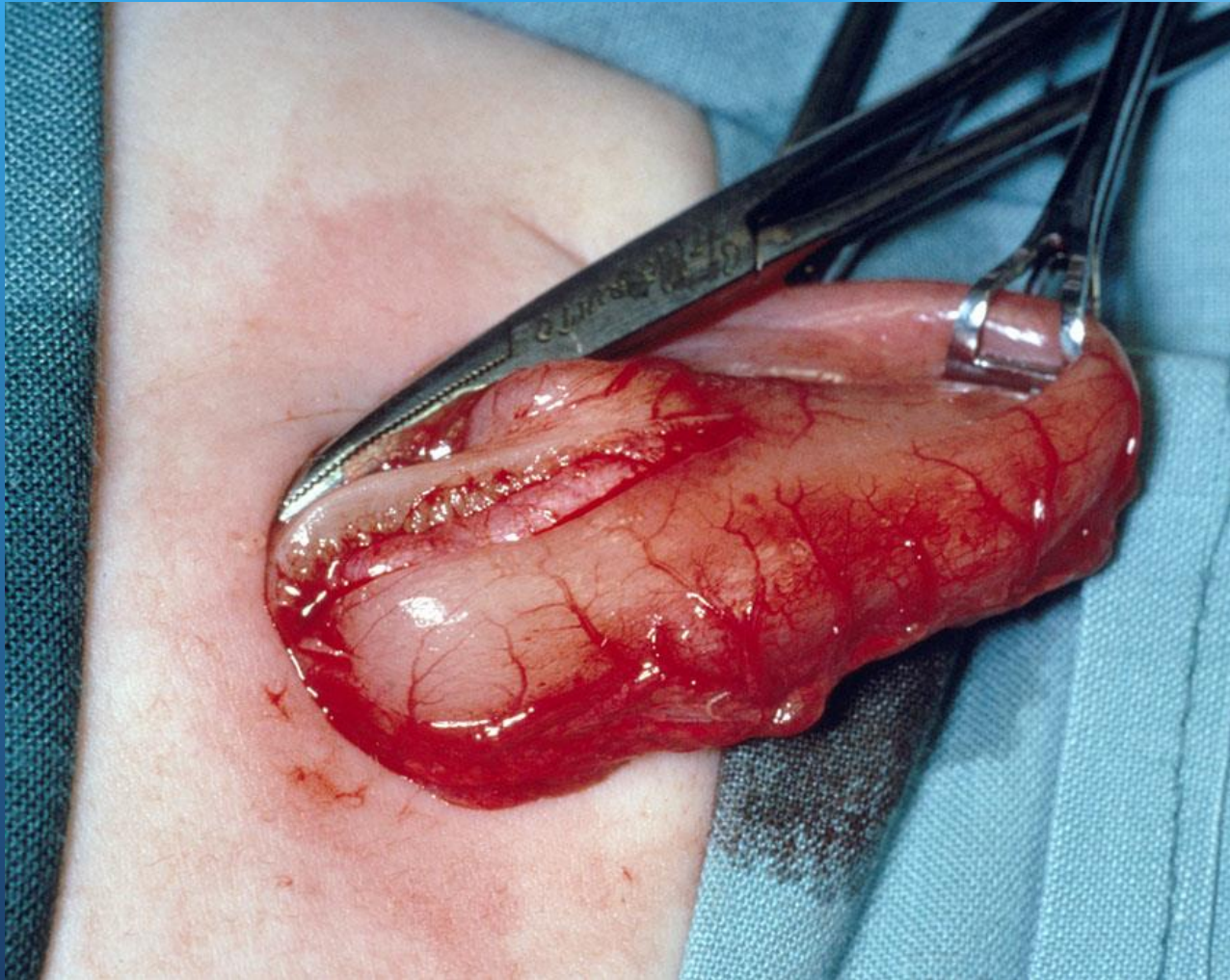
*Pyloric
vein*



PYLOROMYOTOMY



PYLOROMYOTOMY



Approach

- Laparoscopic approach

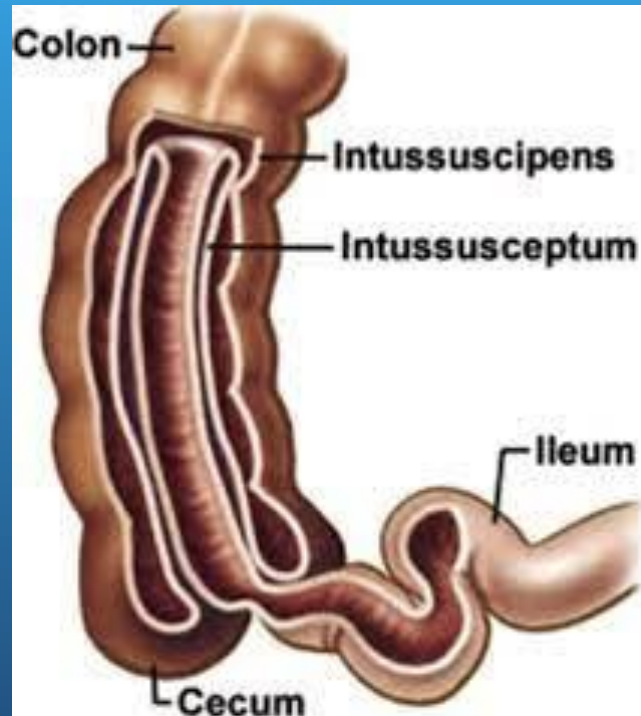
INTUSSUSCEPTION

- Median age 8 months
- 90% “idiopathic” 3mths - 3 yrs
- Anatomical lead point
- Seasonal
- Adenovirus 50% stools
- Relationship to rotavirus vaccination

INTUSS - Clinical

- Intermittent, colicky pain
- 15mins - 1hr apart
- Vomiting
- Blood - 1/3
- Mass - 1/4

INTUSSUS - Clinical



INTUSS - Diagnosis

- Clinical
- AXR
- US
- Contrast enema

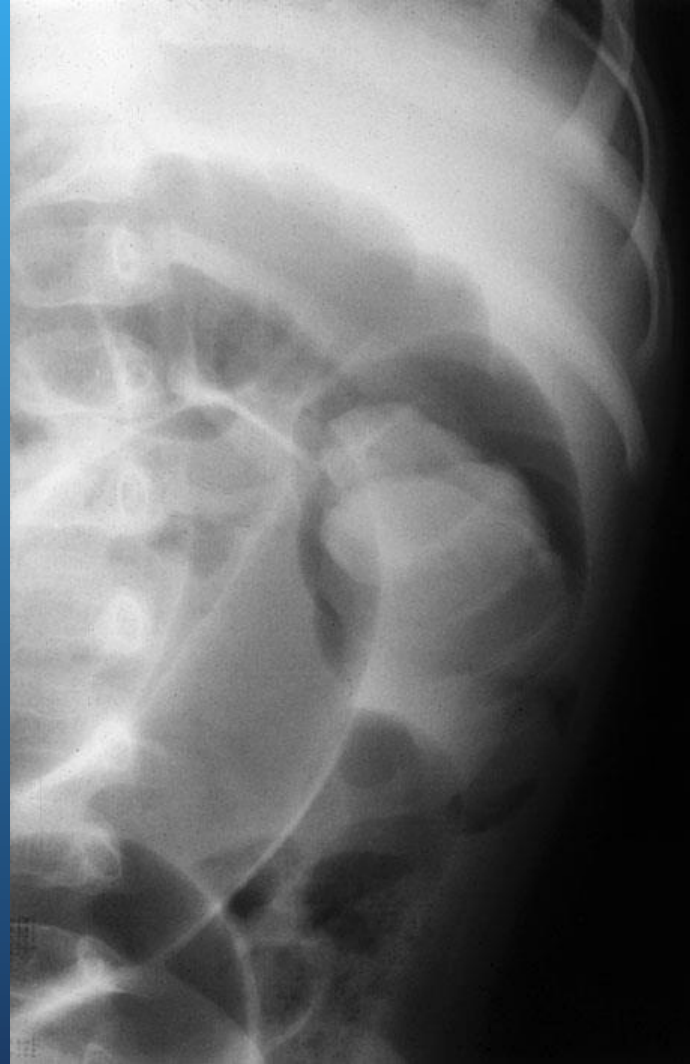
INTUSSUSUSCEPTION



INTUSSUS - US



AIR REDUCTION



INTUSSUSCEPTION - AXR



AIR ENEMA



INTUSSUSCEPTION

- 88% Ileo-colic
- US useful
- Air reduction enema - 80 - 90% success
- 10% recurrence
- Can redo after 3 hours with further 50% reduction

INTUSSUSUSCEPTION - OT



LEAD POINT - MECKELS



APPROACH

- US of Intussusceptum
- If ischaemic then straight to OT
- Saline reduction
- US control in A&E
- Laparoscopic control for failed air enema

APPENDICITIS - DDX

- Gastroenteritis
- Constipation
- UTI
- Mesenteric adenitis
- Mittelschmerz
- Inflammatory BD
- Meckel's
- Intussusception
- Testicular torsion
- Ovarian torsion
- Ruptured ovarian cyst
- Pneumonia
- DKA
- HSP
- Other

APPENDICITIS - KEYS

- Course of disease
- Careful history
- Observation
- Physical examination

APPENDICITIS - Hx

- Age, sex
- Location
- Timing
- Intensity
- Associated symptoms - feeding, sleeping, nausea, vomiting, urine, stools
- Past Hx ??

