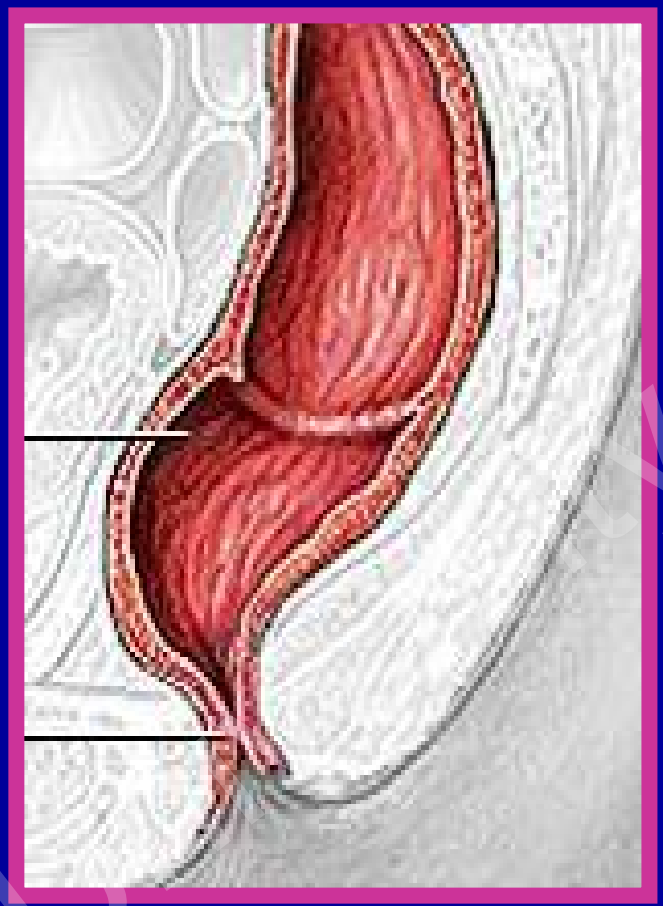
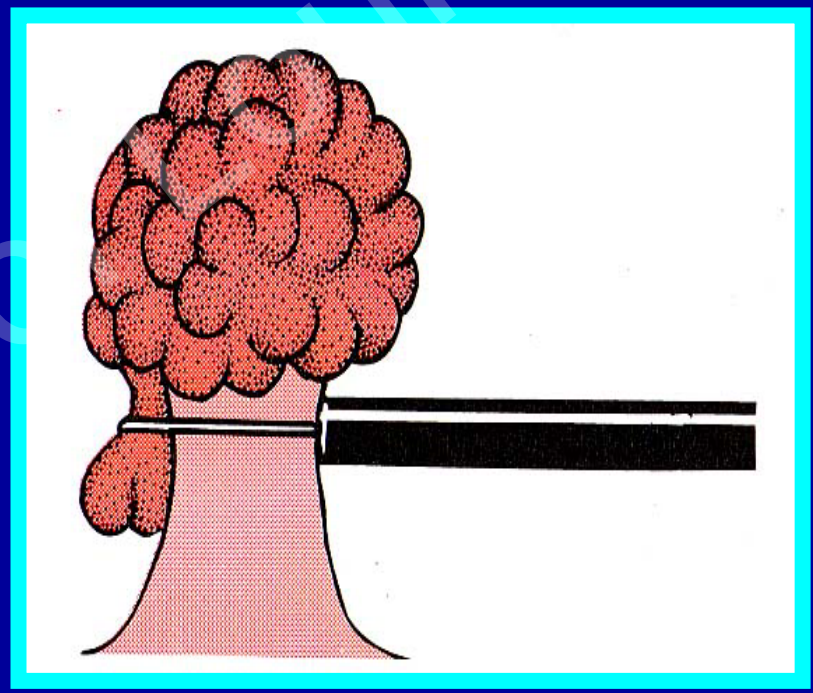
Diagnostic and Therapeutic Colonoscopy





Indications for Colonoscopy

Diagnostic

Unexplained GI symptoms and signs
Unexplained rectal bleeding
IBD
Stricture or colonic narrowing
Diverticular disease
Infectious, radiation or ischemic colitis
Endometriosis
Pneumatosis cystoides intestinalis

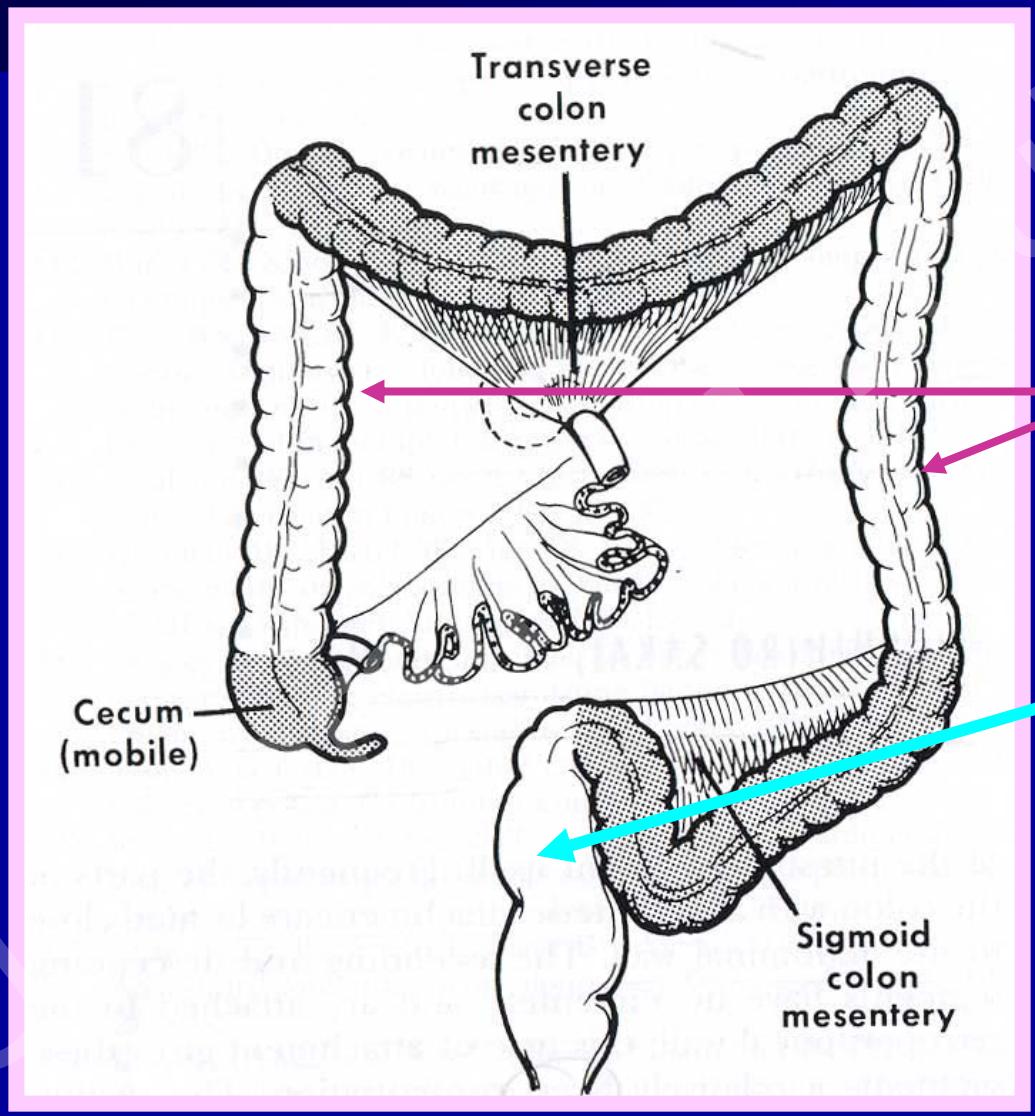
Therapeutic

Polypectomy
Foreign body removal
Bleeding site localization
Hemostasis
Tumor resection
Colonic decompression

Screening and Surveillence

Average, high risk
Polyp and cancer follow-up

Predictable Areas of Loop Formation

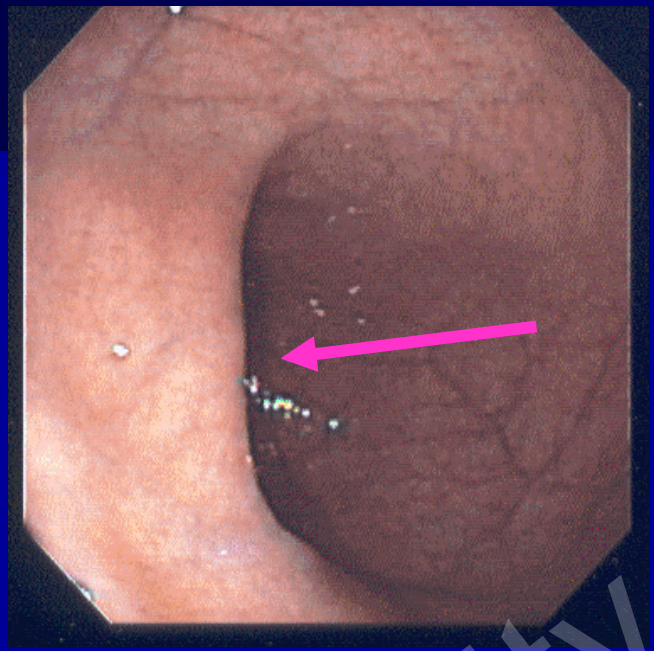


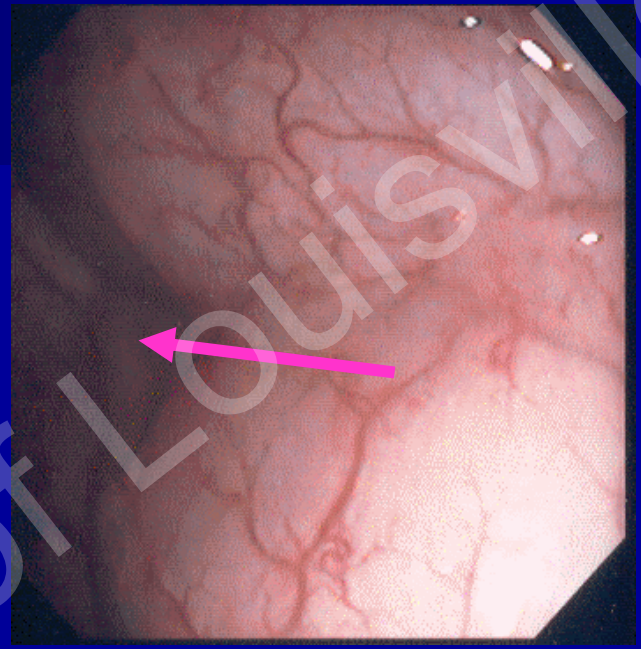
= Areas at Risk for Loop

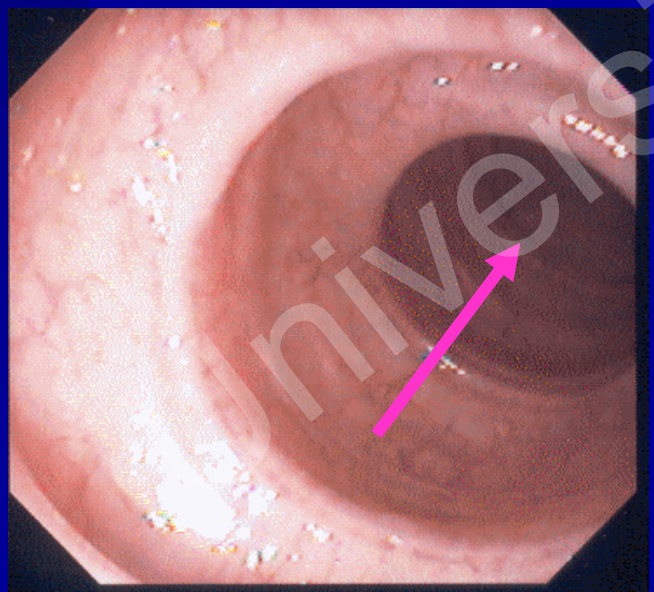
Retroperitoneal

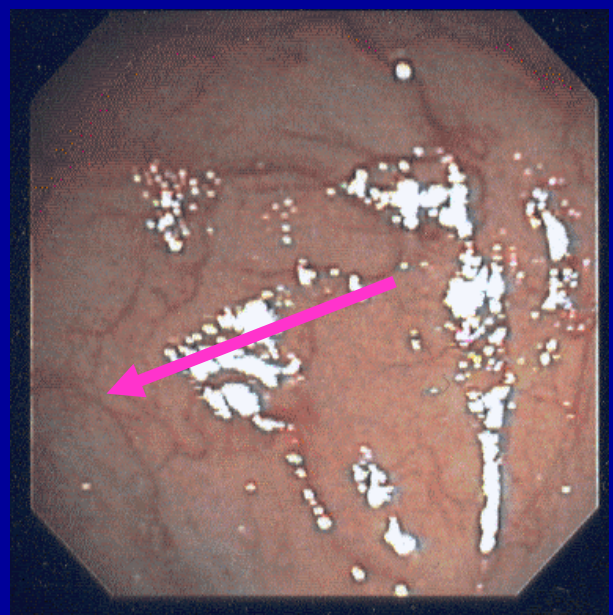
Below Peritoneal Space

Lumenal Hints in the Colon









Landmarks for Lumen

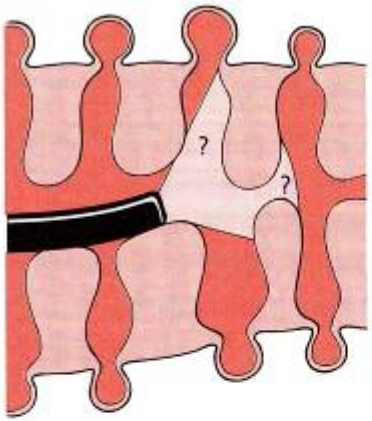


Fig. 9.45 (a) Choosing the correct path can be difficult in diverticular disease . . .

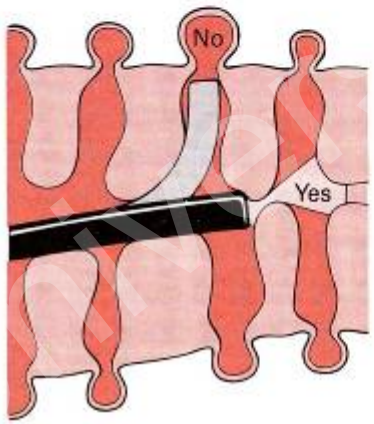


Fig. 9.73 The longitudinal bulge of a taenia coli shows the axis of the colon.

