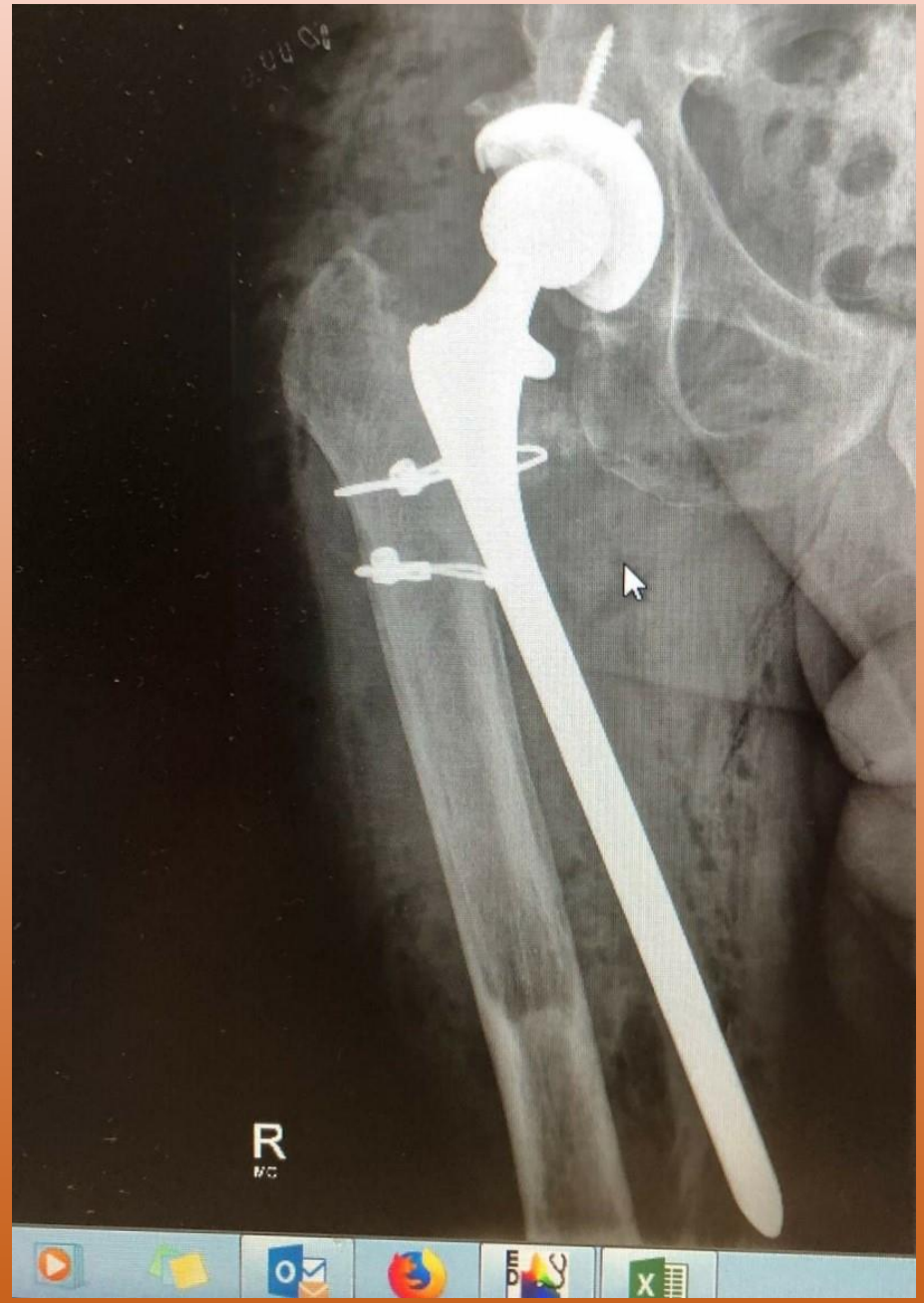
"Yikes! A Perforation at Colonoscopy. What Now?" Endoscopic Methods to Manage a Colonoscopic Perforation