APPENDICITIS - PATHOPHYSIOLOGY

- Luminal obstruction
 - lymphoid hyperplasia (viral illness, bacterial enterocolitis)
 - foreign body (faecolith, worms, tumour)

APPENDICITIS - AXR



APPENDICITIS - <age 5

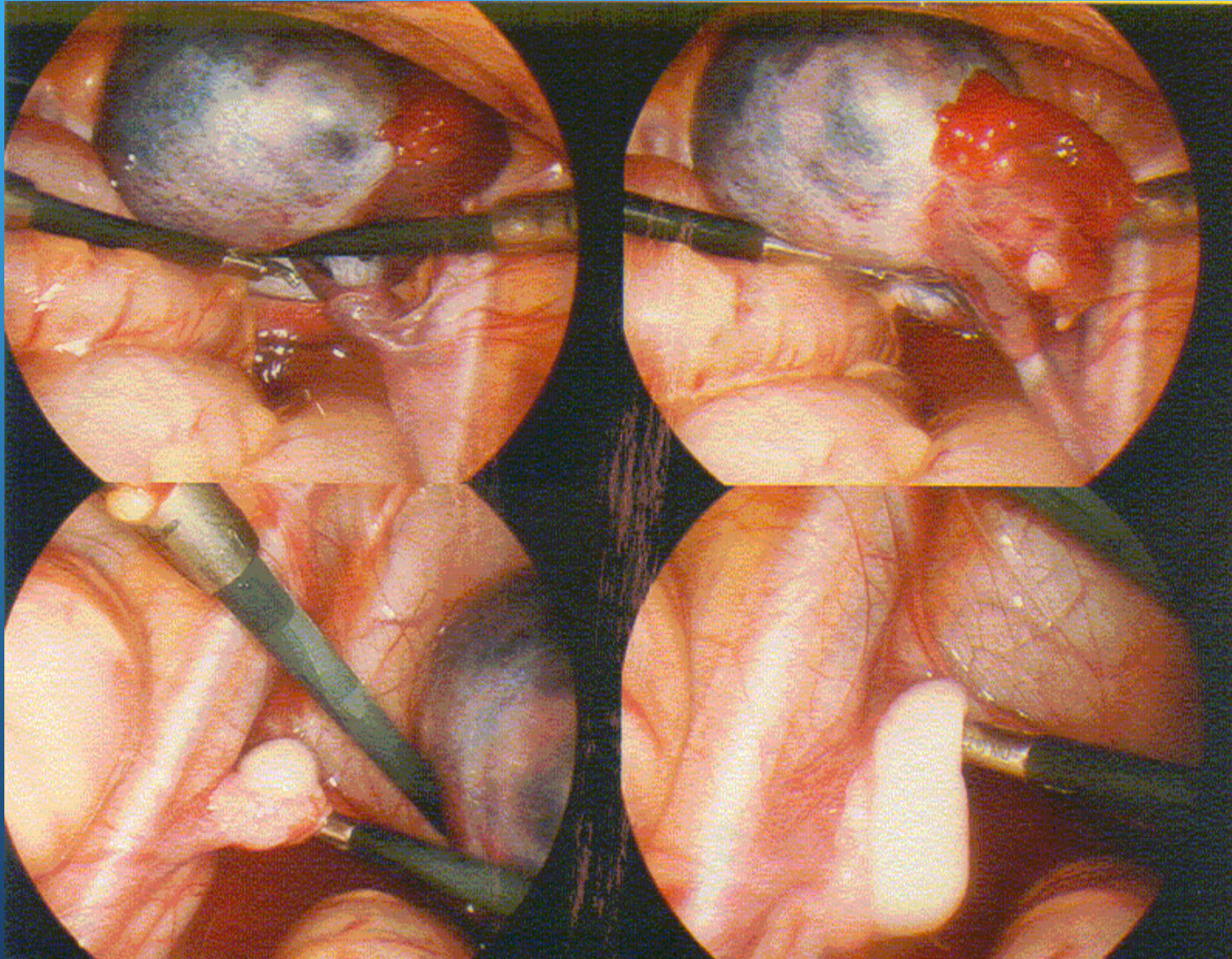
- Difficult history
- Vague symptoms
- Gastro type presentation
- Difficult examination
- Advanced signs
- Vigorous resuscitation
- High morbidity / mortality (>50% perf)

APPENDICITIS - Girls

- Careful history
- Menstrual cycle
- Past History
- History and location of pain
- LAPAROSCOPY
- **DON'T FORGET PID AND PREGNANCY IN KIDS!!!**

Questions

OVARIAN TORSION



INCARCERATED HERNIA

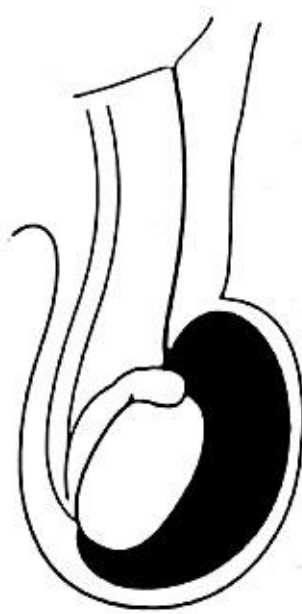
- Commonest in first 3mths
- Irritable, tender
- Vomiting, SBO
- Most can be reduced