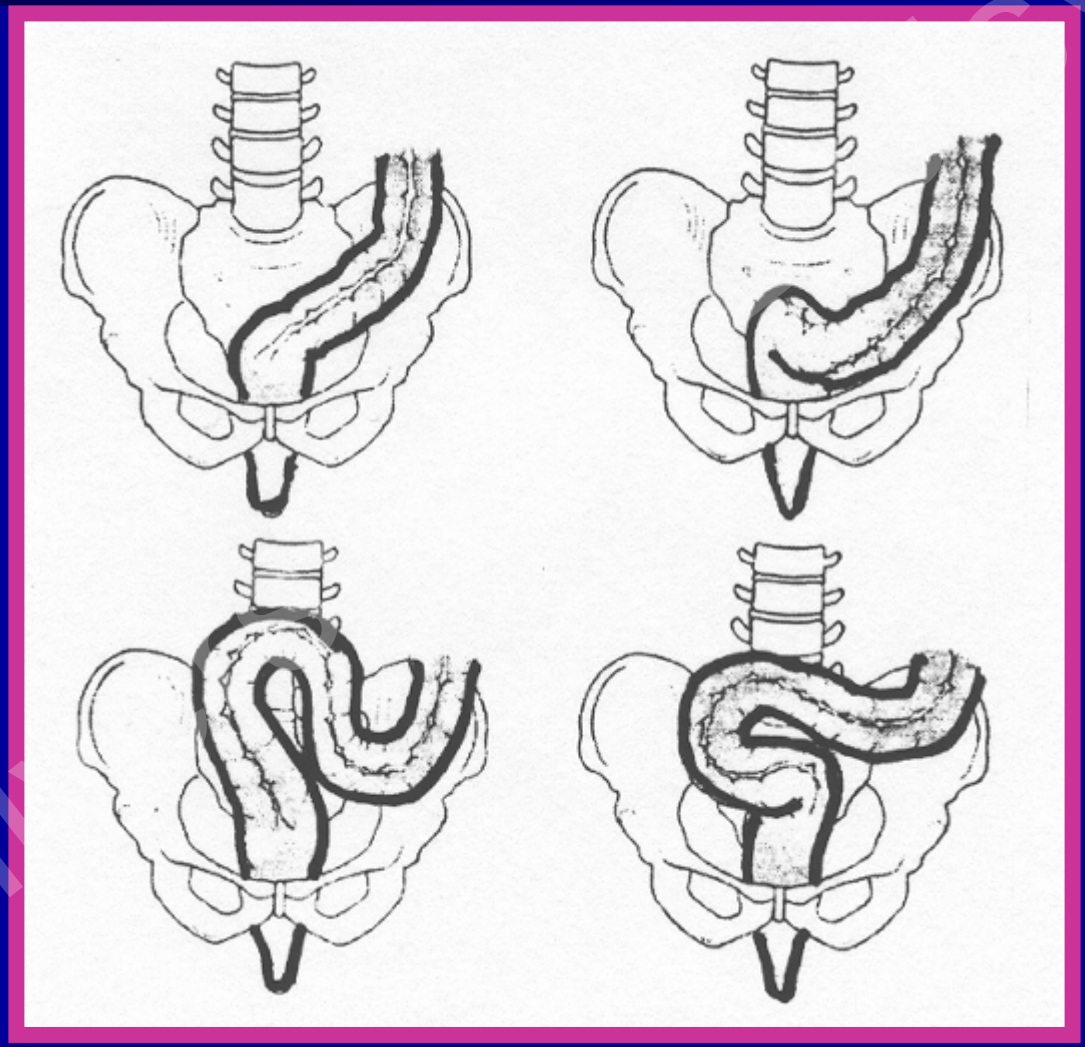
Luminal Hints

Colon Video 11

Anatomy of the Sigmoid

Post-op

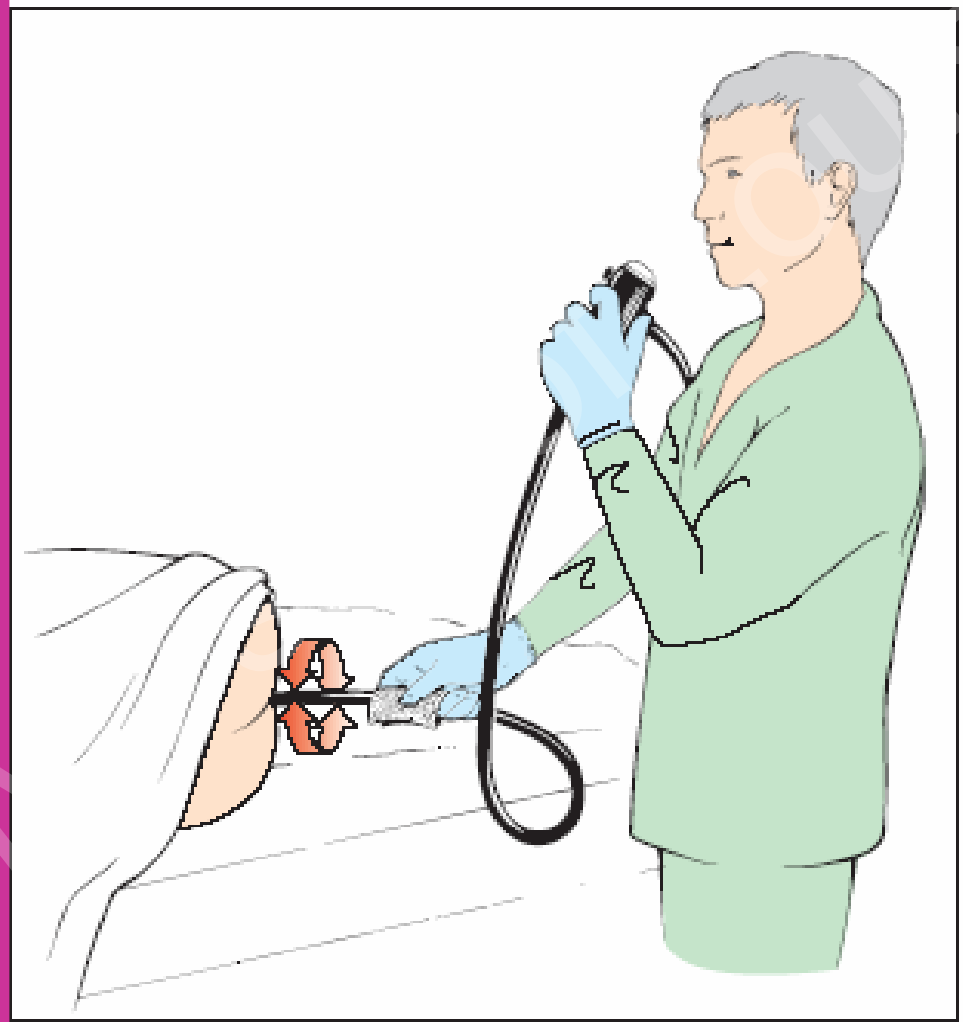
Male



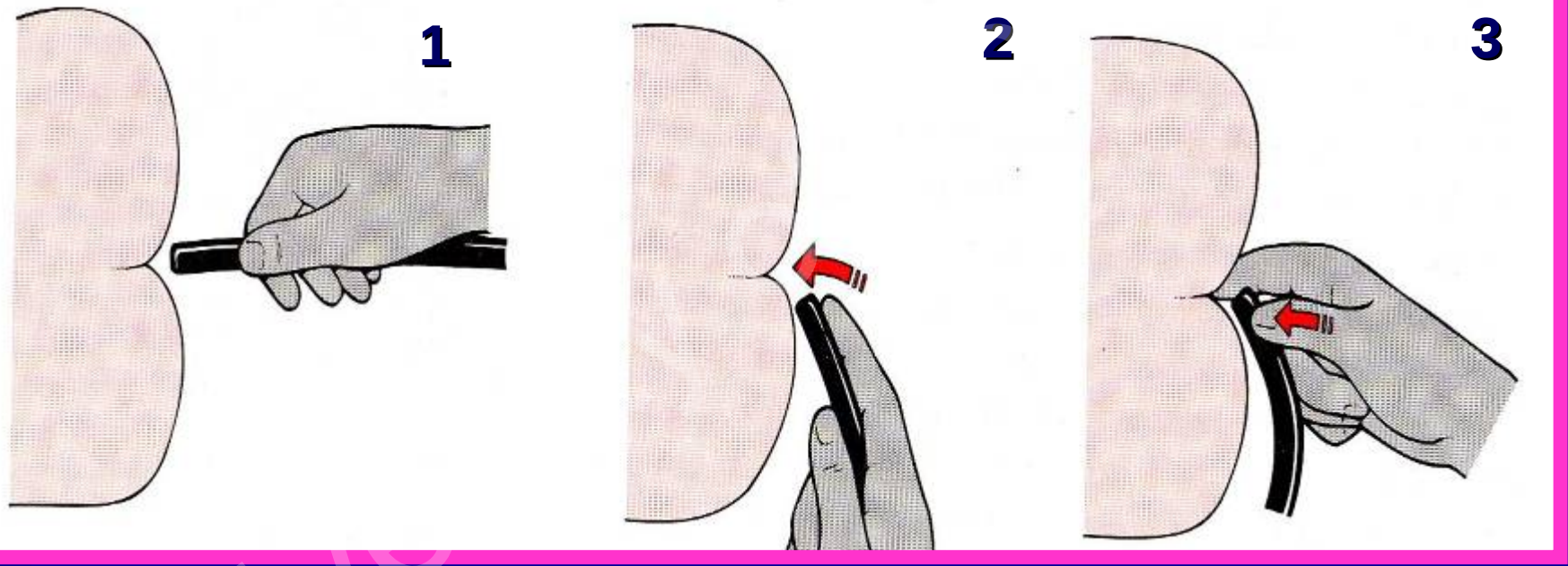
Female

Obese Female

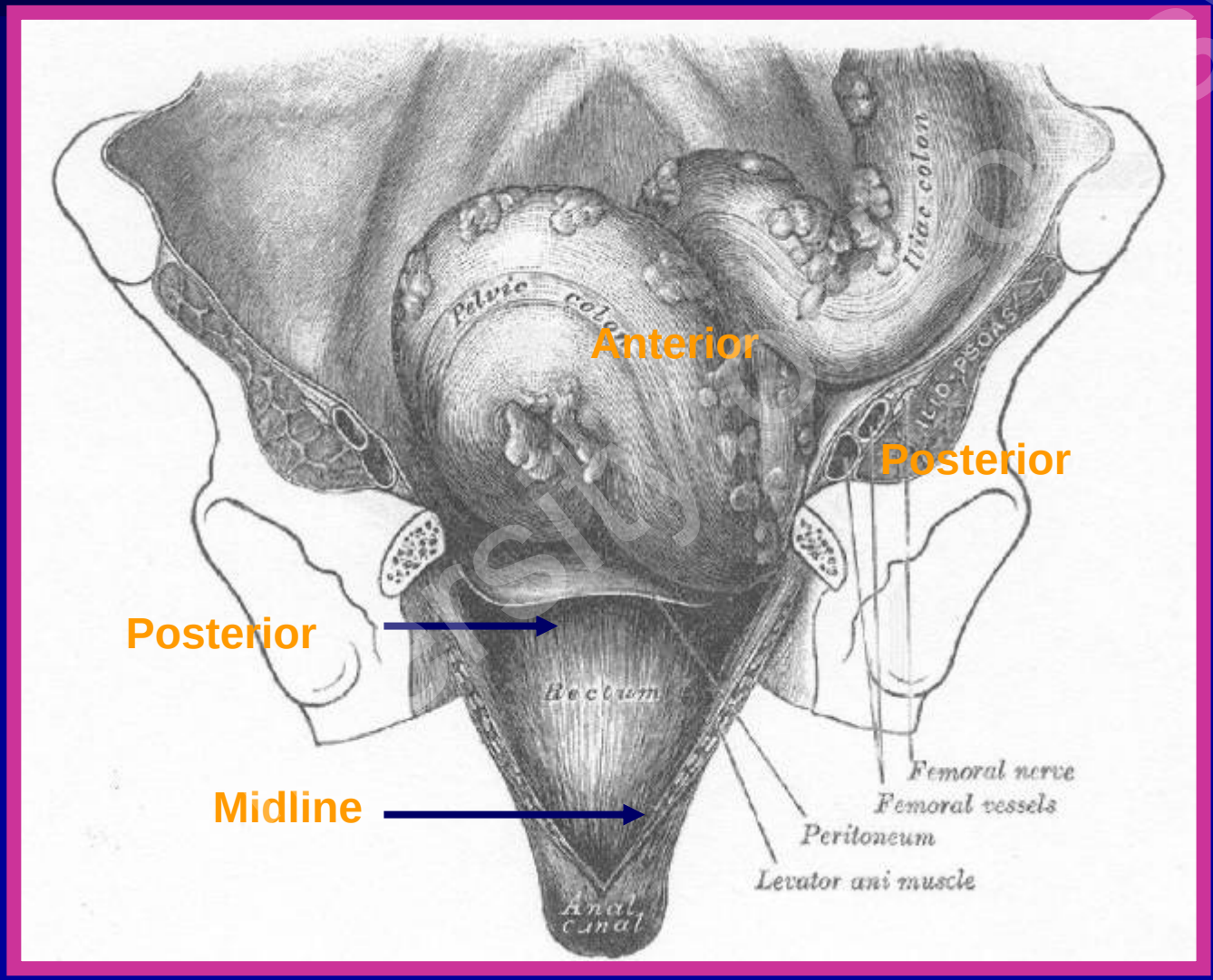
Positioning



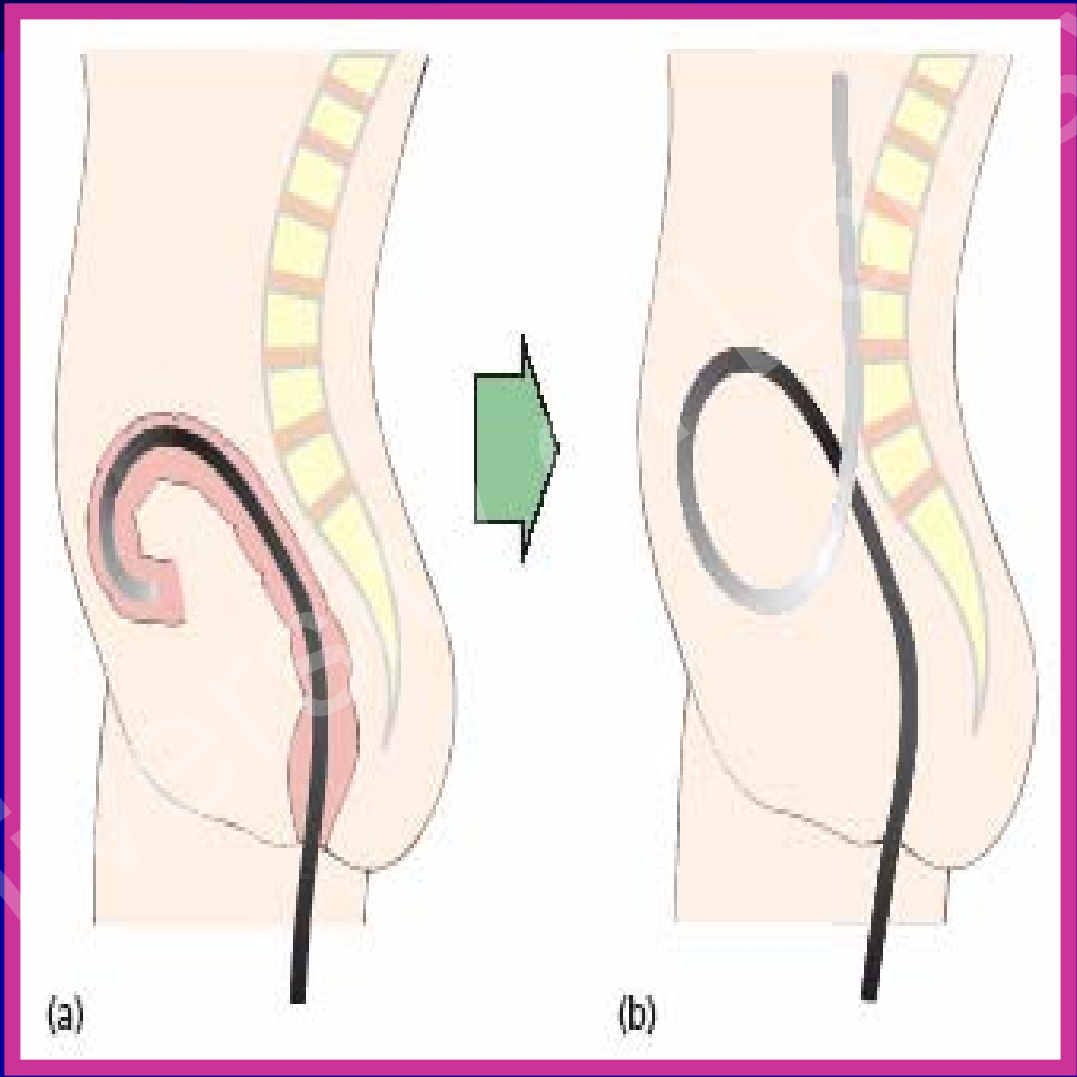
Anal Intubation



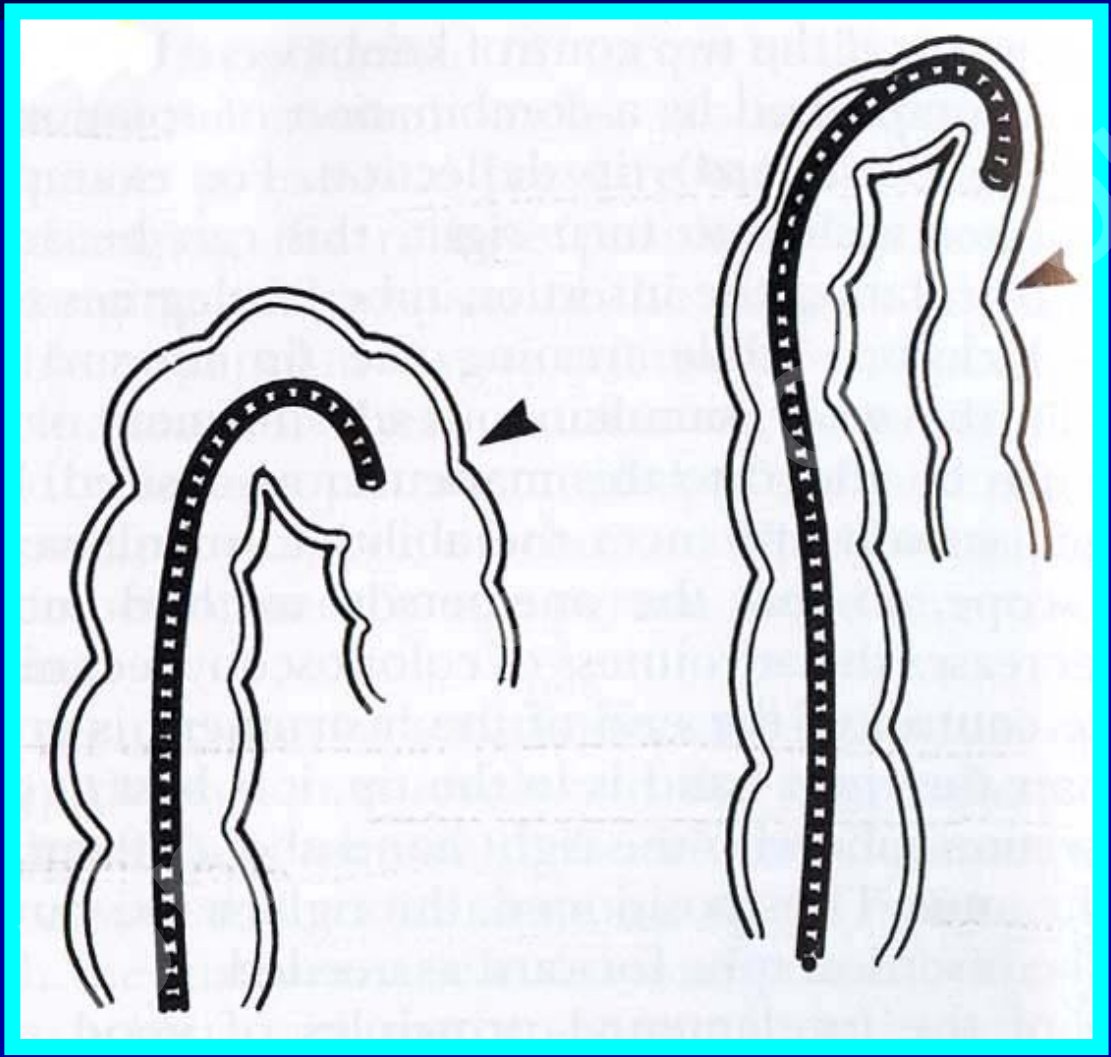
Anatomy of the Sigmoid

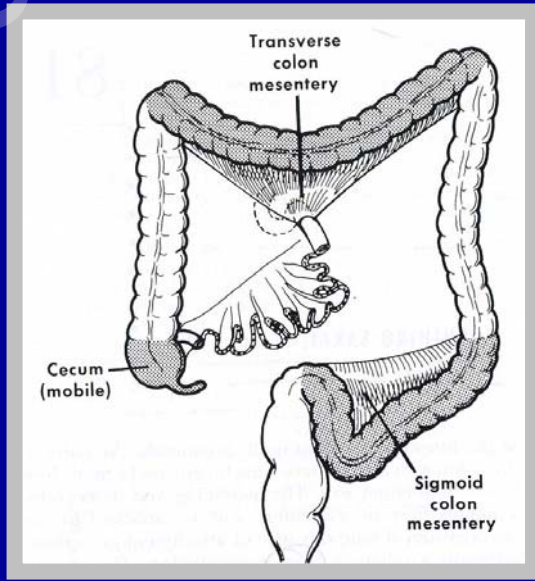


Normal Anatomy of Rectosigmoid



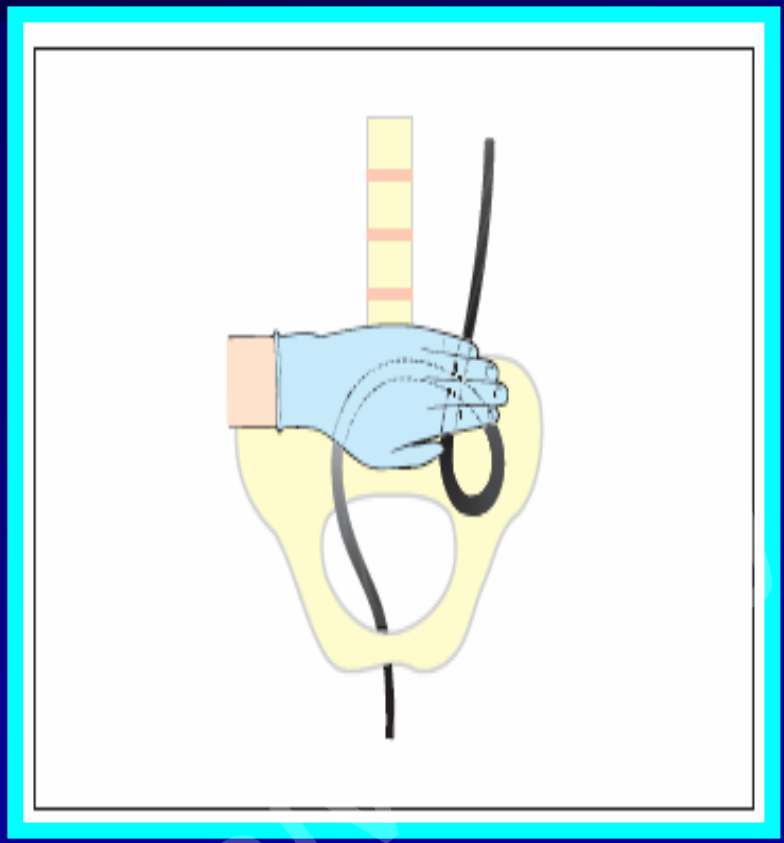
Traversing Rectosigmoid Junction





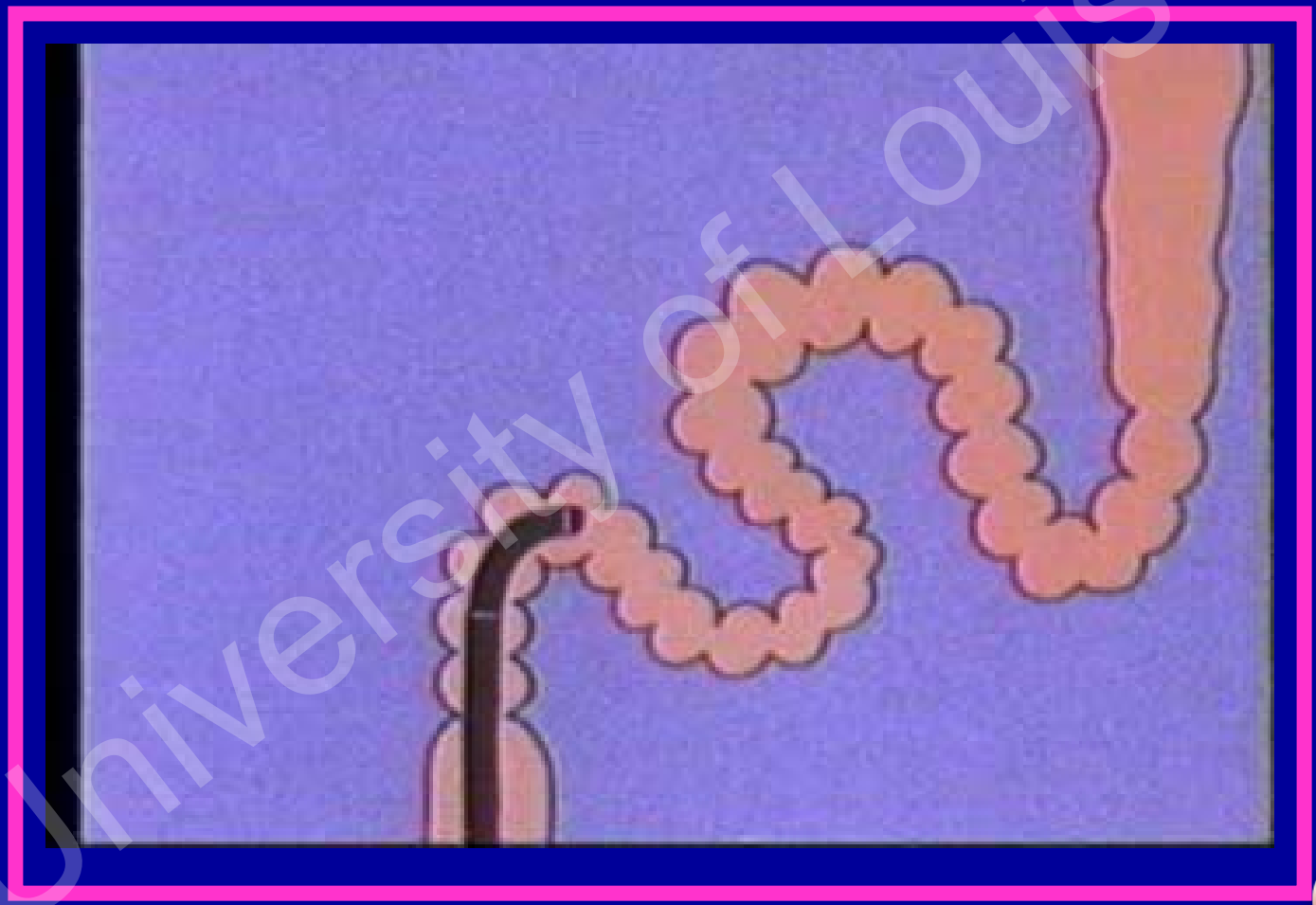
Walking Stick

Colon Video 12



Abdominal Pressure In Suprapubic Area

Video 1
Value of Straightening Scope



Pain/Resistence on Colonoscopy

Loop in shaft

- Causes pain
- Impedes further intubation
  - Push with a loop = bigger loop
- Always tends to form