Mike Young



Mike Young

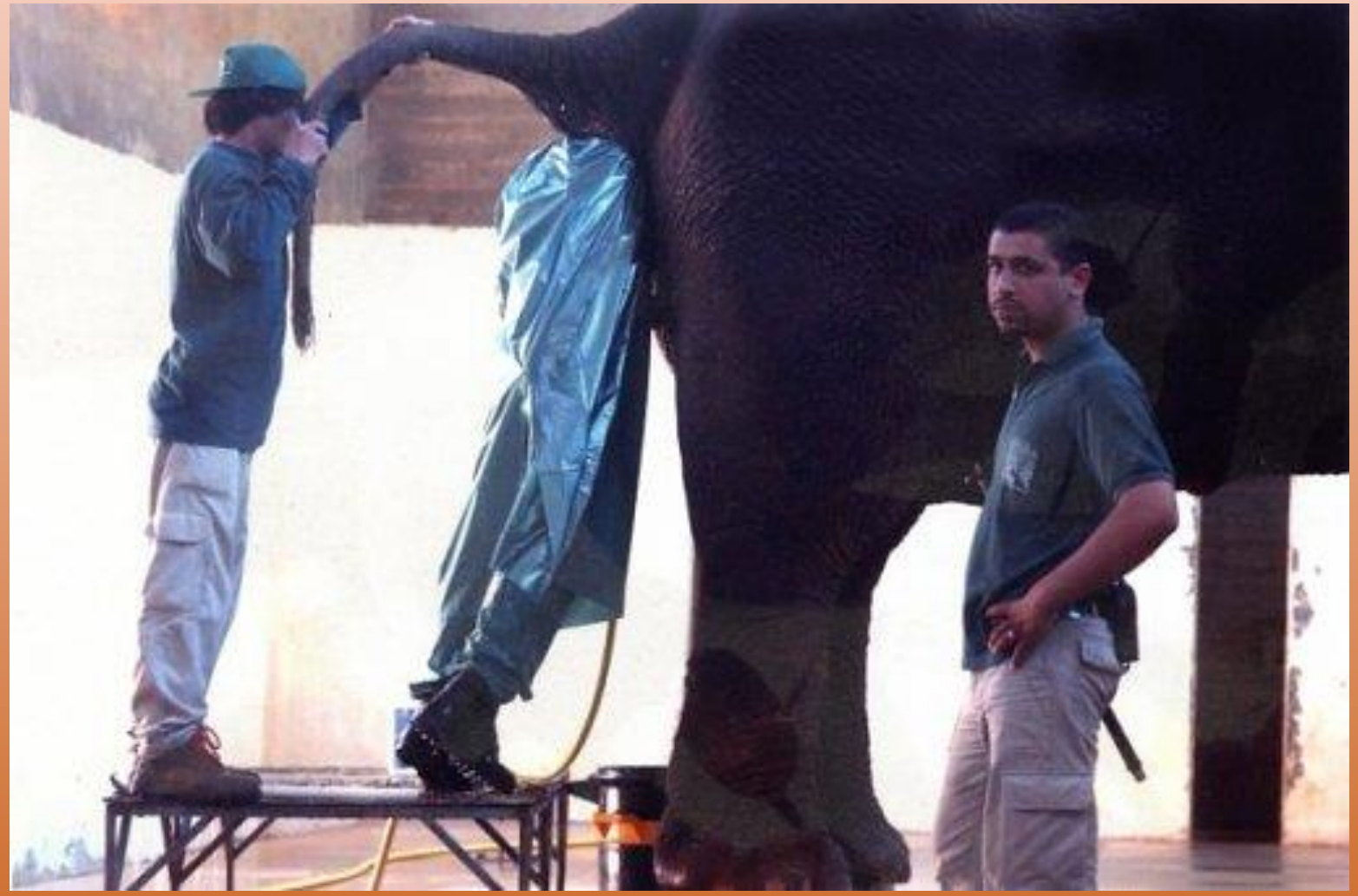
Palmerston North Hospital

NZAGS March 2021

Why I did General Surgery….