- Do not reduce if red, swollen, long Hx then straight to OT

Peritoneal cavity
Process vaginalis



Normal



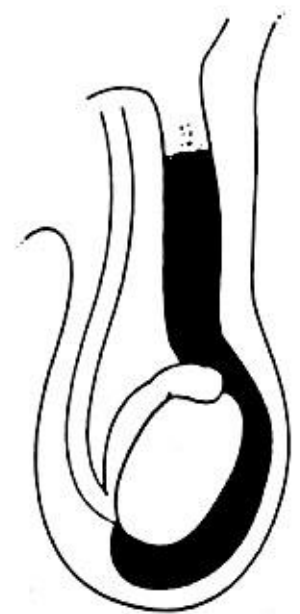
Hydrocele



Communicating hydrocele



Inguinal hernia



Complete inguinal hernia

INCARCERATED HERNIA



INCARCERATED HERNIA



PARAPHIMOSIS



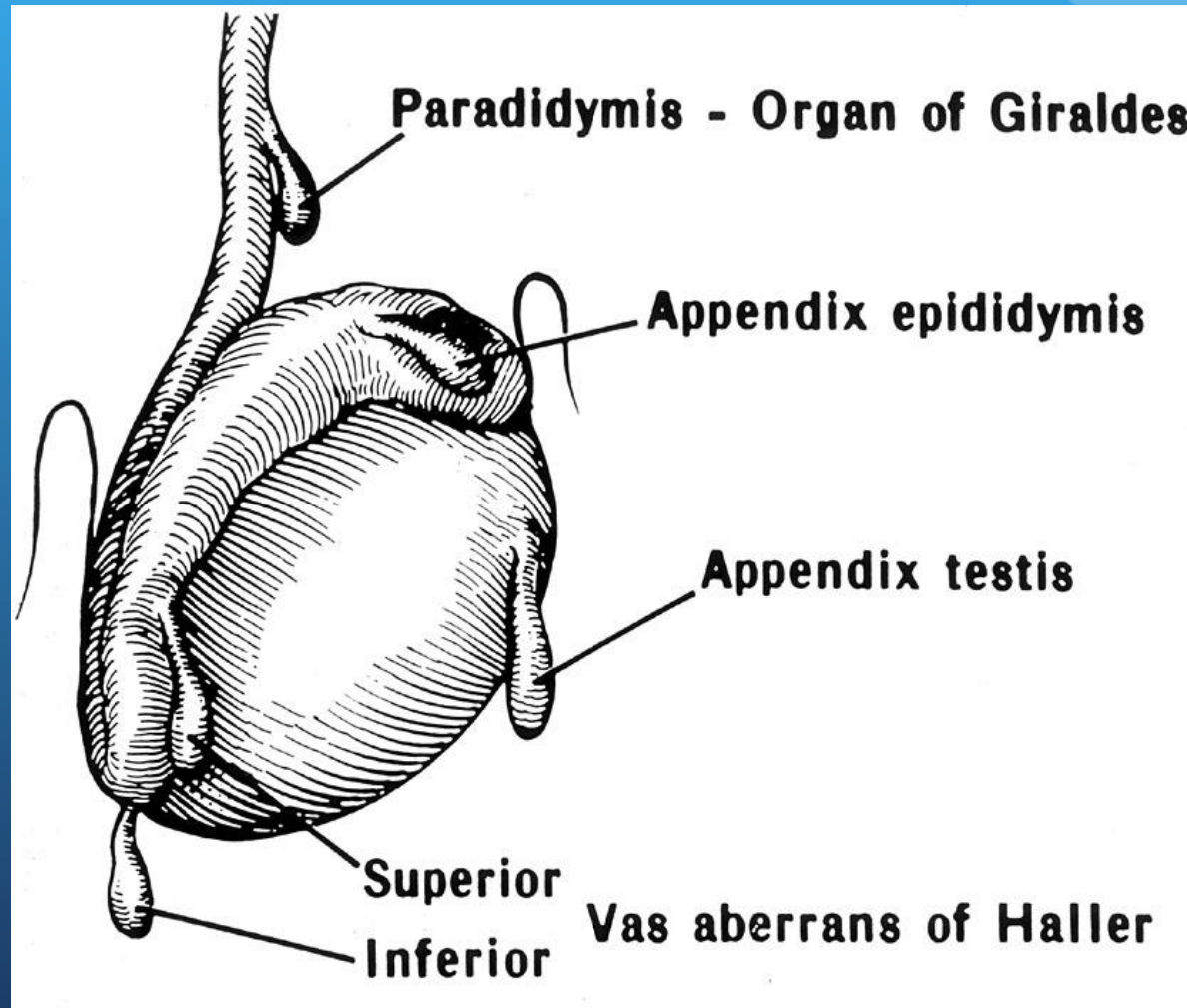
ACUTE SCROTUM

- Torsion testicular appendage
- Torsion testis
- Hernia
- Trauma
- Infections
- Idiopathic scrotal oedema
- Henoch Schonlein Purpura
- Tumour