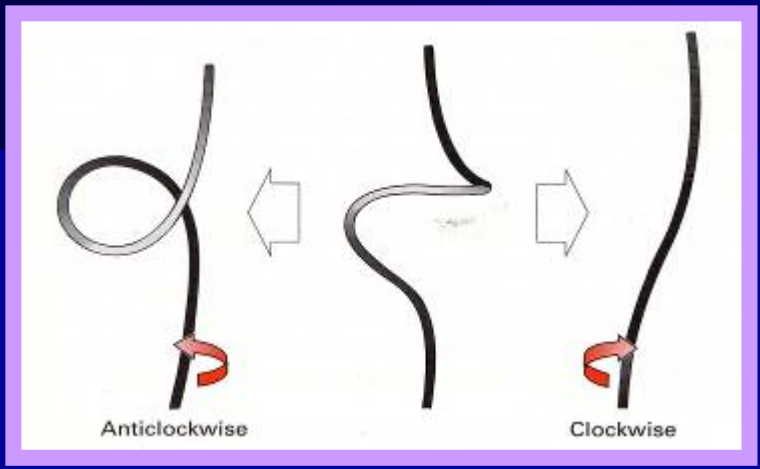
There is only one way to remove a loop:

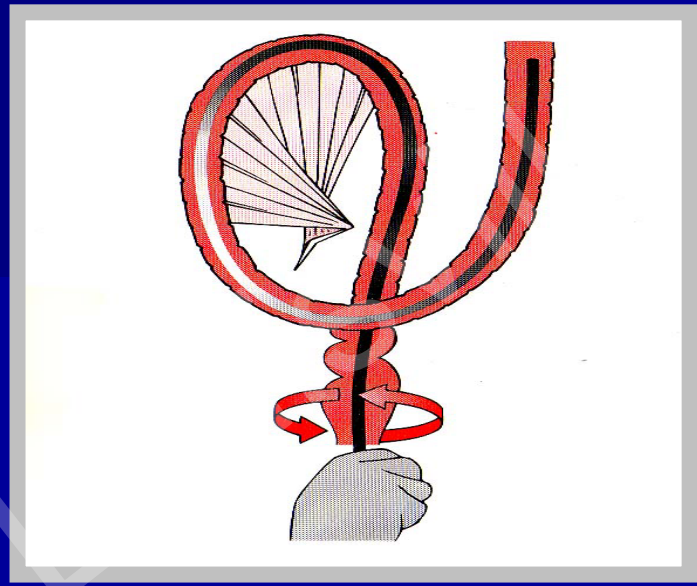
Pull back

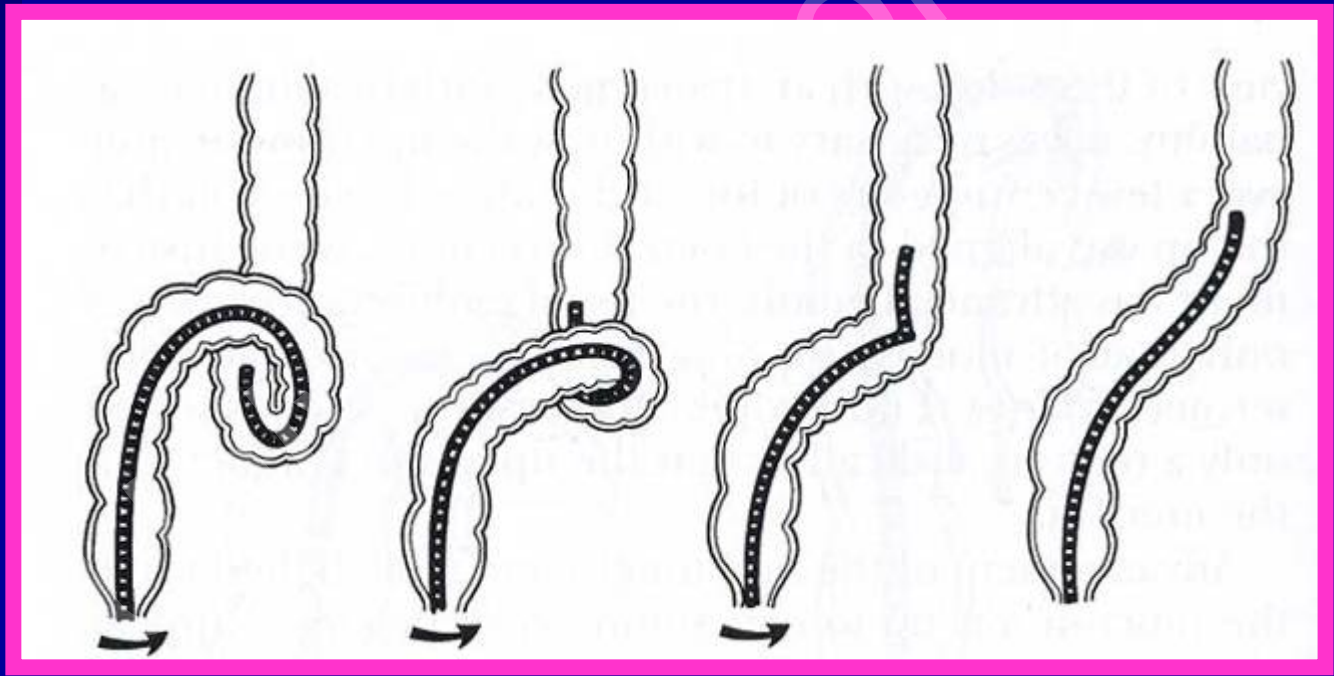
Pulling Back the Shaft…

- Removes loops
- Changes vector forces from loop to straight
- Decreases patient discomfort
- Permits tip deflection when controls are maximally deflected and further deflection is desired
- Removes tip from contact with mucosa
- Pleats colon on shaft of scope

Alpha Loop



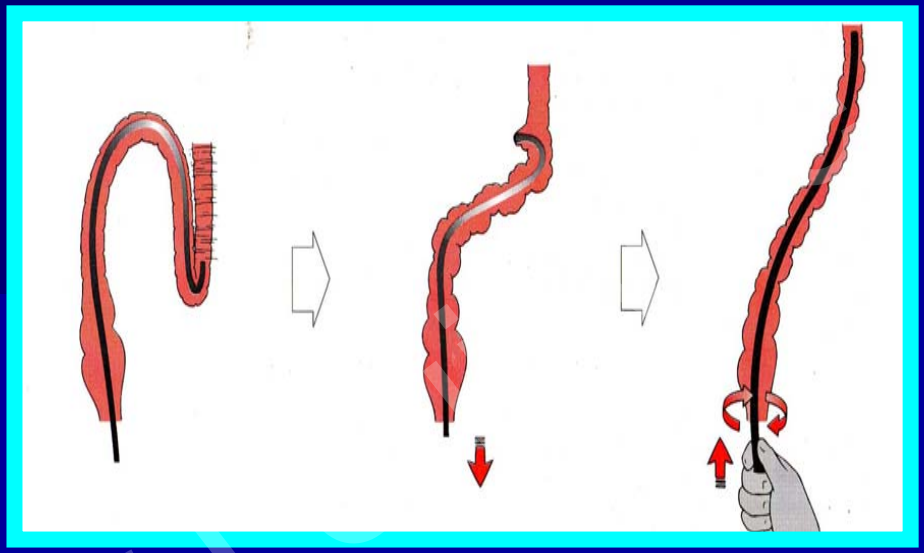


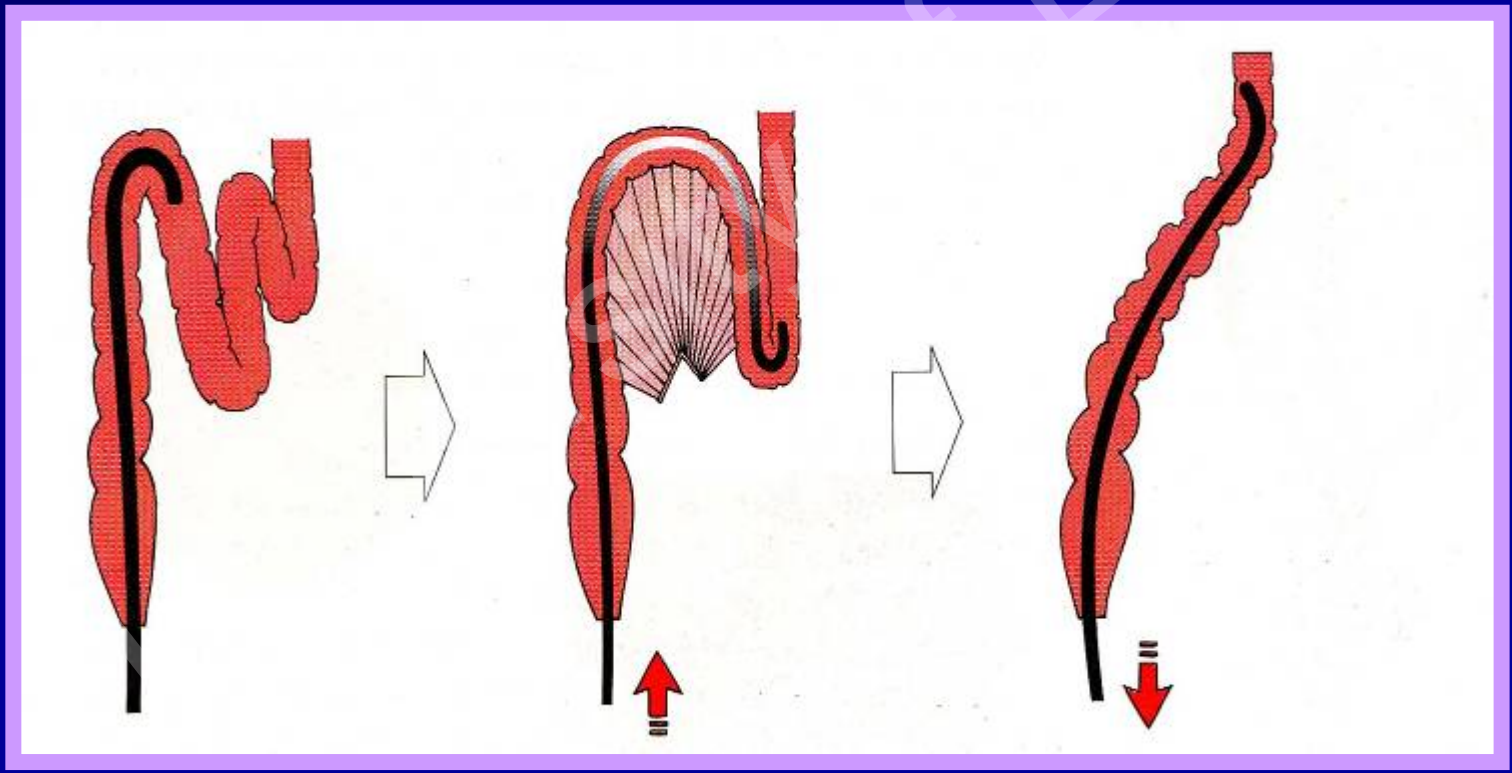


Alpha Loop

Colon Video 13

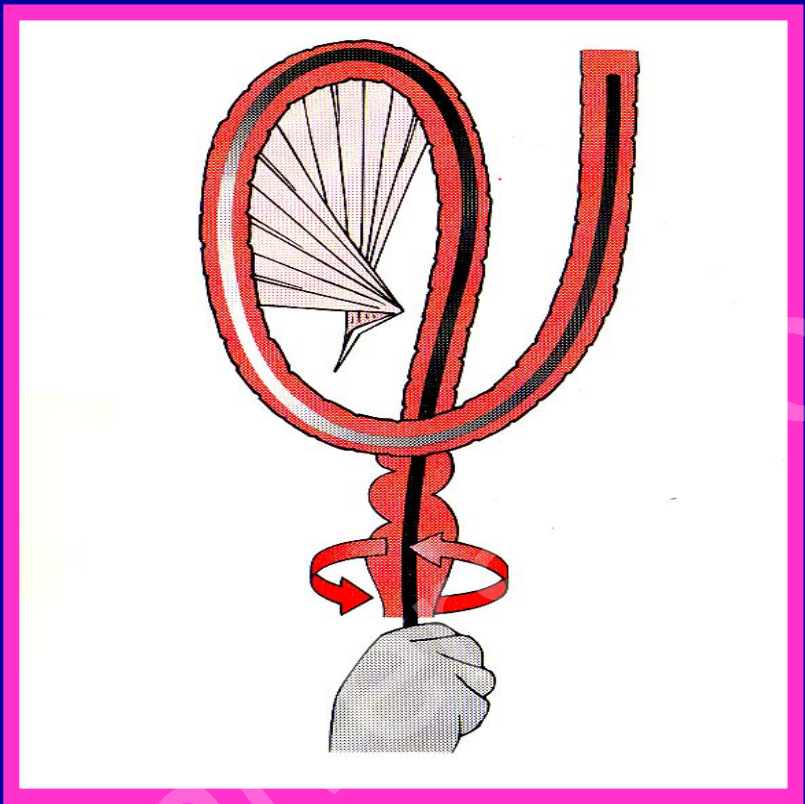
Formation of an "N" Loop



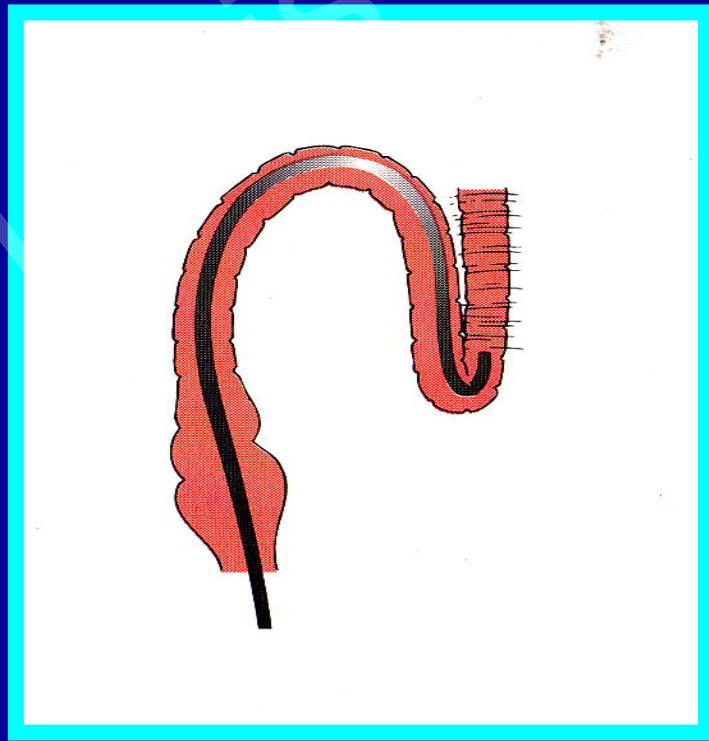


“N” Loop

Traversing Junction of Sigmoid and Descending Colon



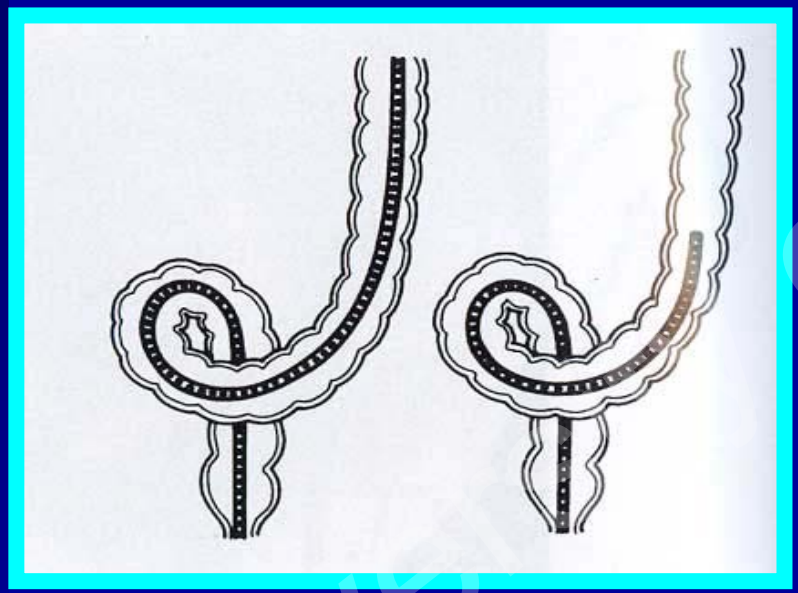
Going well, but lots of scope



Acute angle, tough going

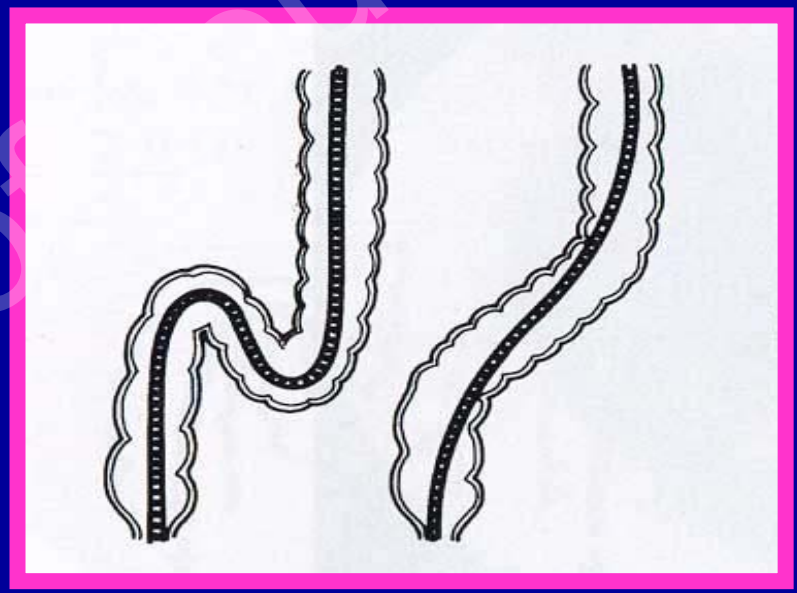
Reducing Loops

Alpha Loop



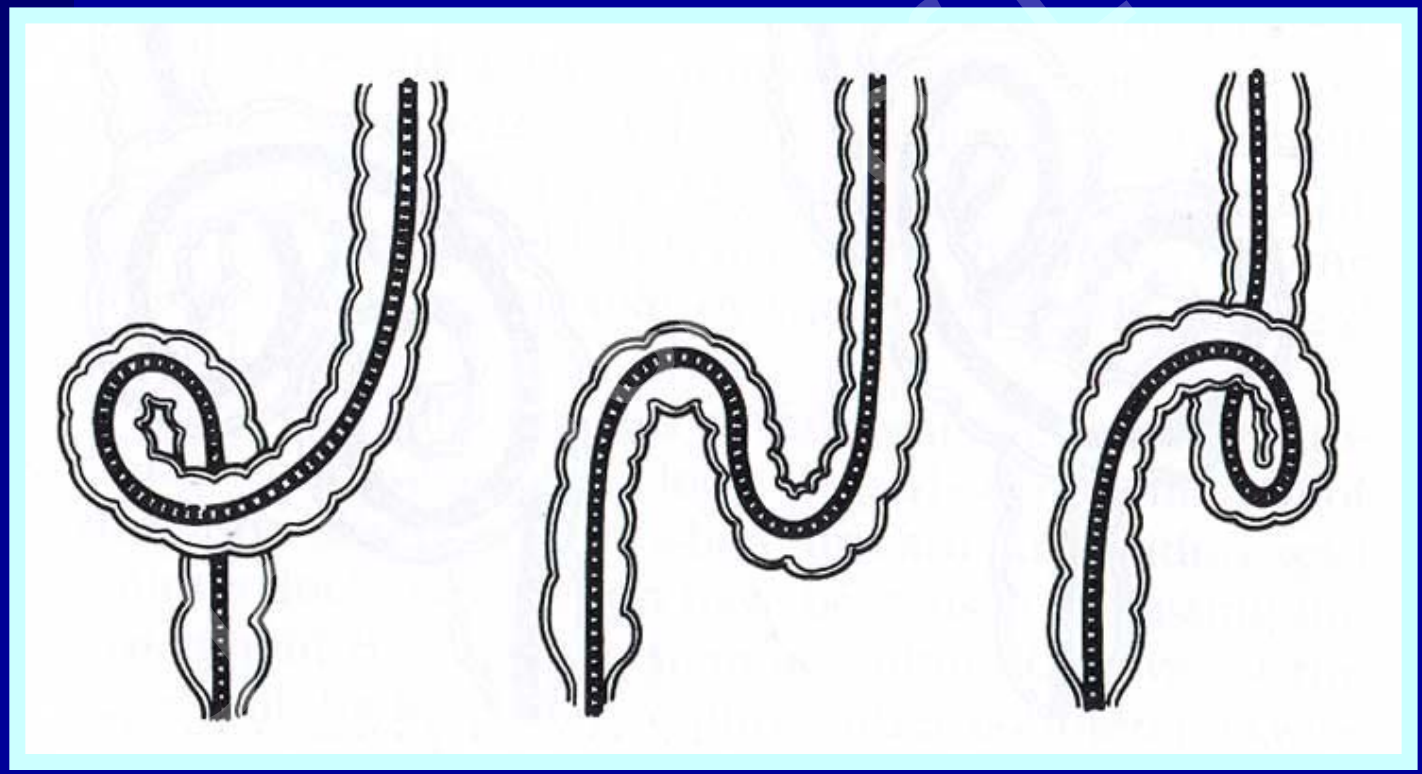
Withdrawal with clockwise rotation

"N" Loop

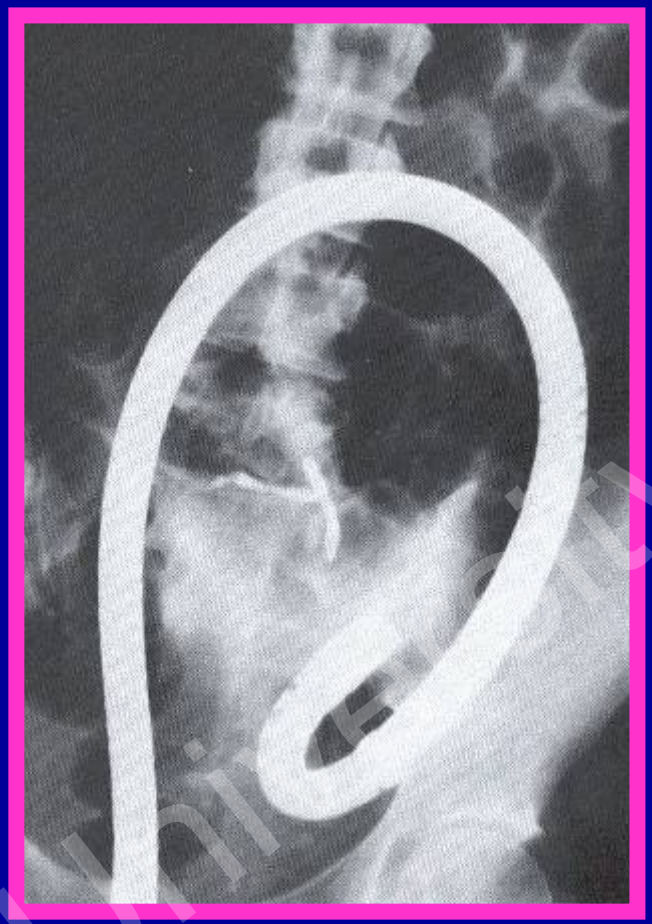


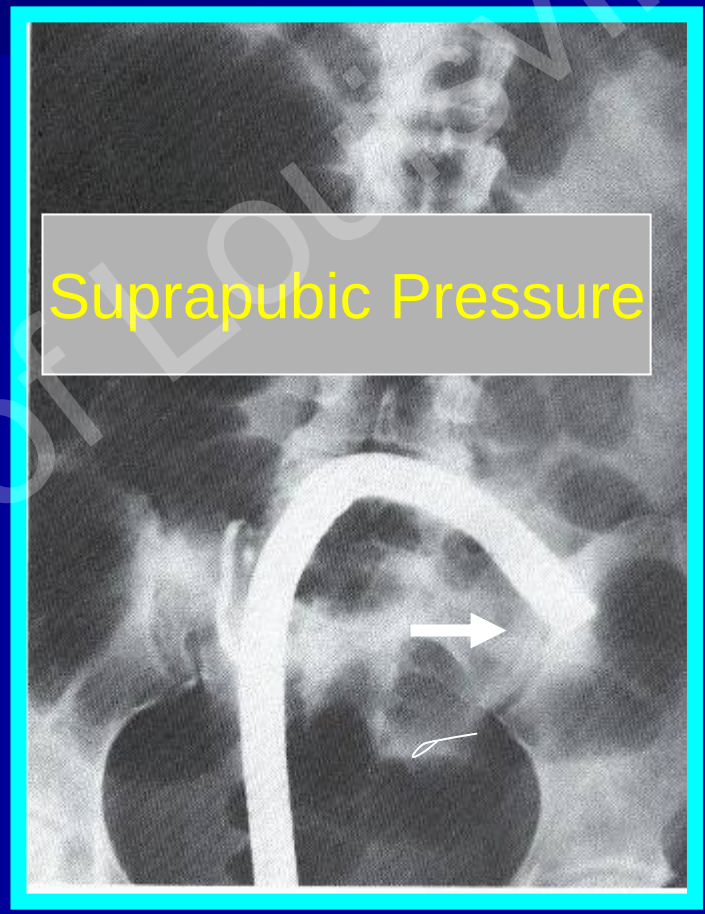
Withdrawal without clockwise rotation

Loops Involving Sigmoid Colon



Abdominal Pressure





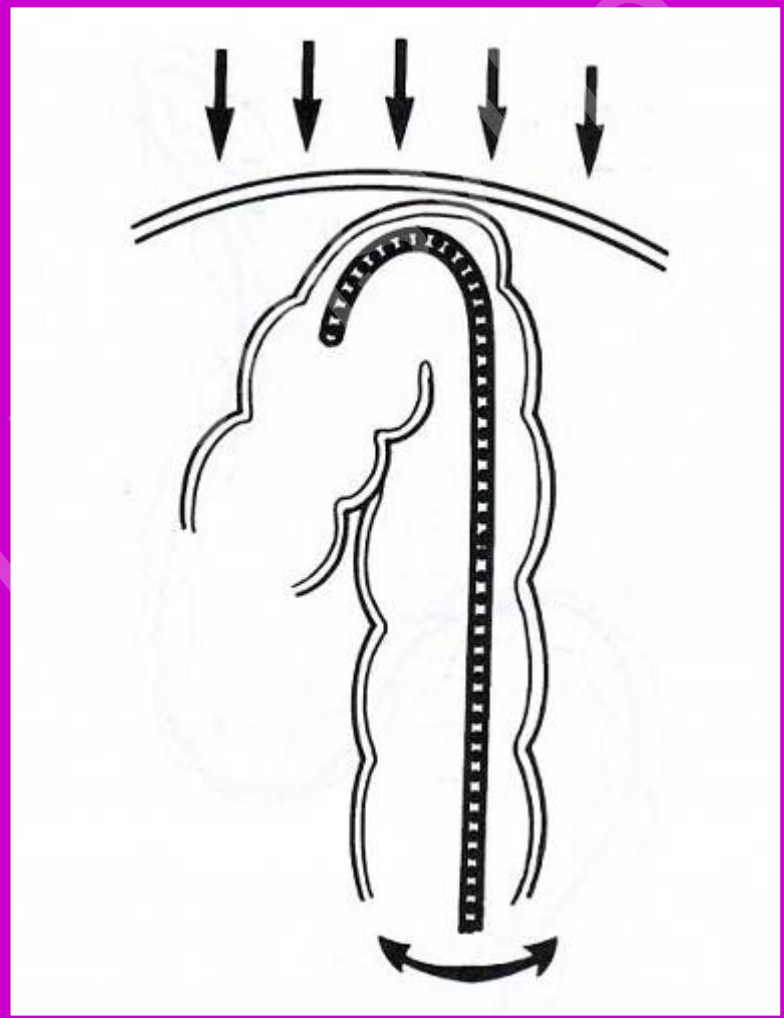
Force Vector = white arrow

Abdominal Pressure

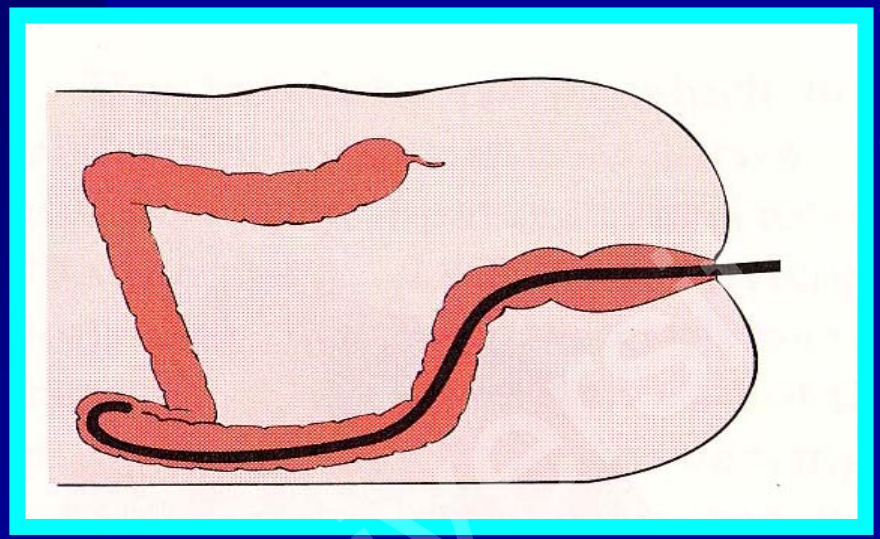
TIP LOCATION	PRESSURE AREA
20-25 cm	suprapubic
25-35 cm	left lower quadrant
35-50 cm	left mid-abdomen
hepatic flexure	splenic flexure (sandwich)

Splenic Flexure

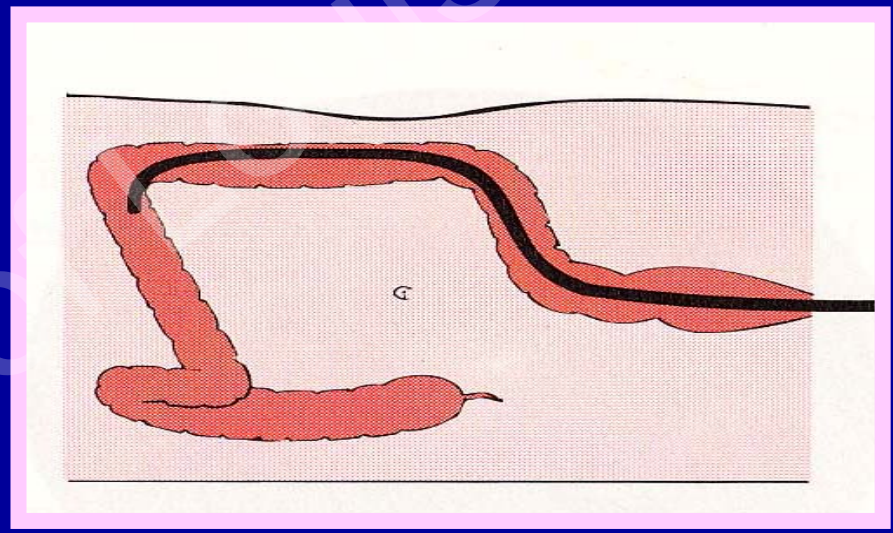
- Fluid filled area
- Represents half time point in colonoscopy
- Scope should be 50cm from anus if straight
- If straight scope only few minutes to cecum