TORSION TESTICULAR APPENDAGE

- Peak 2-3 yrs before testicular torsion
- 95% Hydatid of Morgagni
- Blue-dot sign
- Pain confined to upper pole
- Quickly becomes indistinguishable from testicular torsion

APPENDICES - Testis and epididymis



TORSION APPENDIX TESTIS



TORSION APPENDIX TESTIS

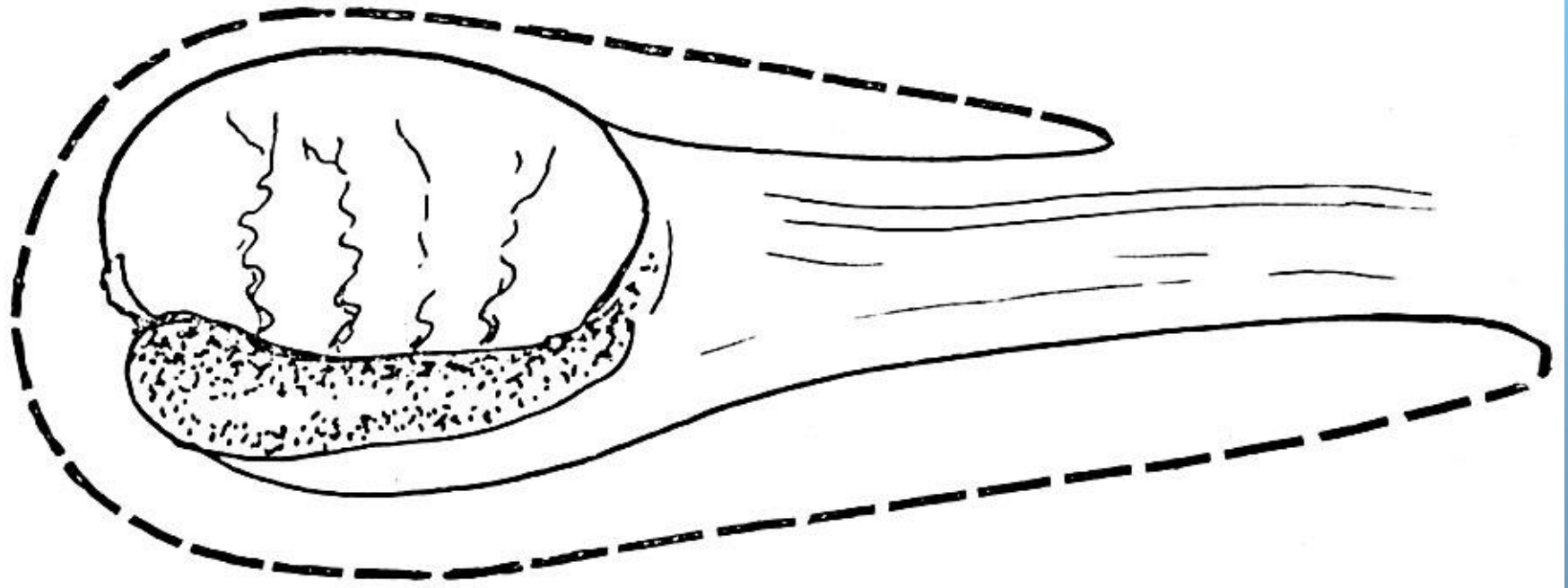


TORSION TESTIS

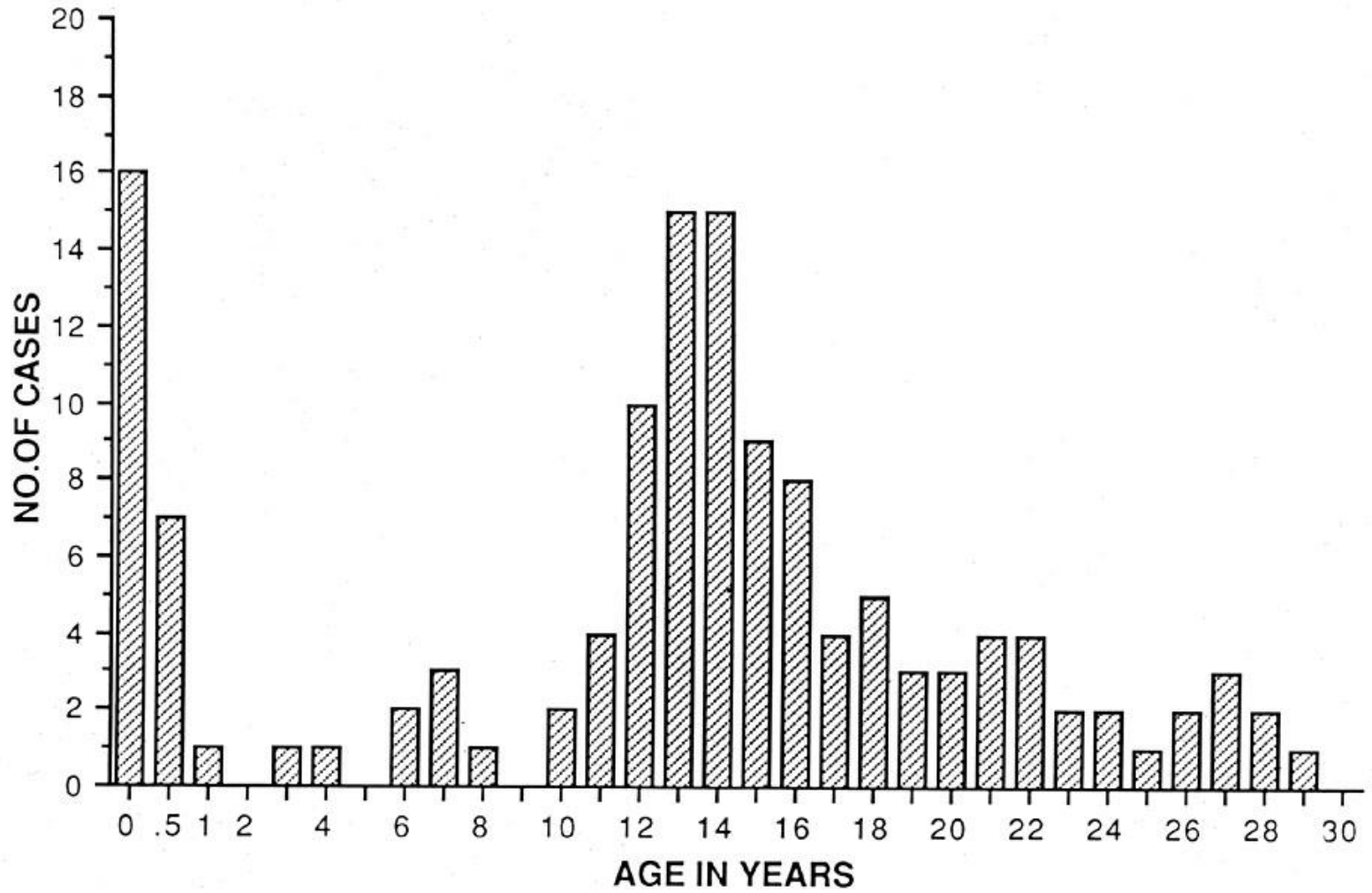
- Neonatal
- 12 onwards
- Rapid onset severe pain
- Abdominal pain, vomiting
- Unable to walk