Repositioning to Traverse Splenic Flexure



Left Lateral Decubitus

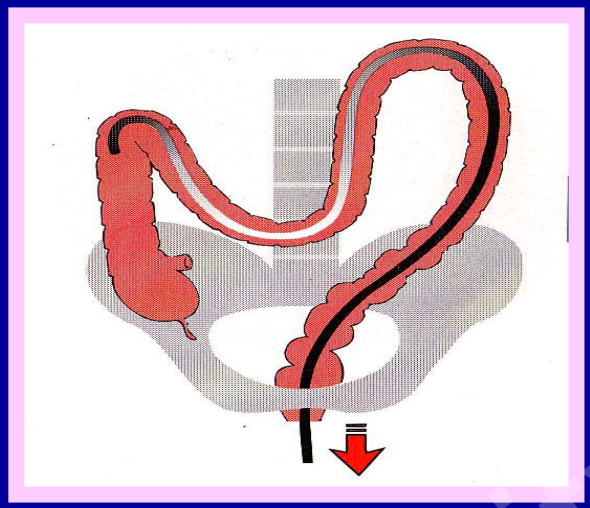


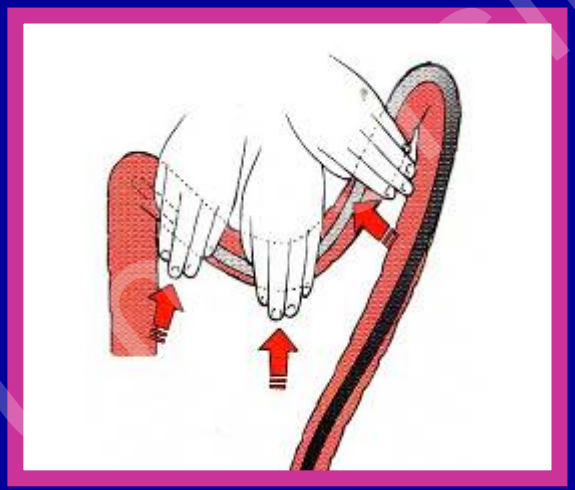
Right Lateral Decubitus

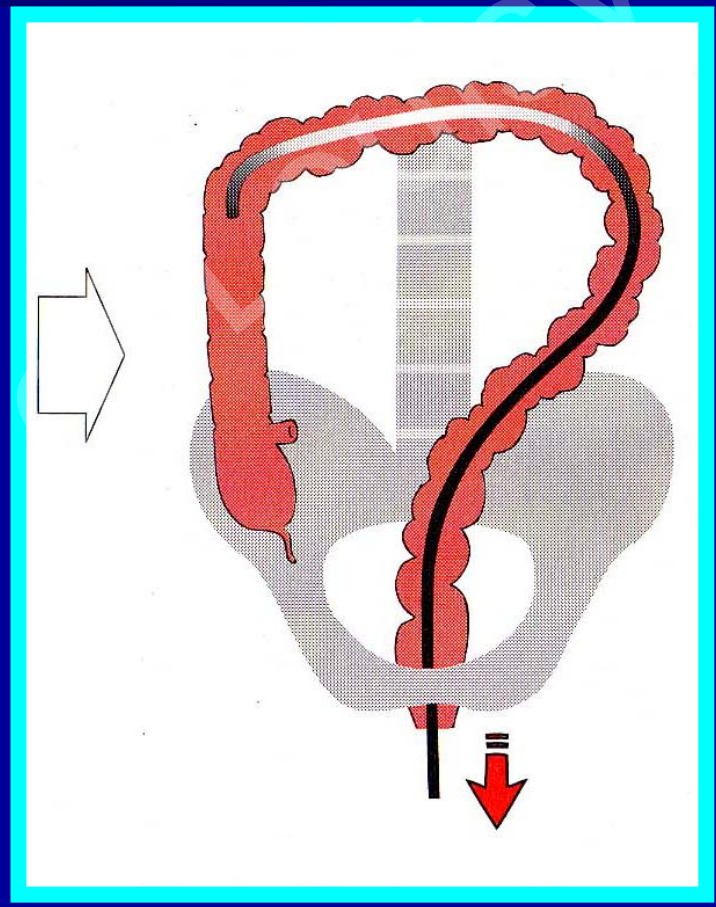
Splenic Flexure

Colon Video 15

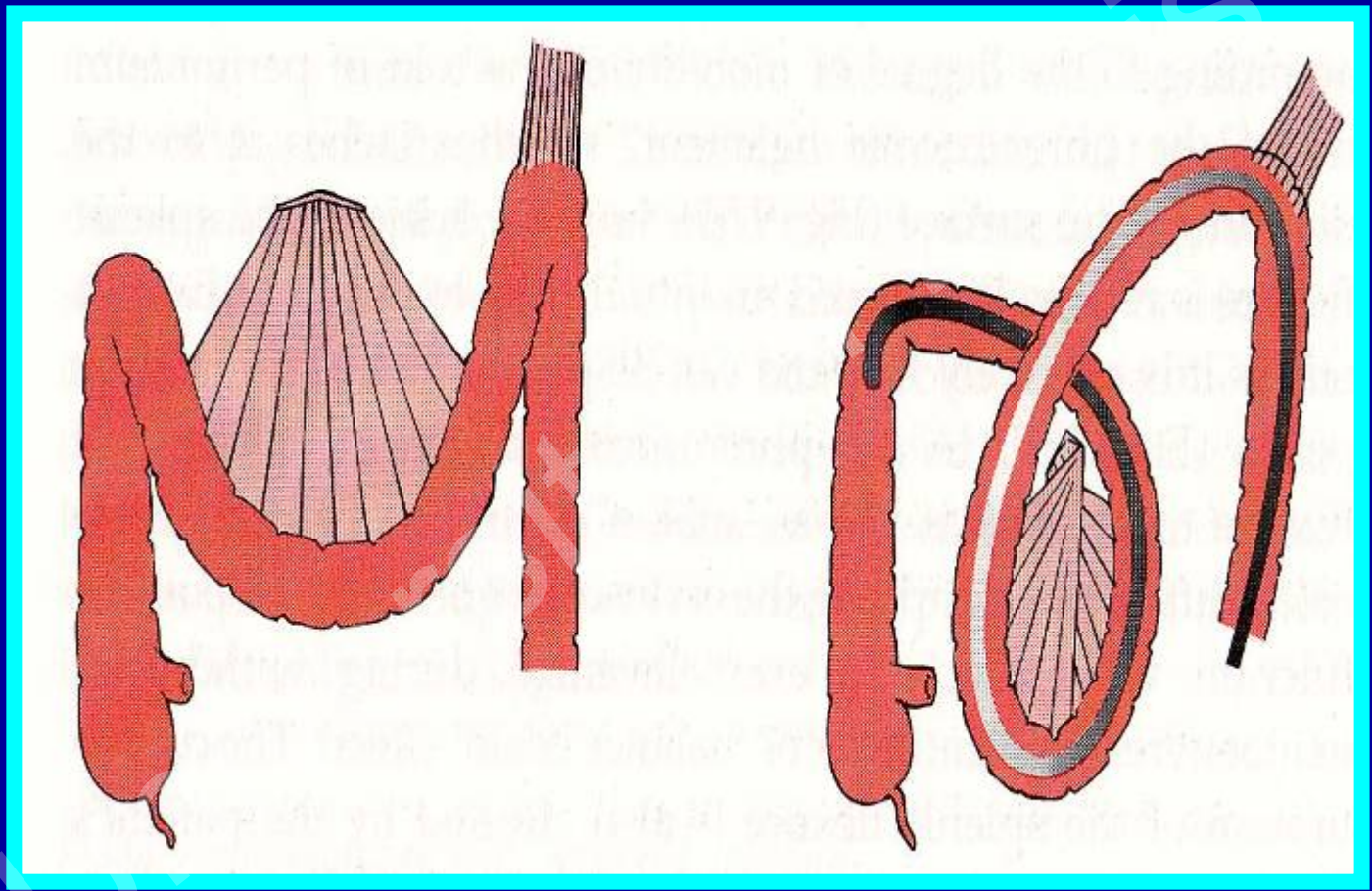
Transverse Colon and “U” Loop





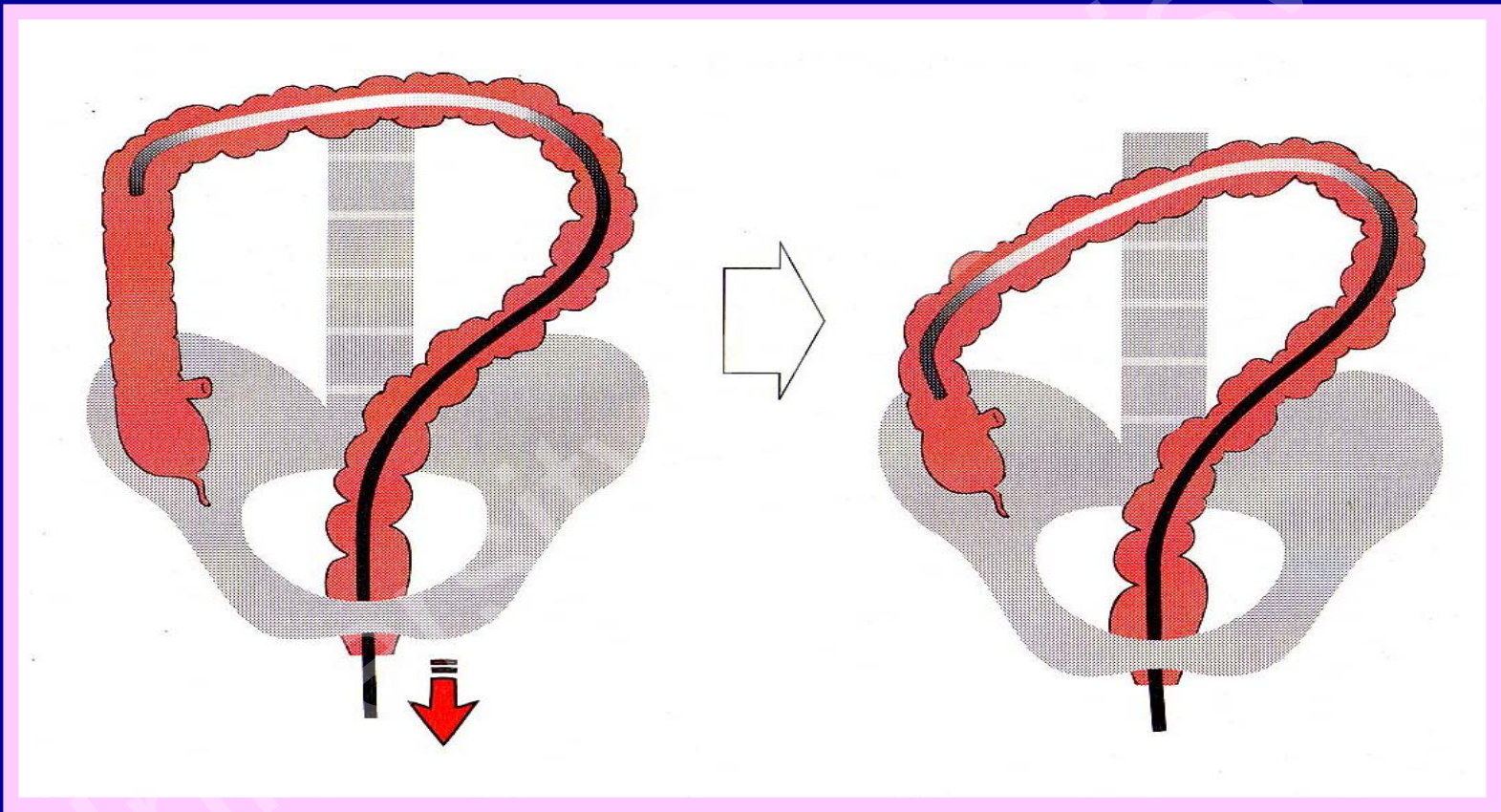


Transverse Colon and Gamma Loop

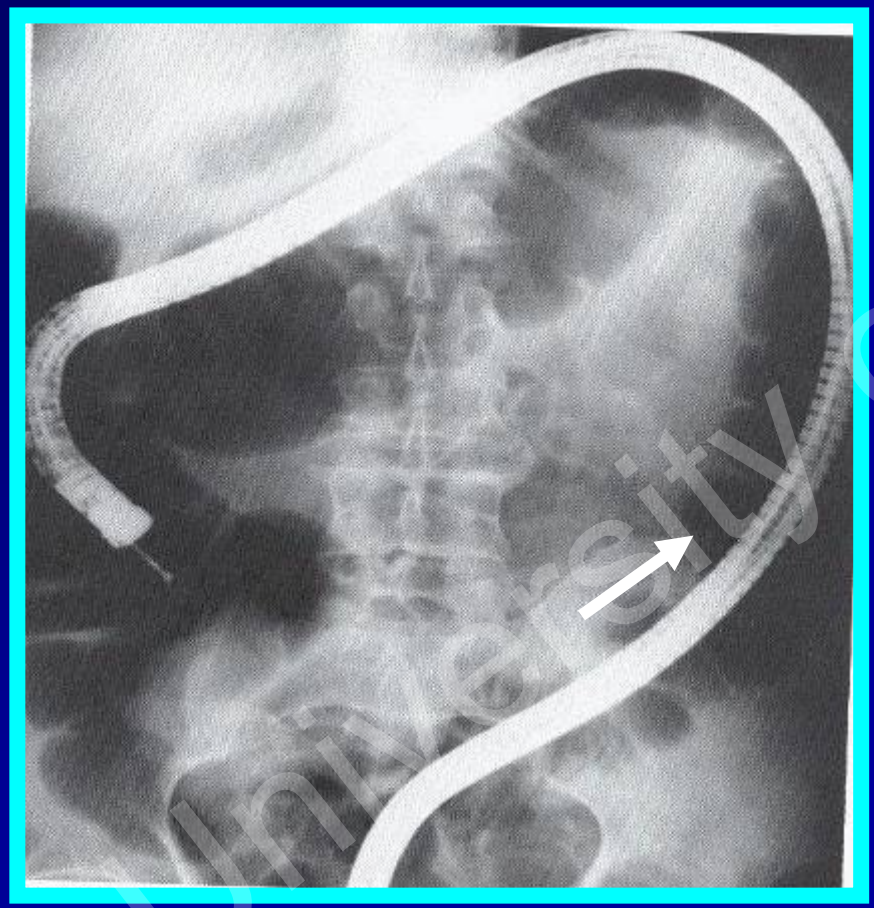


Transverse “U” and Gamma Loops

Ascending Colon and Cecum

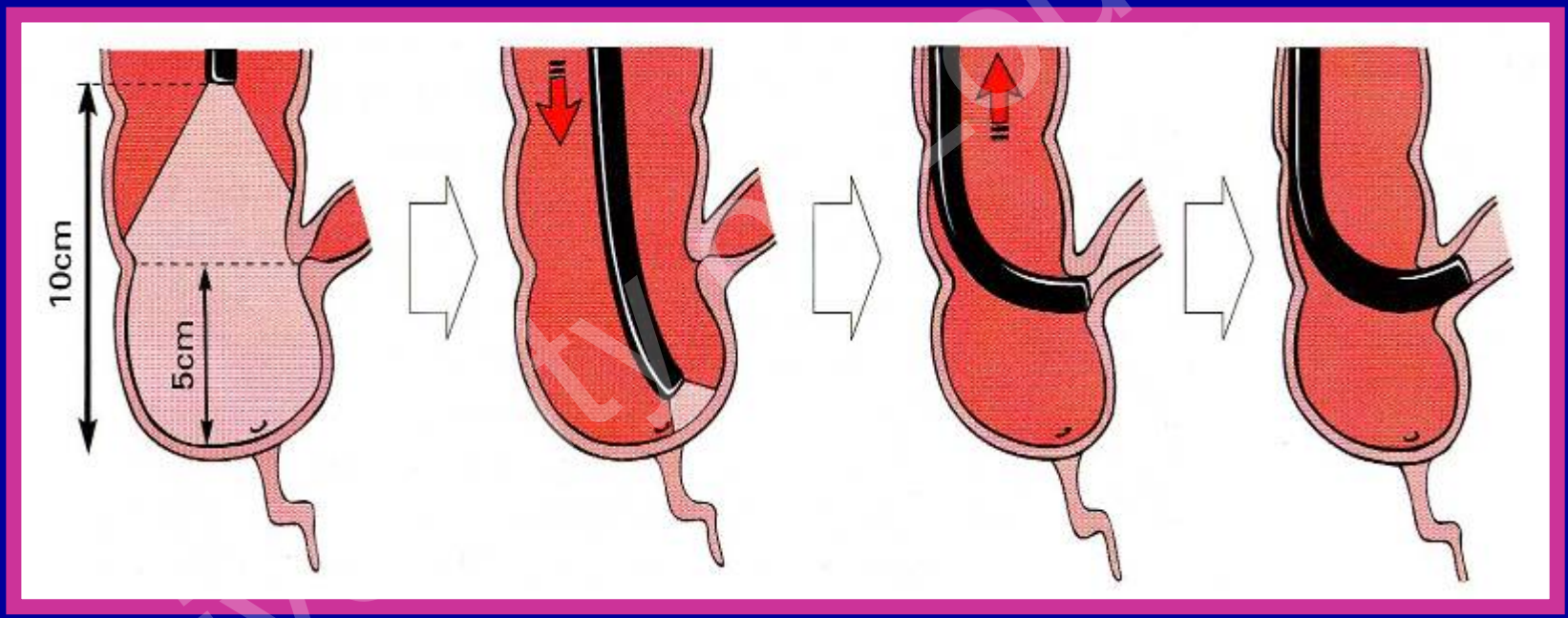


Straighten the Colonoscope



- The force vector aligns with the shaft when scope is straight
- Sigmoid configuration always tends to loop
- Advance requires multiple attempts at straightening

Intubation of Terminal Ileum

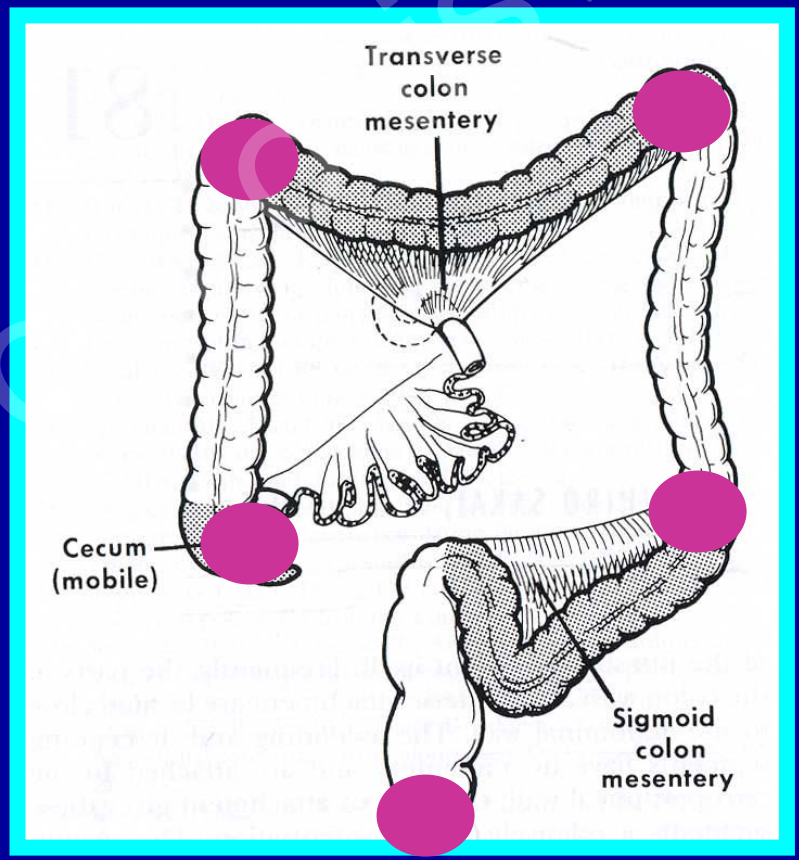


Intubating Terminal Ileum

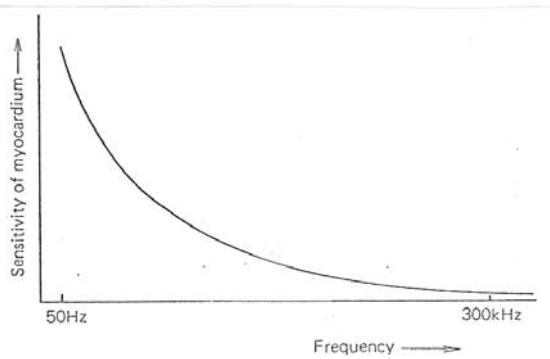
Colon Video 17

Withdrawal of Scope

- View coming out
- Take 10-15 min
- Watch blind spots



Electrocautery



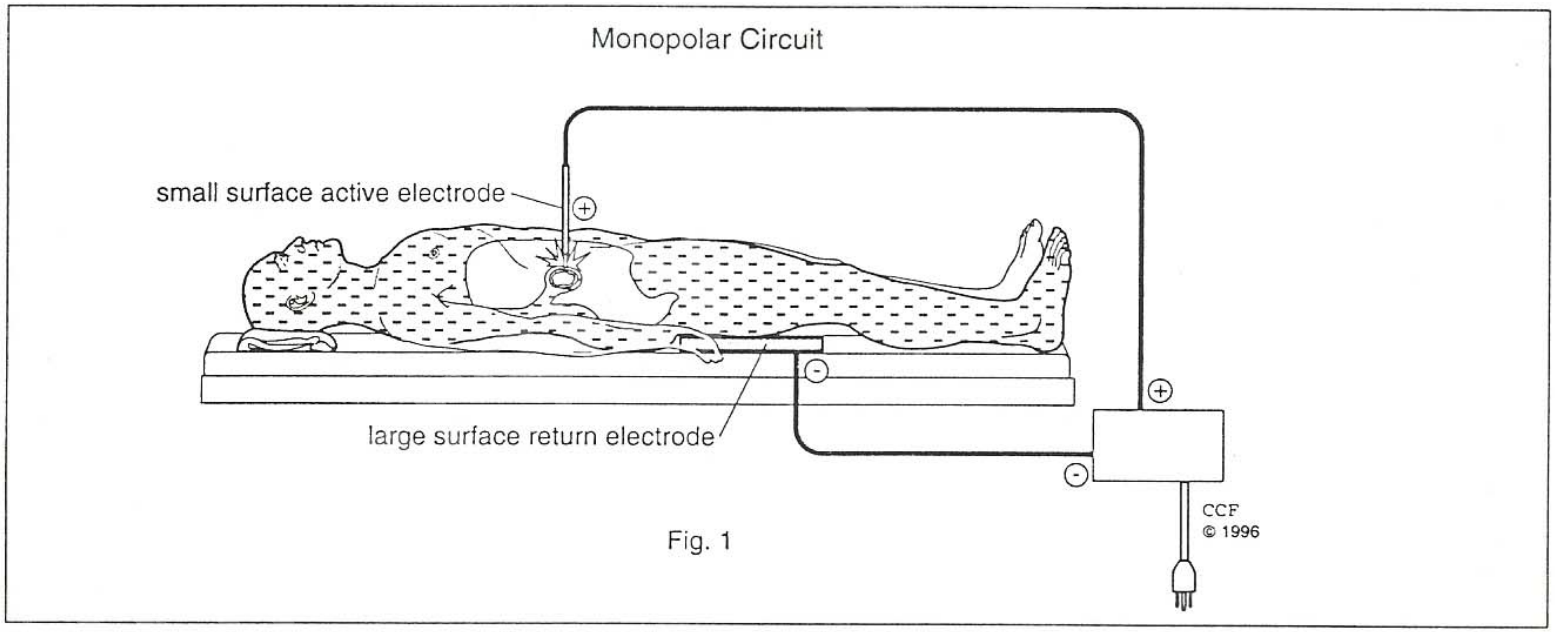
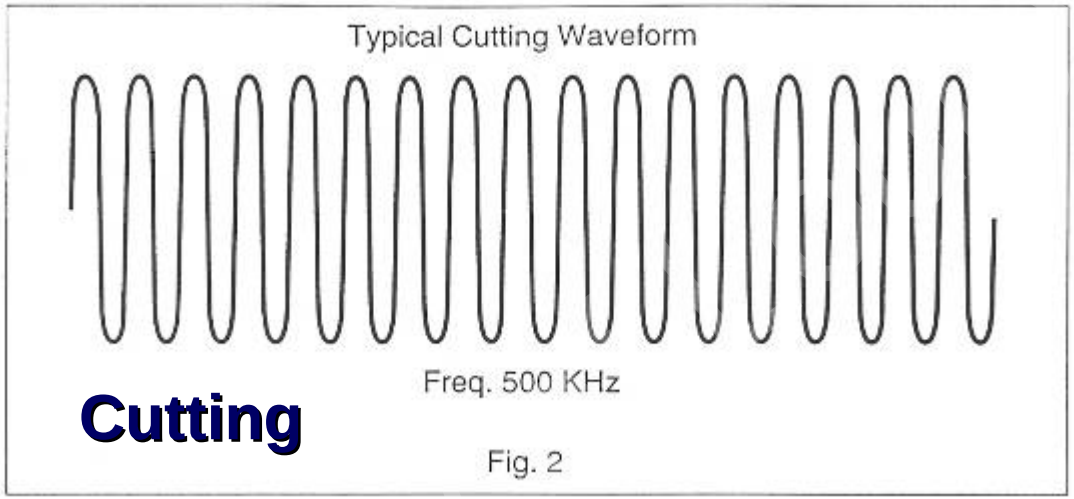


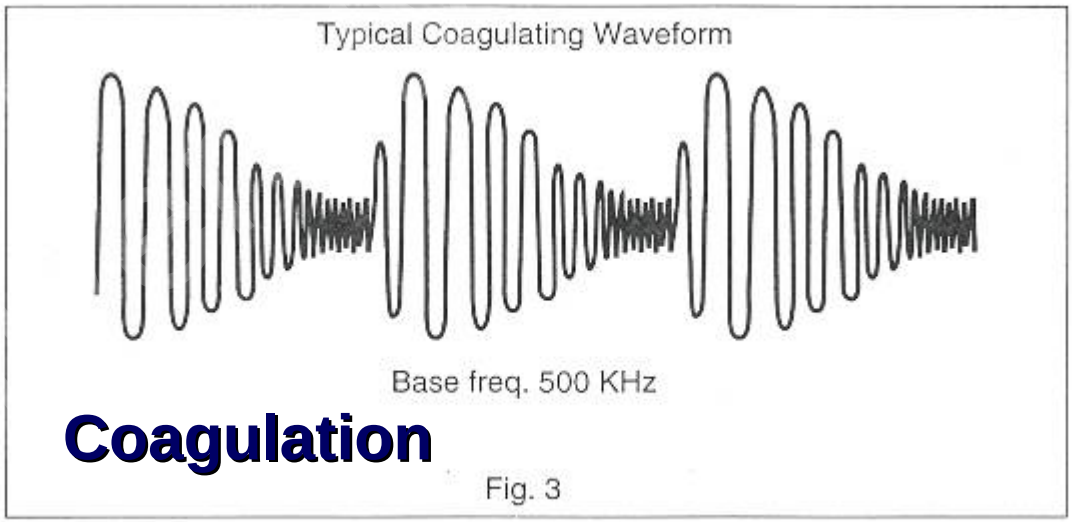
Fig. 1

Principles of Electrocautery



Cutting

Fig. 2



Coagulation

Fig. 3

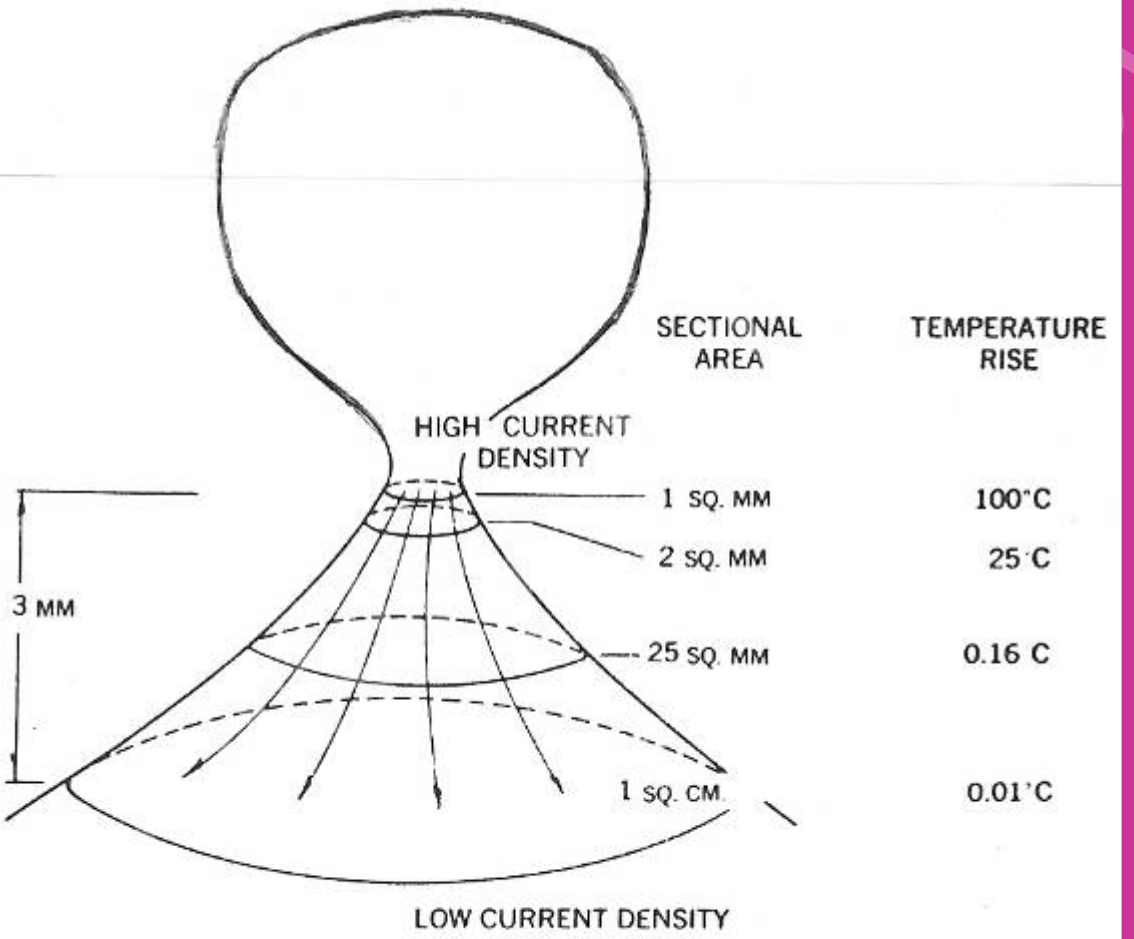
Principles of Electrocautery

$$P = I^2 R$$

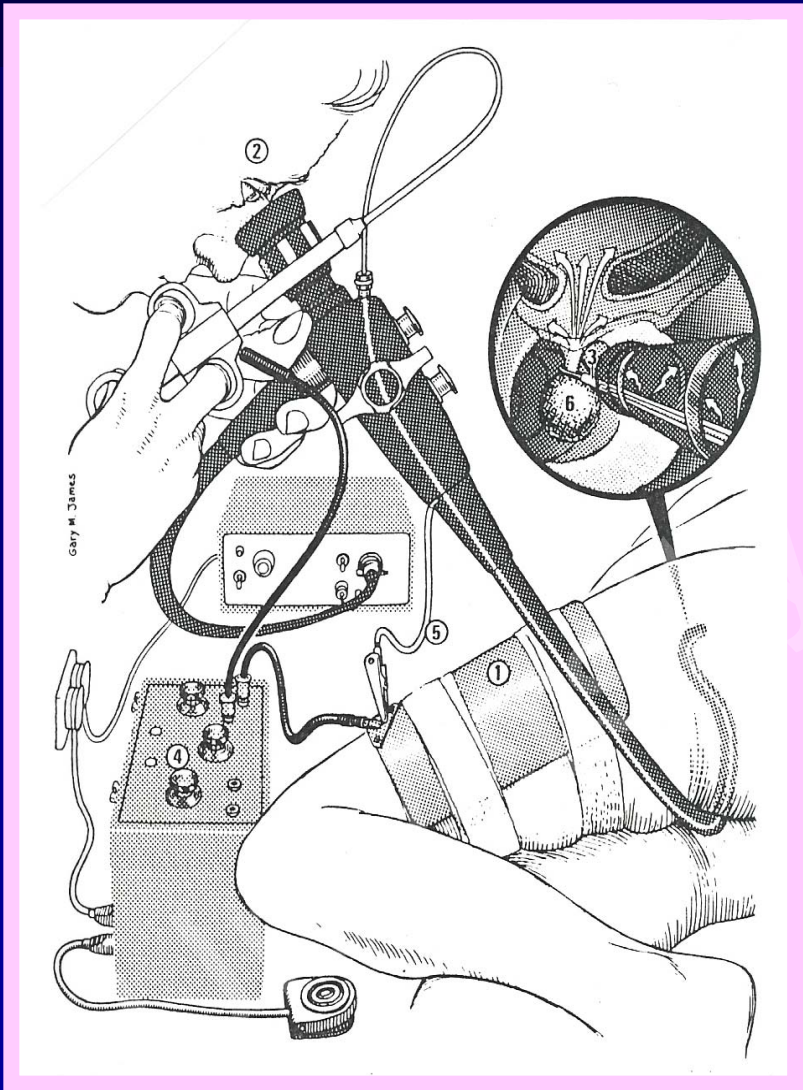
$$C = \frac{I}{A}$$

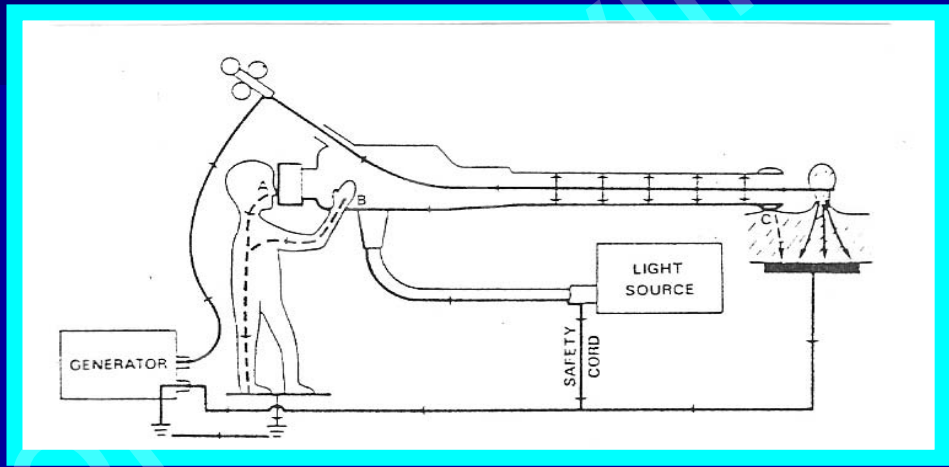
P = power, I = current, R = resistence,
C = current density, A = area

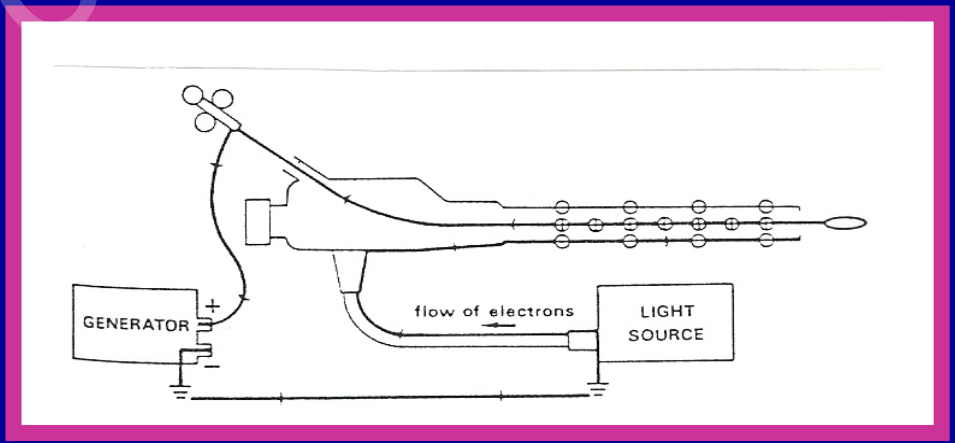
Concept of Current Density



Principles of Electrocautery







Electrocautery / Polypectomy

Air

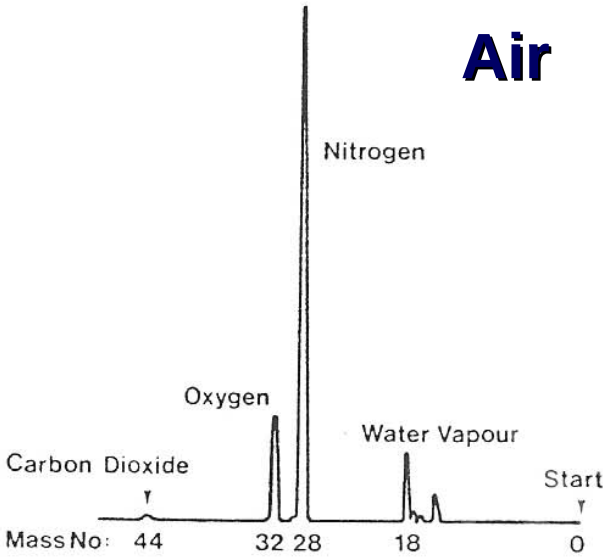


Figure 1. Mass spectrometer tracing of air.

Colon Gas

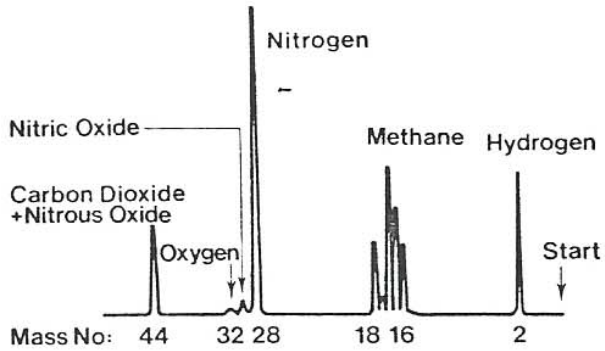


Figure 2. Mass spectrometer tracing of typical colonic gas sample.

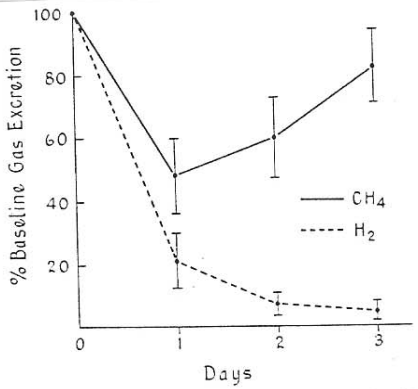


FIG. 2. Effect of a low residue, liquid diet on pulmonary excretion of H_2 and CH_4 by 5 healthy subjects.

Clear Liquids

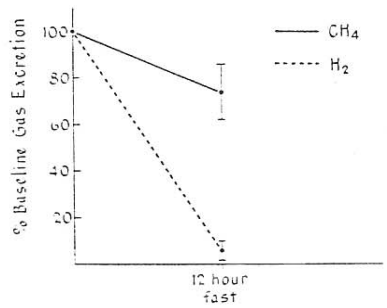


FIG. 3. Effect of a 12-hr fast on pulmonary excretion of H_2 and CH_4 by 10 healthy subjects.

Overnight Fast

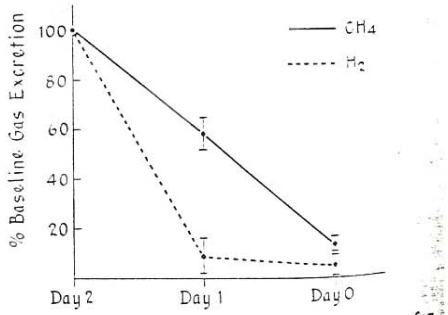


FIG. 1. Effect of the preparation procedure for colonoscopy on pulmonary excretion of H_2 and CH_4 by 10 patients.

Prep Procedure

Explosion of hydrogen gas in the colon during proctosigmoidoscopy

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Michael Levy, MD
Michael D. Levitt, MD
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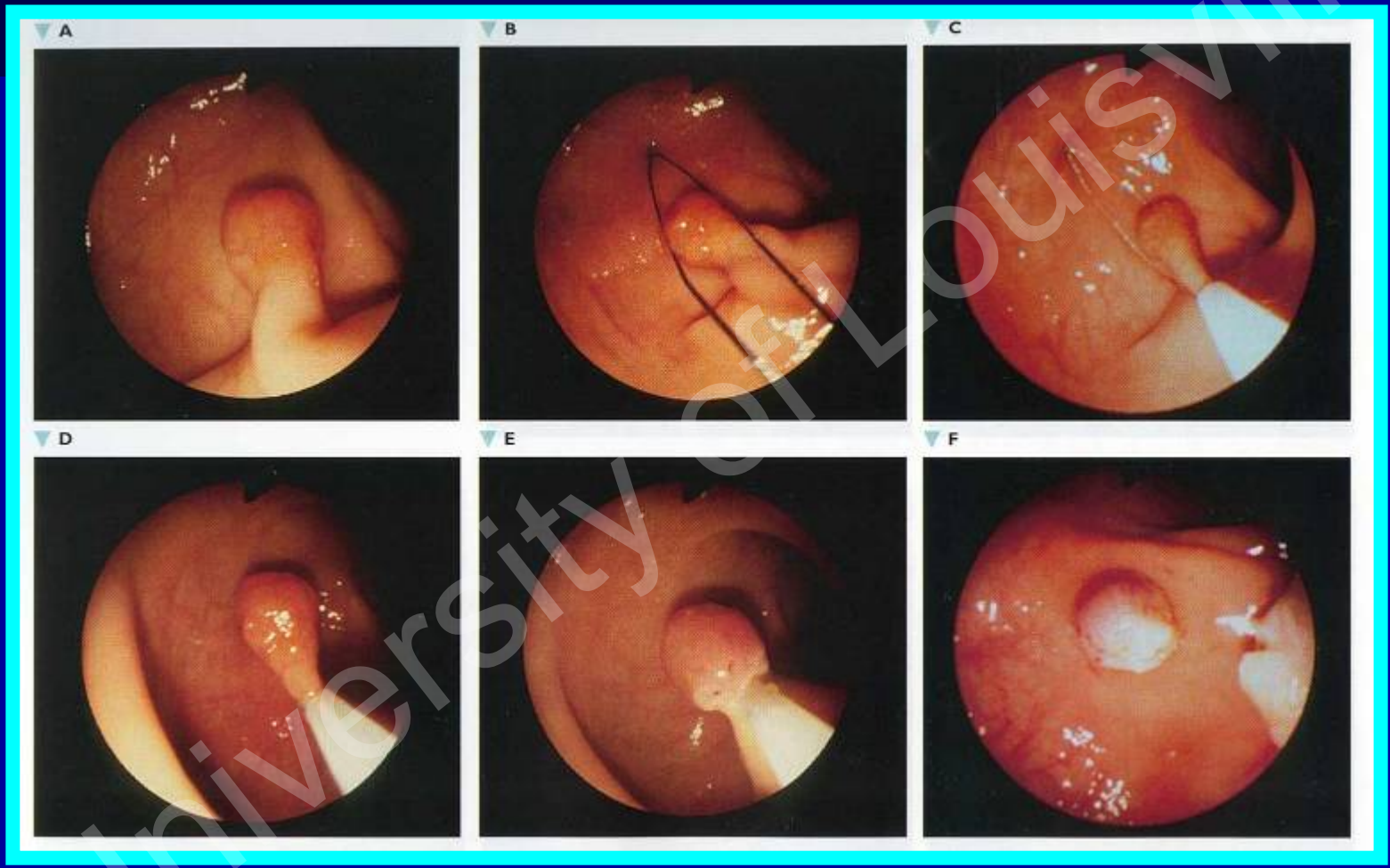
St. Louis Park Medical Center
and the University of Minnesota Hospitals
Minneapolis, Minnesota

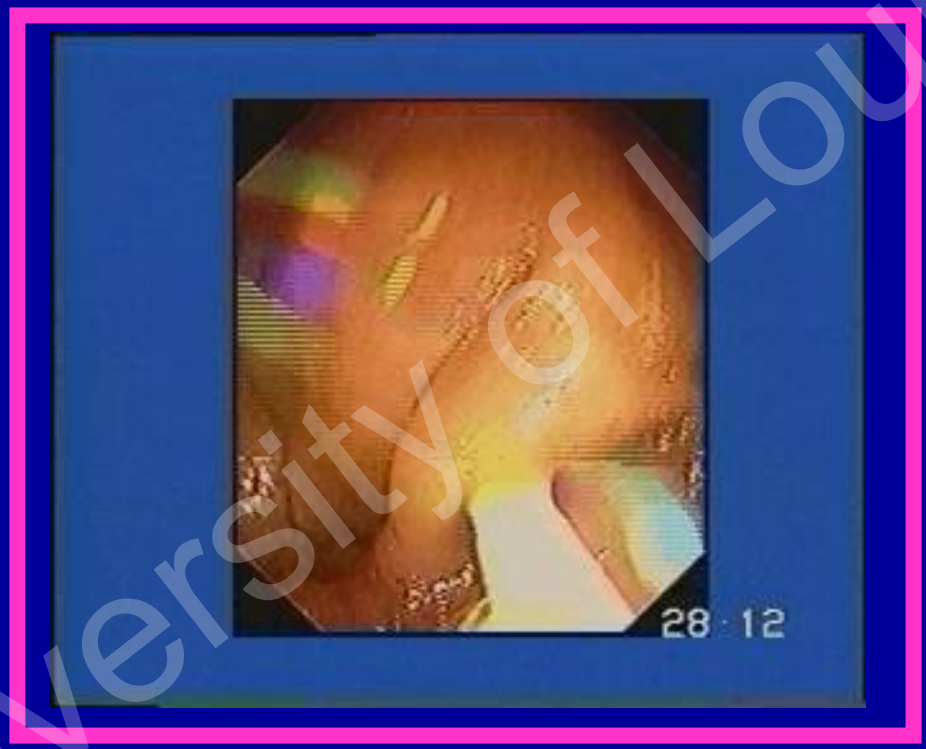
CASE REPORT A 71 year old man was referred for proctosigmoidoscopy as part of an evaluation of vague abdominal discomfort of several years' duration. The procedure was performed 2 hours after his noon meal, and he was prepared with a single sodium phosphate enema which resulted in thorough cleansing of the rectosigmoid area. With the patient in the flexed prone position, the proctosigmoidoscope was easily passed to 20 cm without use of air insufflation or suction. On withdrawing the instrument, a 4 mm sessile polyp was noted at 18 cm which we elected to fulgurate using a standard blunt cautery electrode. With the cautery tip in contact with the lesion, the cautery machine was activated and there was an immediate, loud explosion. The patient's head and chest were pushed into the cushion of the examining table, and the examiner and assistant were thrown backward by the concussion. The patient felt no pain, and looking backward at the examiner who was standing with his arms raised in the air, he exclaimed, "You know, a doctor could get hurt doing that!"

Simple Polypectomy

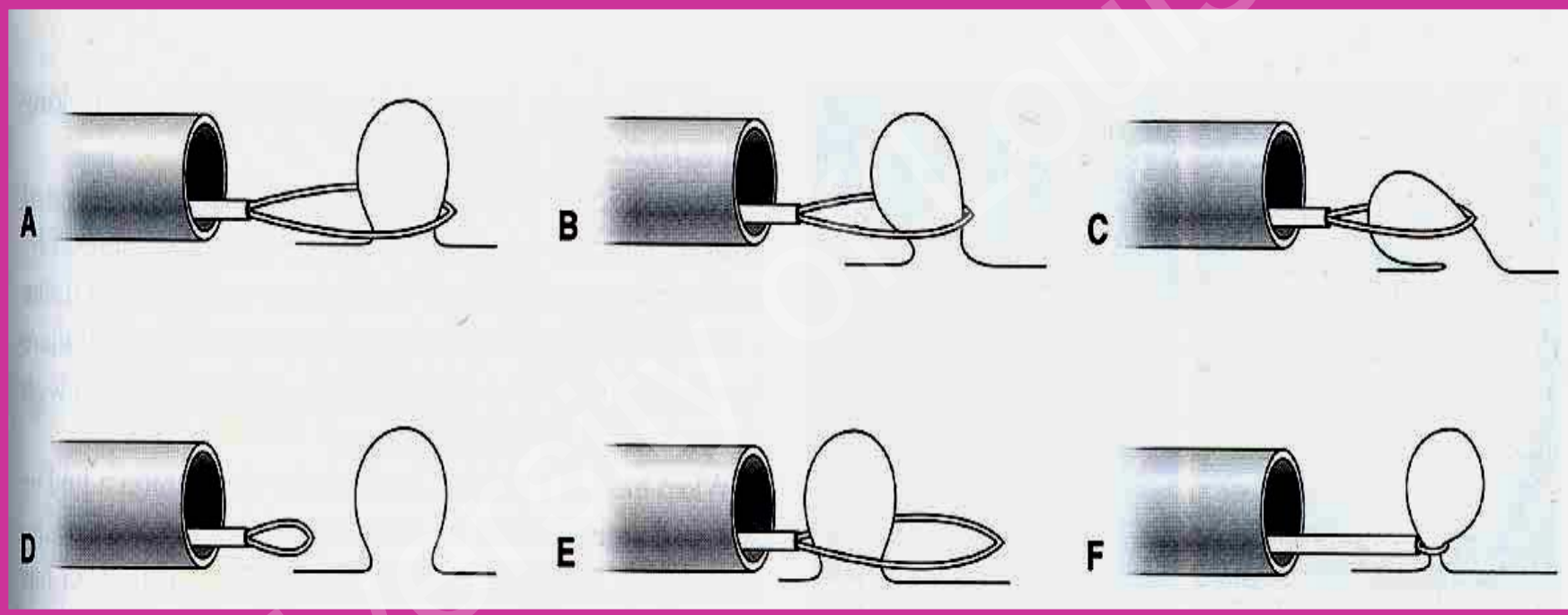


Video 2

Pedunculated Polyp Removal



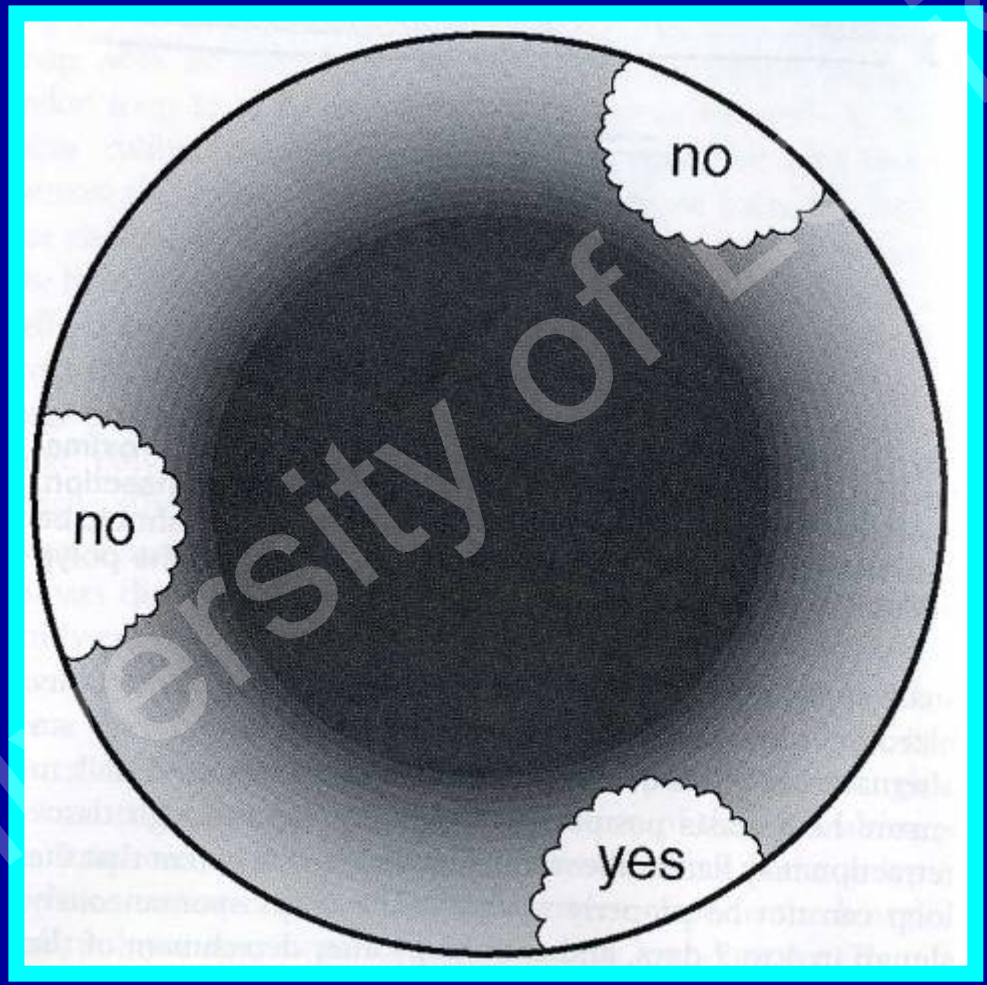
Positioning Snare for Polypectomy



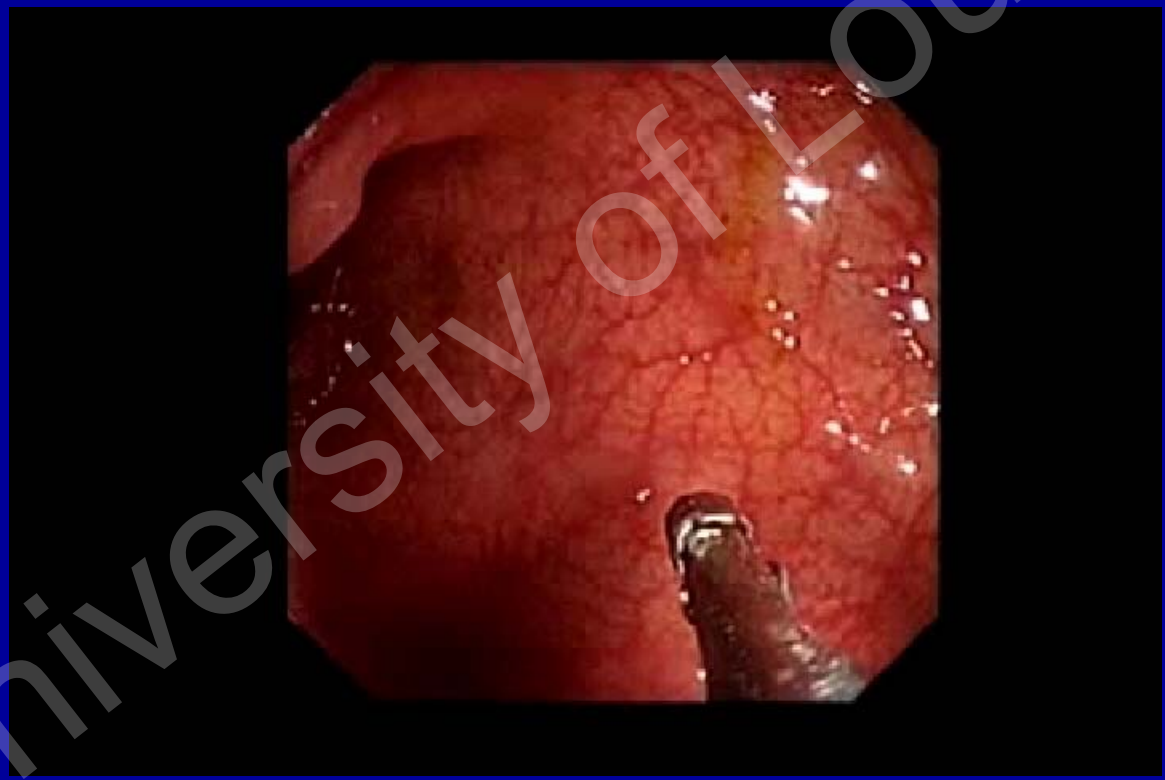
Video 3
Small Pedunculated Polyp Removal