NEONATAL TORSION





TORSION OF THE TESTIS

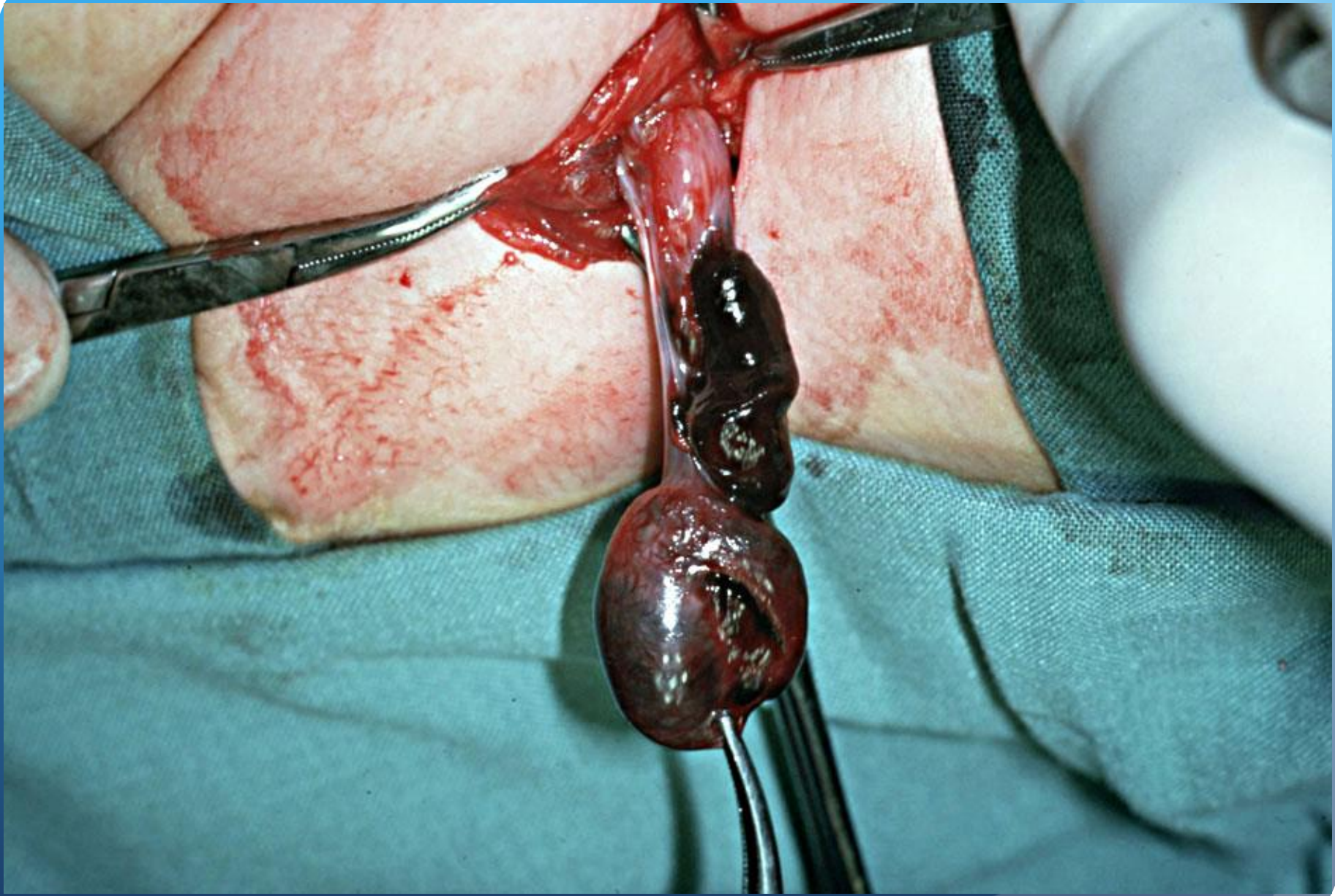


TORSION - Clinical

- Variable signs
- Tender, swollen testis
- Red, possible reactive hydrocoele
- Elevated
- Loss of cremaster reflex
- Contralateral testis horizontal lie

HORIZONTAL LIE





MANAGEMENT

- Explored <6hrs 85-97% survival
- After 24hrs < 10%

- US - can cause delays
- US - more inaccurate in smaller child
- US - can give a false -ve
- US - report will NEVER rule out torsion

INCARCERATED HERNIA



EPIDIDYMO-ORCHITIS

- EXTREMELY rare between age 1 and commencing sexual activity
- <1 think urinary tract abnormality
- Urinary Sx can go with all

IDIOPATHIC SCROTAL OEDEMA



HENOCH SCHONLEIN PURPURA



TESTICULAR TUMOURS

- Does occur in children
- 18mths (yolk sac), 3yrs (teratoma)
- Usually not acute onset
- US diagnostic

TESTICULAR TUMOUR



TESTICULAR TUMOUR



MYCOBACTERIAL LYMPHADENITIS

- MAIS -Avium, Intracellulare, Scrofulaceum
- Soil - pharynx mucous membrane
- Submandibular lymph nodes
- Not contagious
- Usually asymptomatic



MAIS - Ix

- History
- Examination
- Mantoux - Typical and atypical
- Read at 48-72 hrs
- Both +ve, atypical 2x size