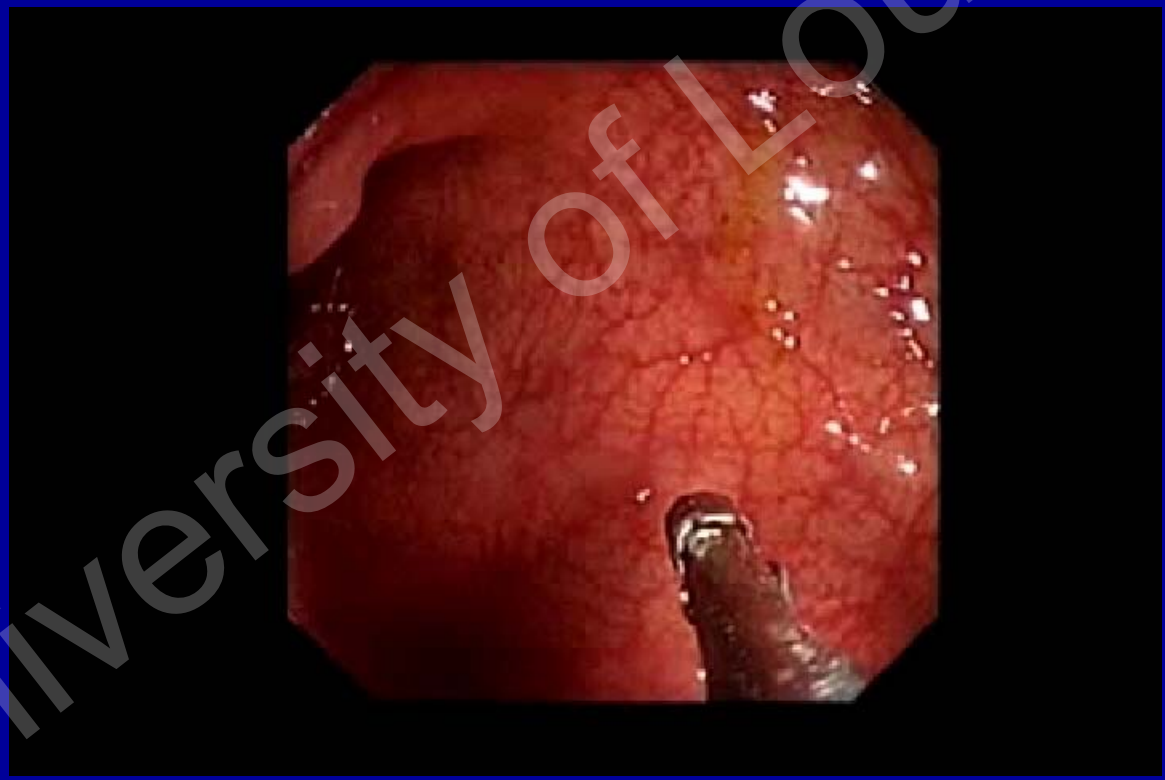
Use of Hot Biopsy Forceps

Torque Scope to Position Lesion

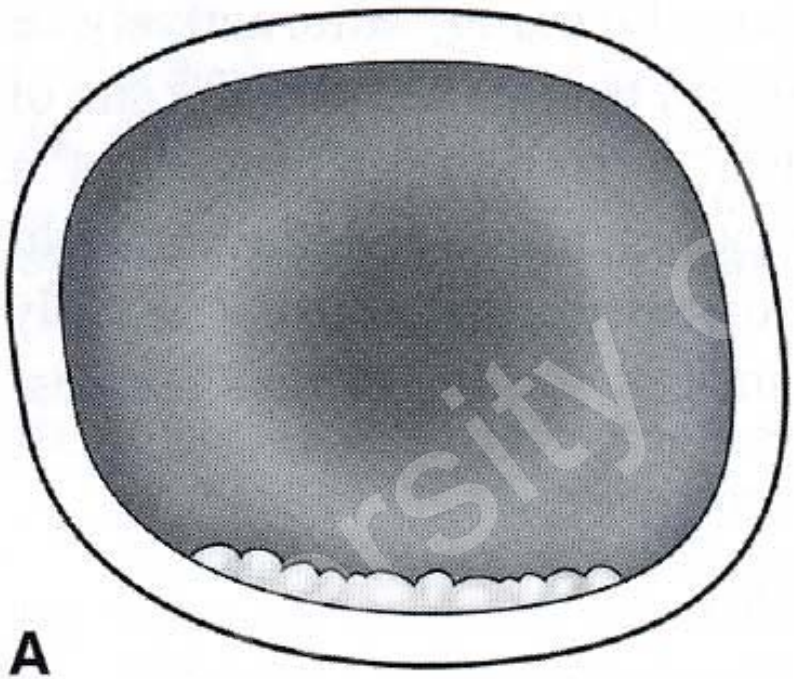


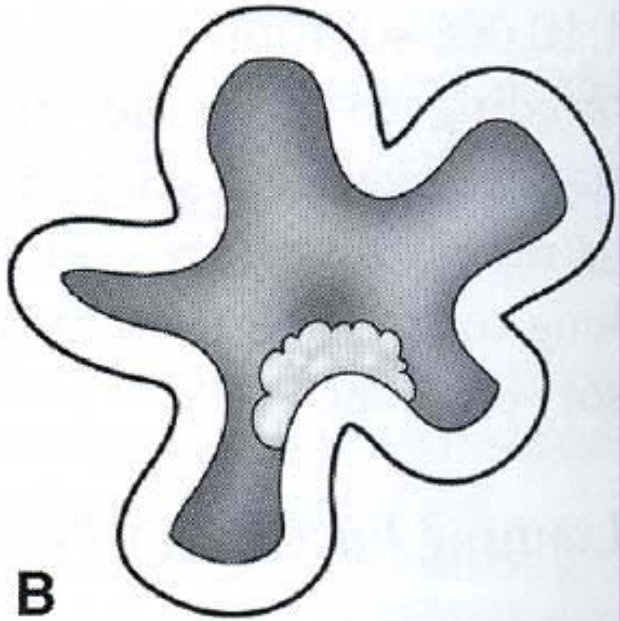
Rotating Scope to 5 O'clock



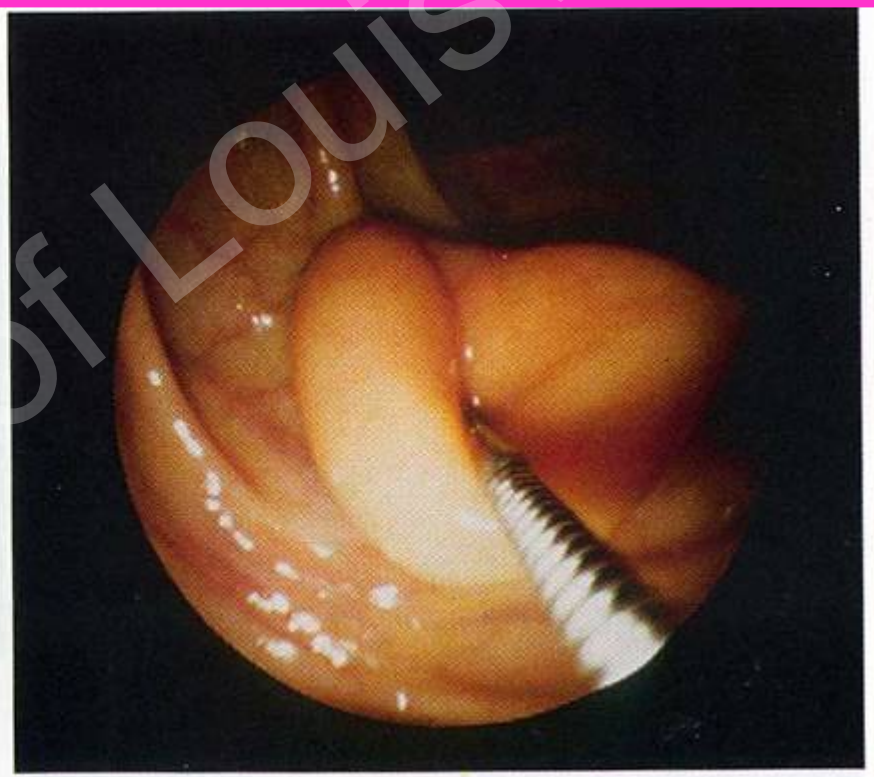


Polypectomy

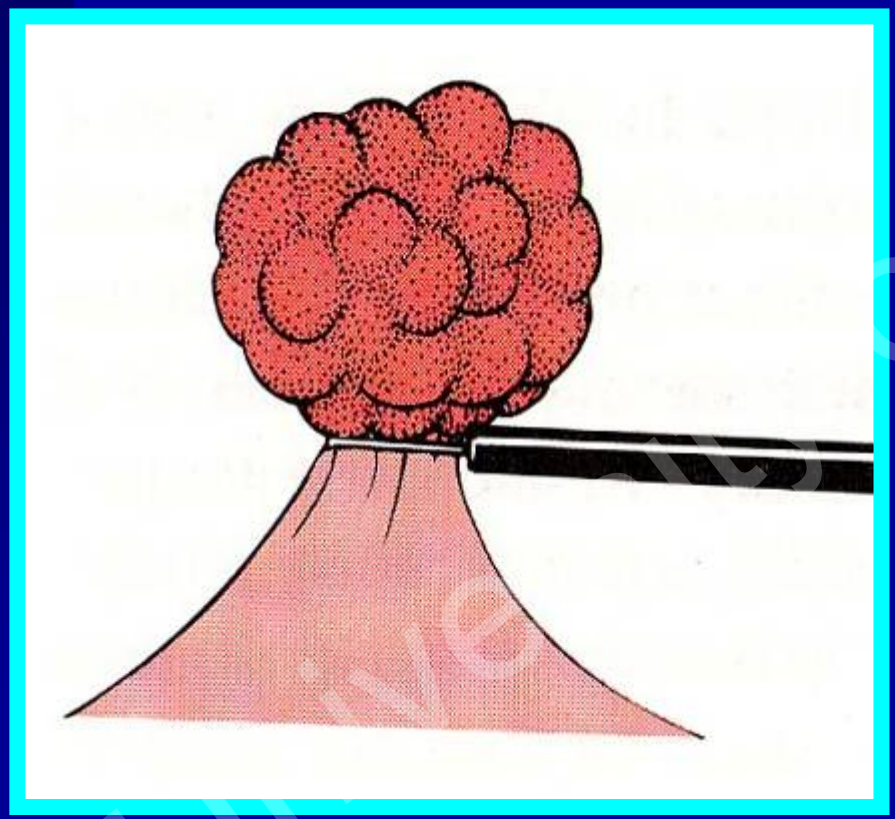


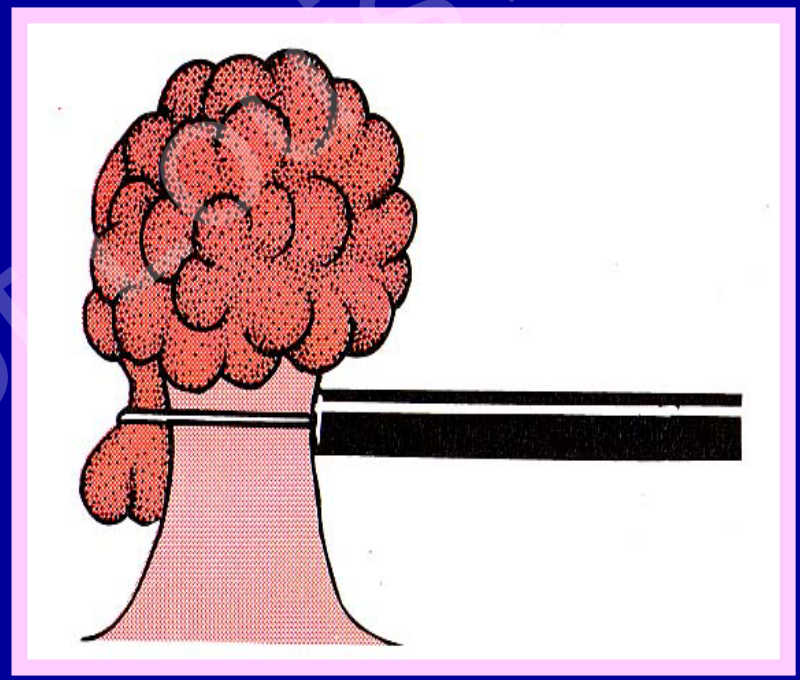


Pillow Sign

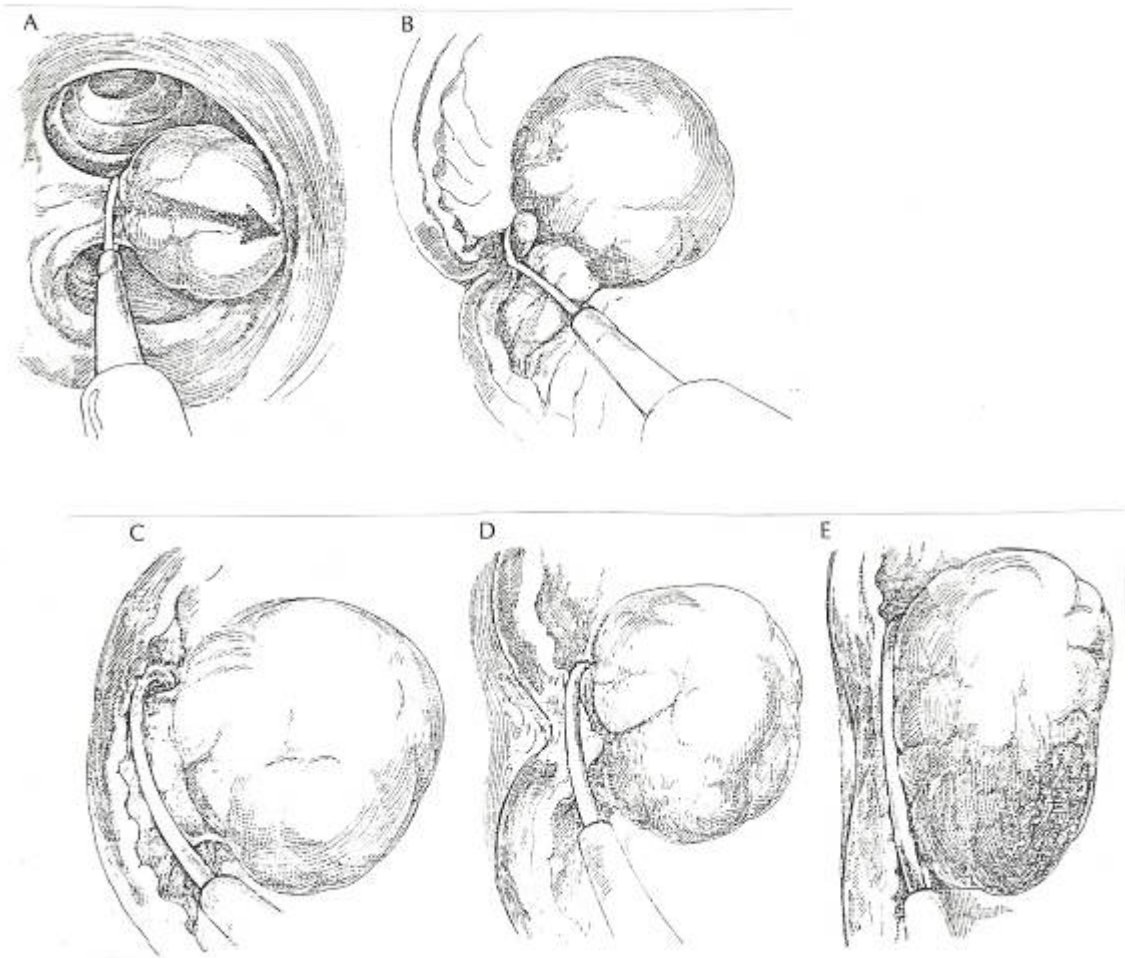


Polypectomy

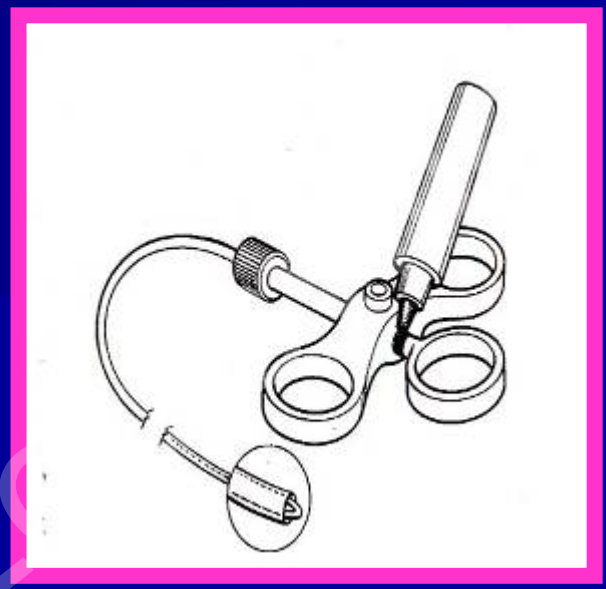


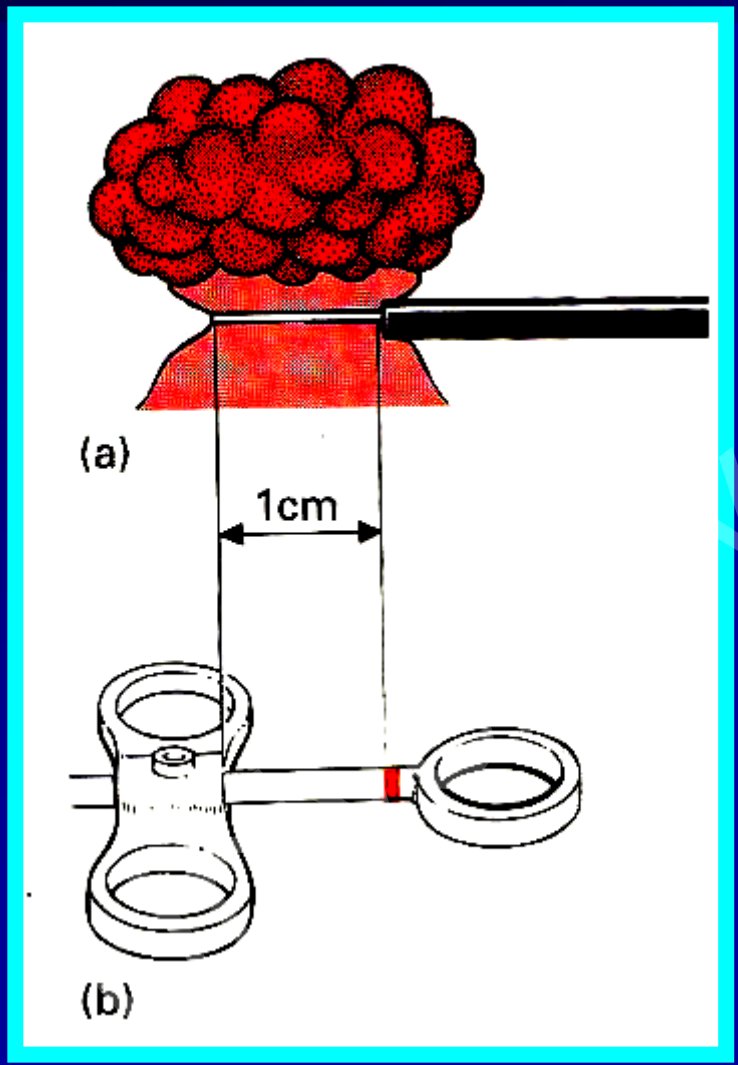


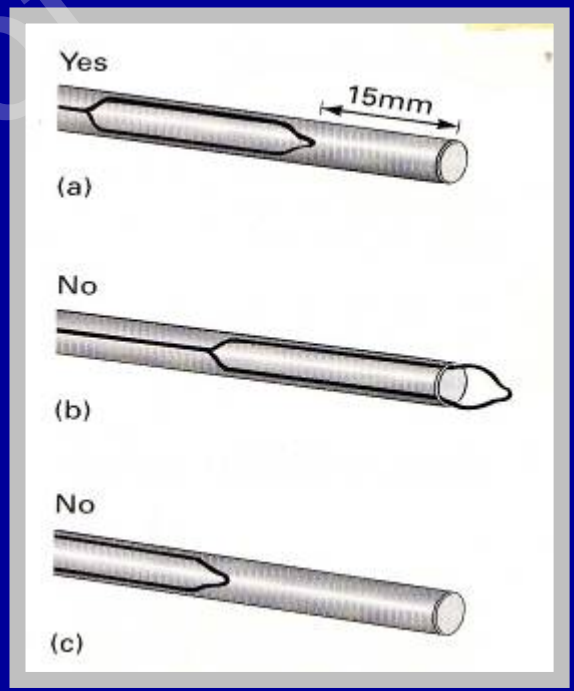
Polypectomy



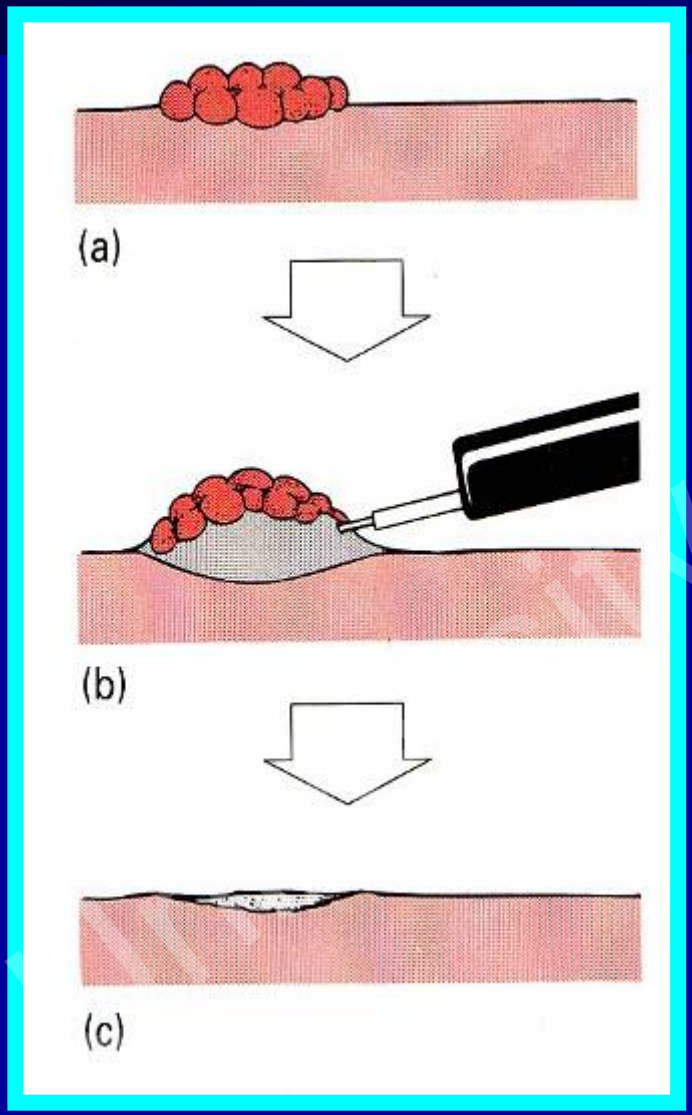
Marking the Polypectomy Snare