MAIS - PATHOPHYSIOLOGY

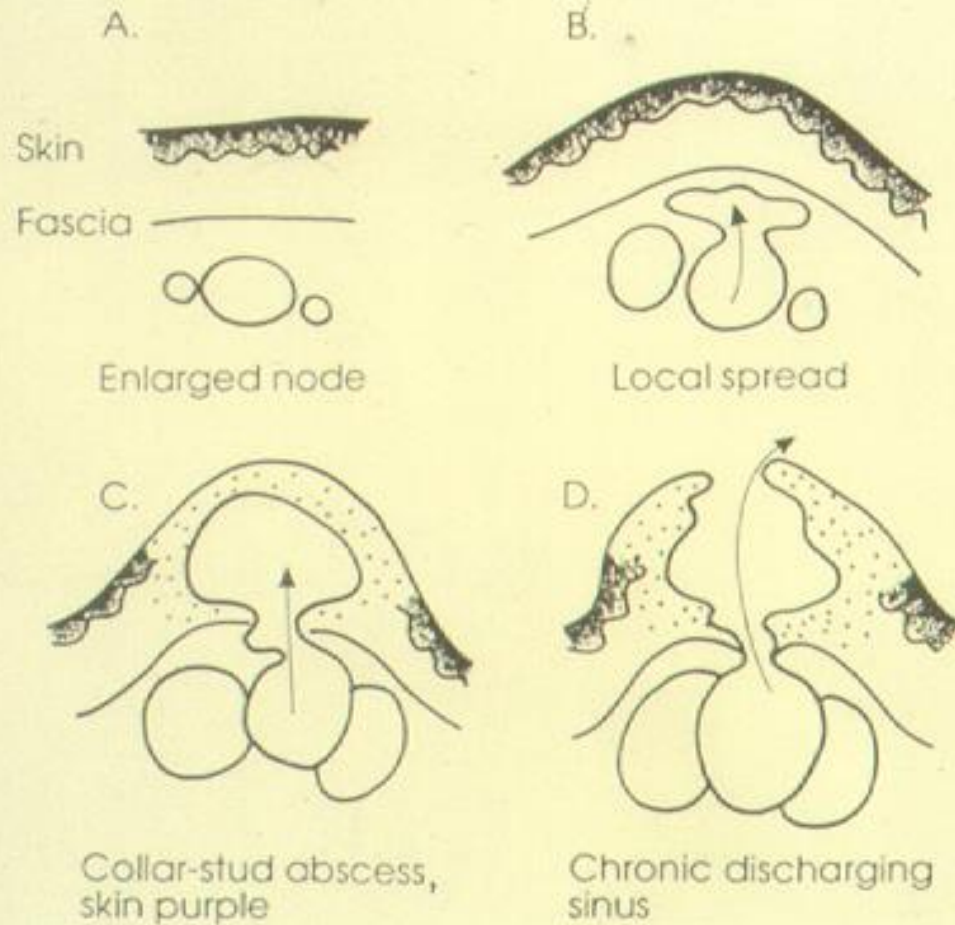


Fig. 9.15: The four stages of *Mycobacterium avium intracellulare scrofulaceum* (MAIS) infection in a lymph node.

MAIS - Rx

- Complete excision of affected nodes
- Drain and curettage
- Clarithromycin

- Mandibular branch of Facial nerve

MINOR BURNS

- ADULTS

- 2/3 at work
- 50% flame
- 10% chem / elec

- CHILDREN

- 2/3 at home
- 60% scald
- 25% flame (older)
- Thin skin, delayed removal of clothing, poor first-aid

FIRST - AID

- Stop the burning
- Remove clothing
- Cool the burn

COOLING

- Running water (15 - 20 deg C)
- Soaked dressings
- Fine mist spray
- Swimming pool, stream, dam, ocean, beer
- 20mins in first 3 hrs
- Keep rest of patient warm
- NEVER USE ICE !!

BURN COOLING



BURN COOLING



BURN REFERRAL CRITERIA

- Burns >10% TBSA
- Inhalational injury
- Electrical / chemical
- Circumferential
- Special areas - Face, hands, feet, genitalia
- Extremes of age
- Other medical disorder (esp trauma)

SCALD - Sup partial thickness



BURN - Deep partial thickness



BURN - Deep



BURN - Mixed



TRANSPORT / DRESSINGS

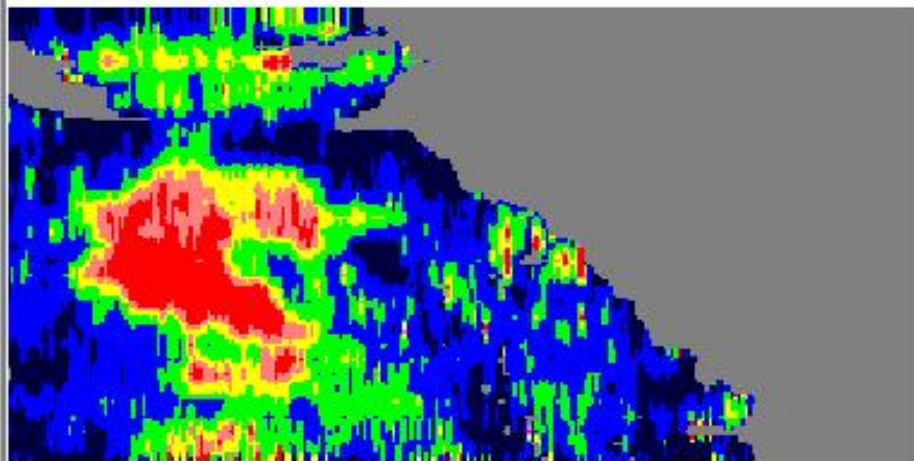
- ACUTE

- Continue cooling
- Send water container or fine mist spray
- Keep child warm
- Cling wrap

- LATE PRESENTERS

- Jelonet / Bactigras
- SSD if sloughy
- We will tend to use a longer-term dressing

Blood Flow Image

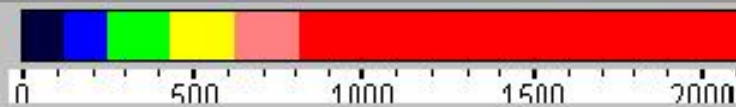


Colour Video Image



Standard
(0 - 1000)

Low Blood Flow



Quick Statistics

ROI No	Mean	Valid (%)	Area