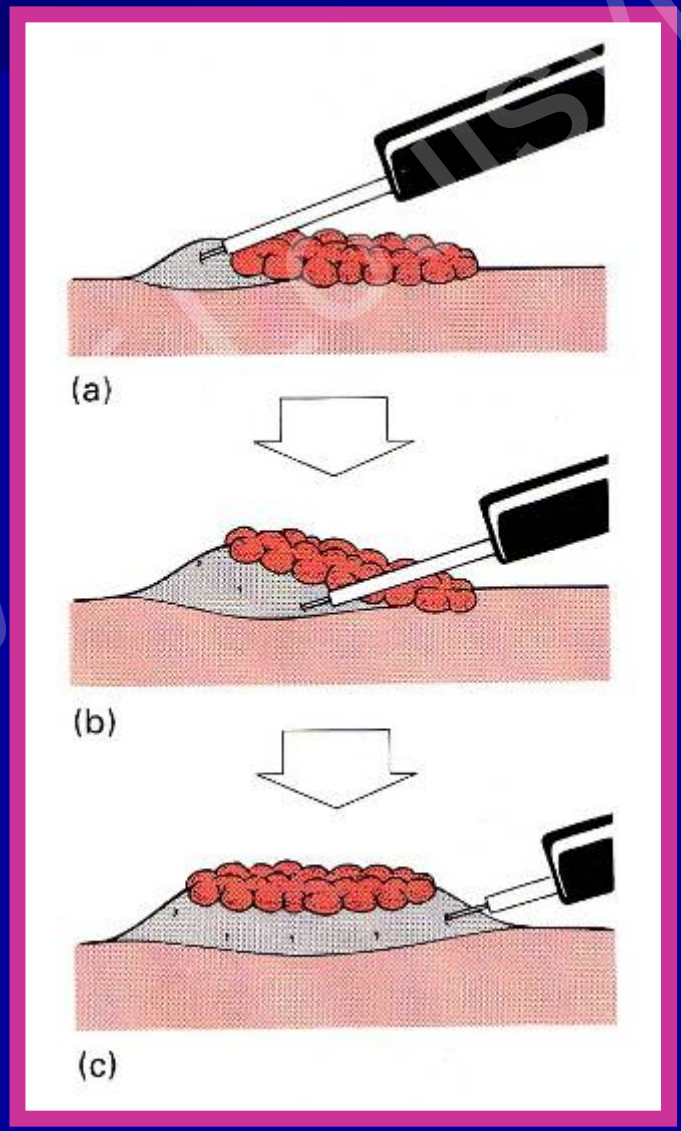




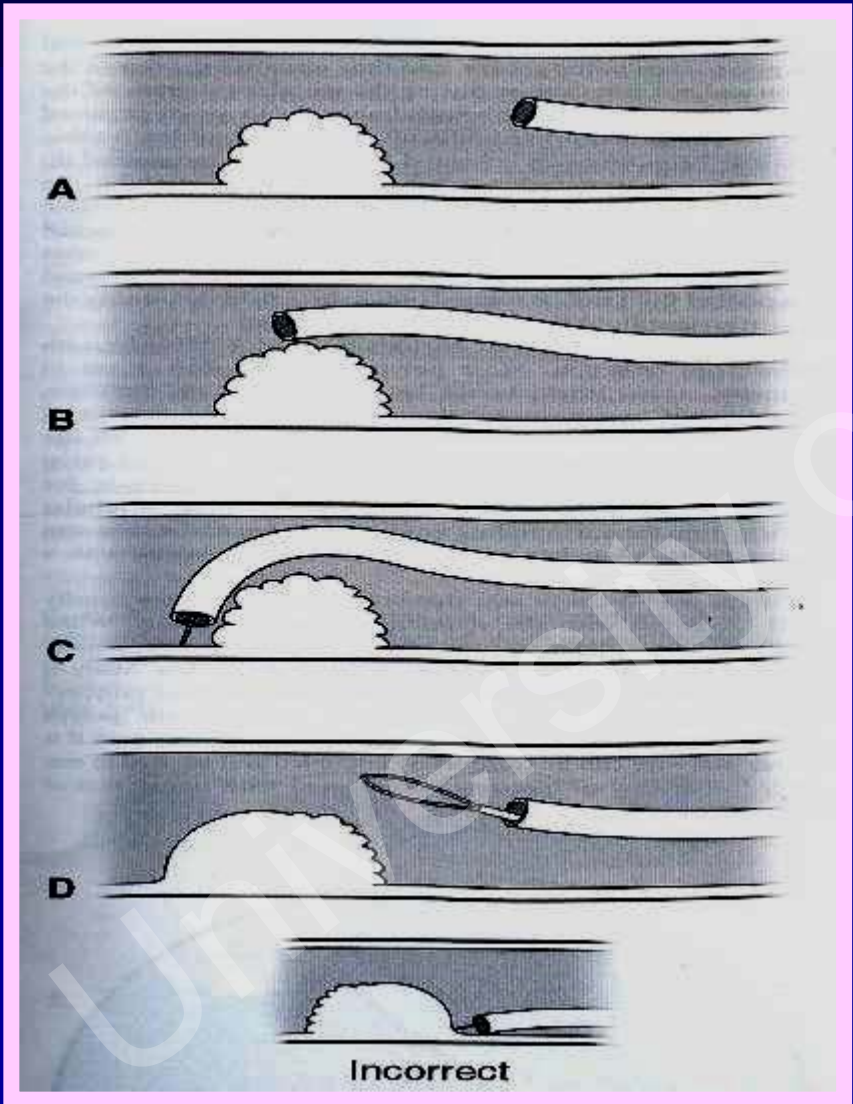


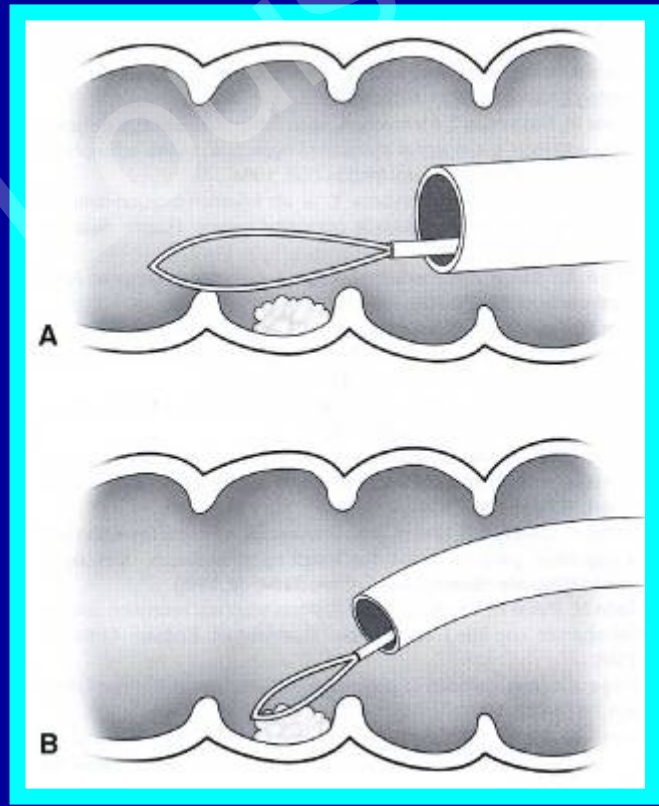
Saline Lift Polypectomy





Tips on Polypectomy

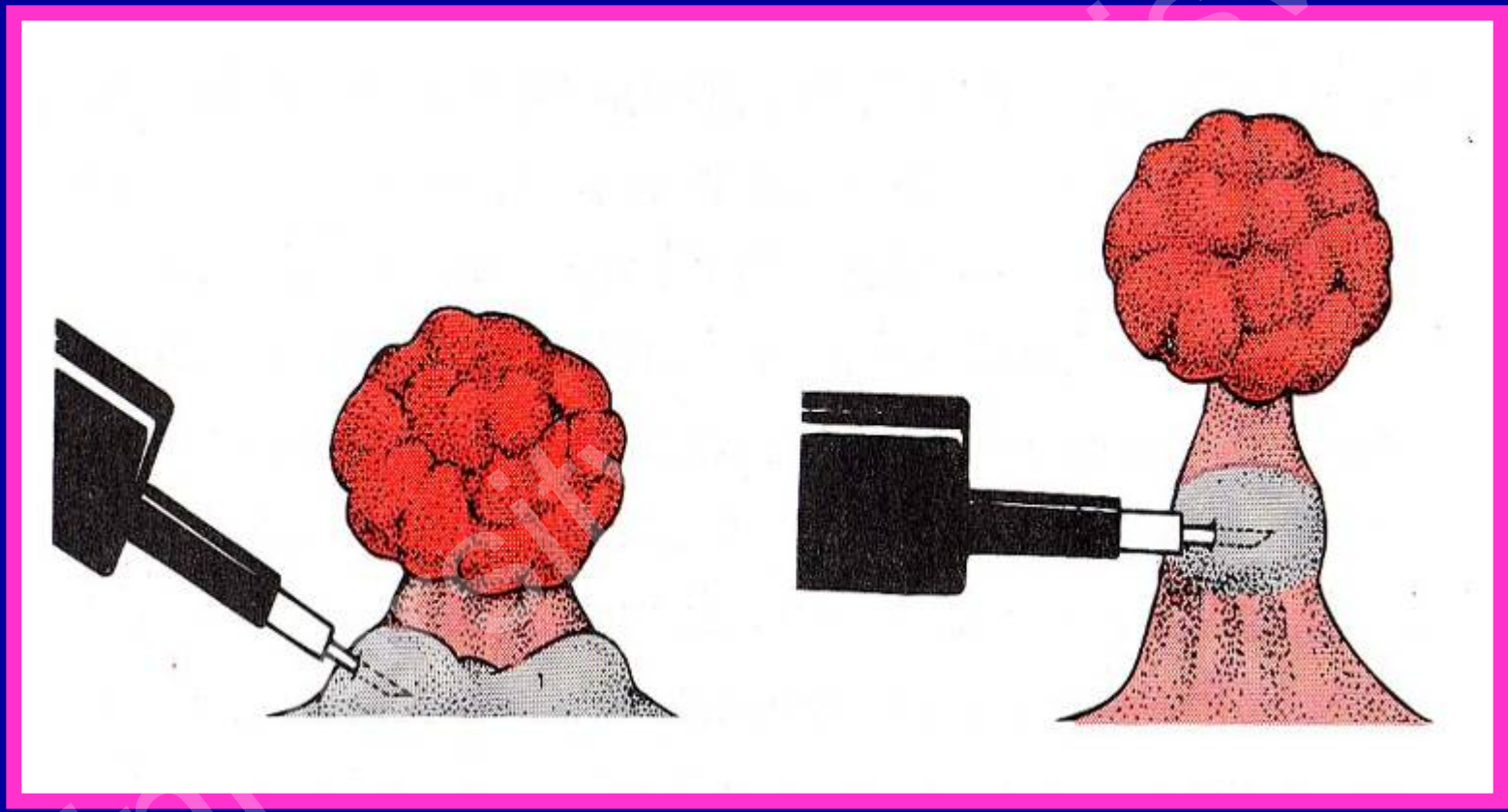




Video 5
Sessile Polyp Saline Lift

Video 7
Methylene Blue Saline Lift

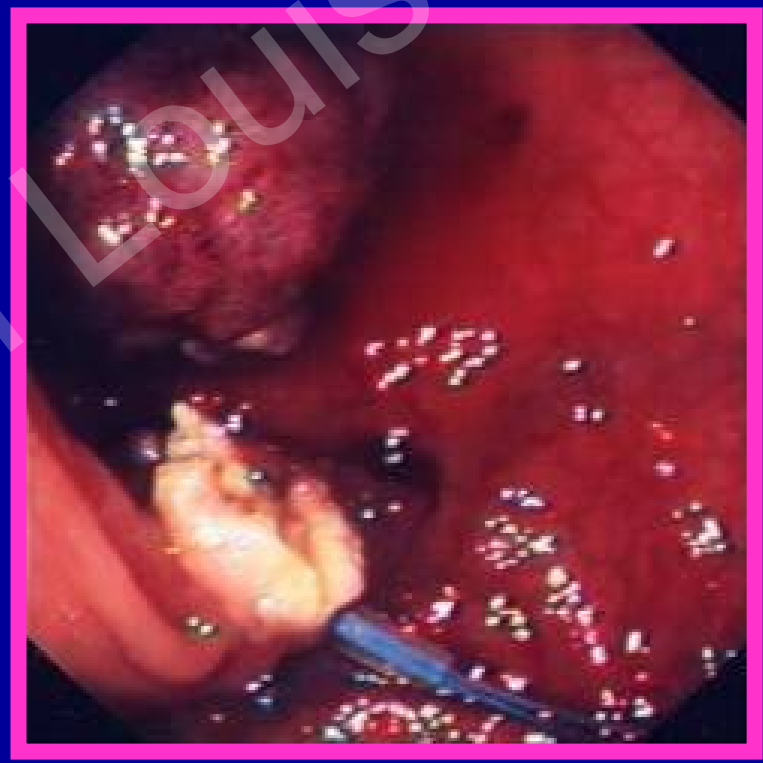
Polypectomy with Large Stalk



Video 4

Large Pedunculated Polyp Removal

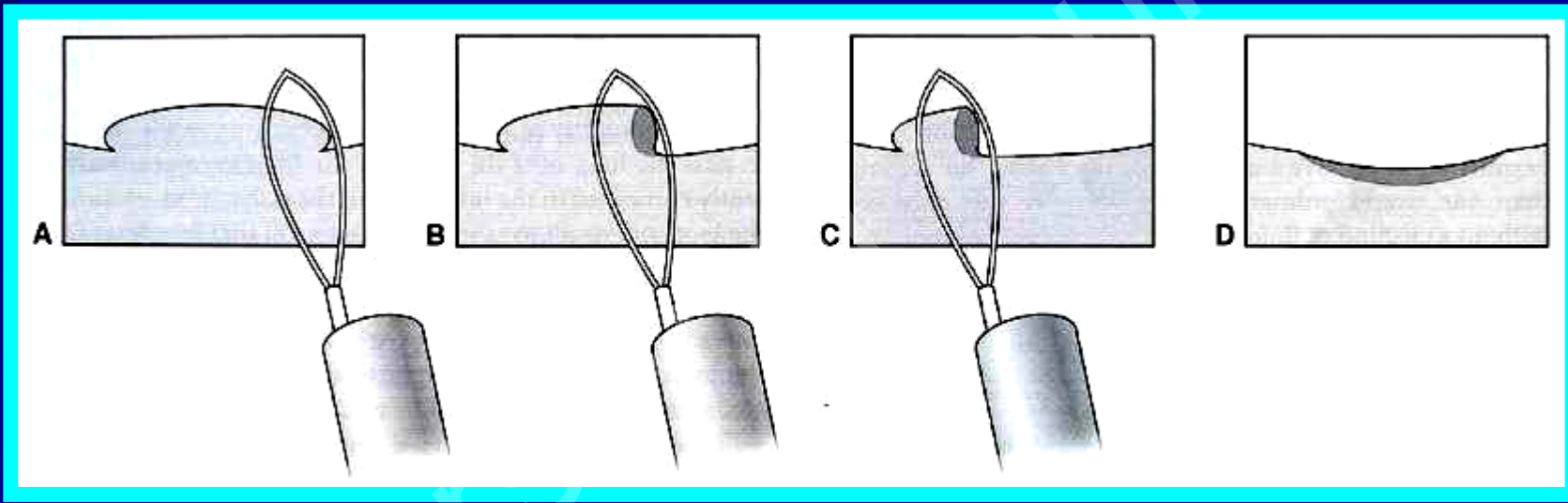
Use of Endoloop for Polypectomy



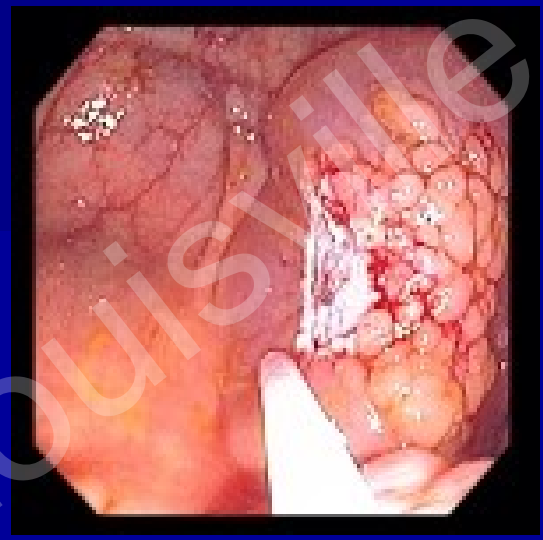
Video 8

Use of Endoloop for Polypectomy

Piecemeal Polypectomy



Piecemeal Polypectomy



Video 6

Saline Lift Piecemeal Resection

The End