NZAGS 2021 ASM Theme:

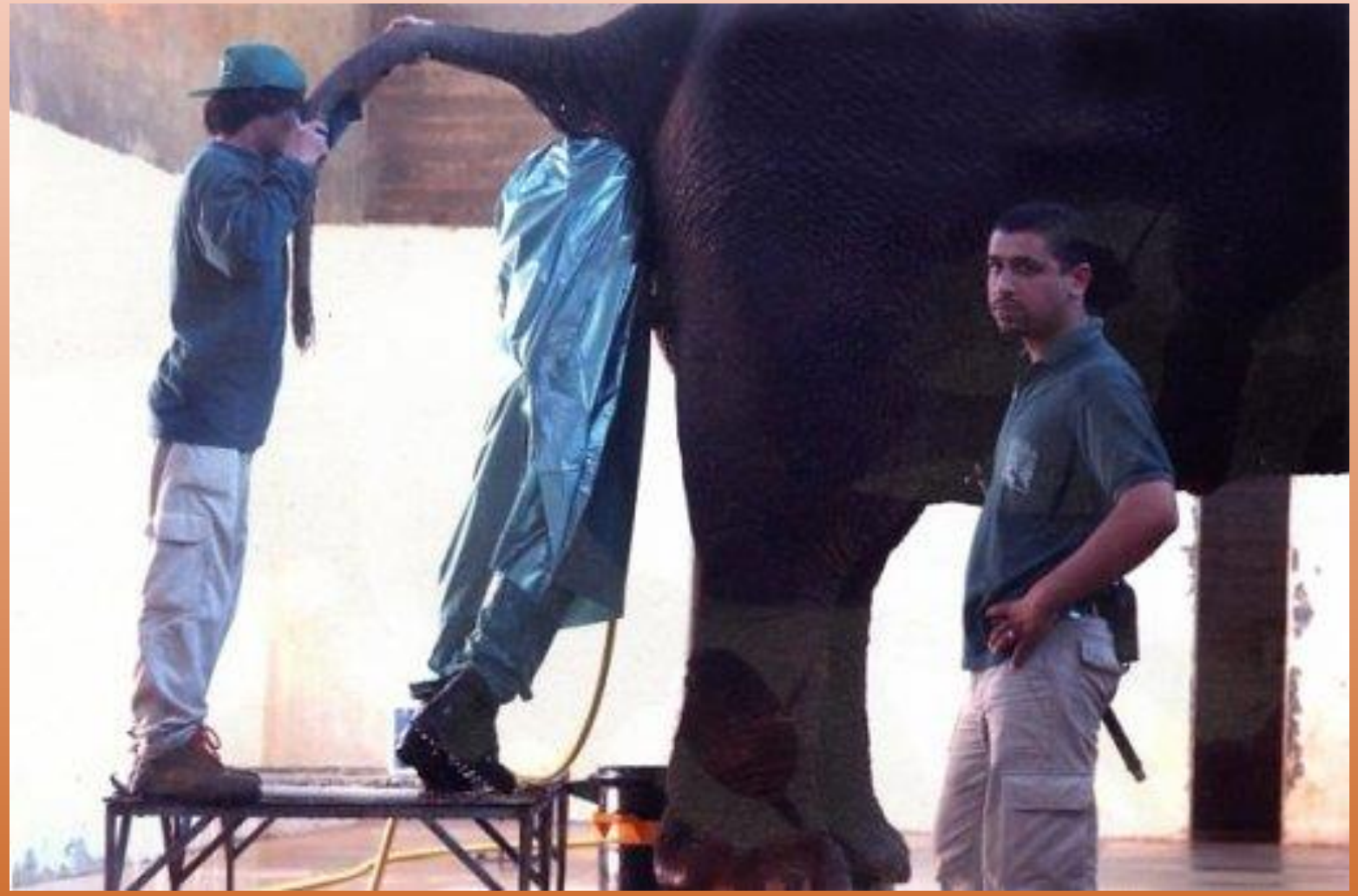
“Yikes…. I’m in the sh*t….”



NZAGS 2021 ASM Theme:

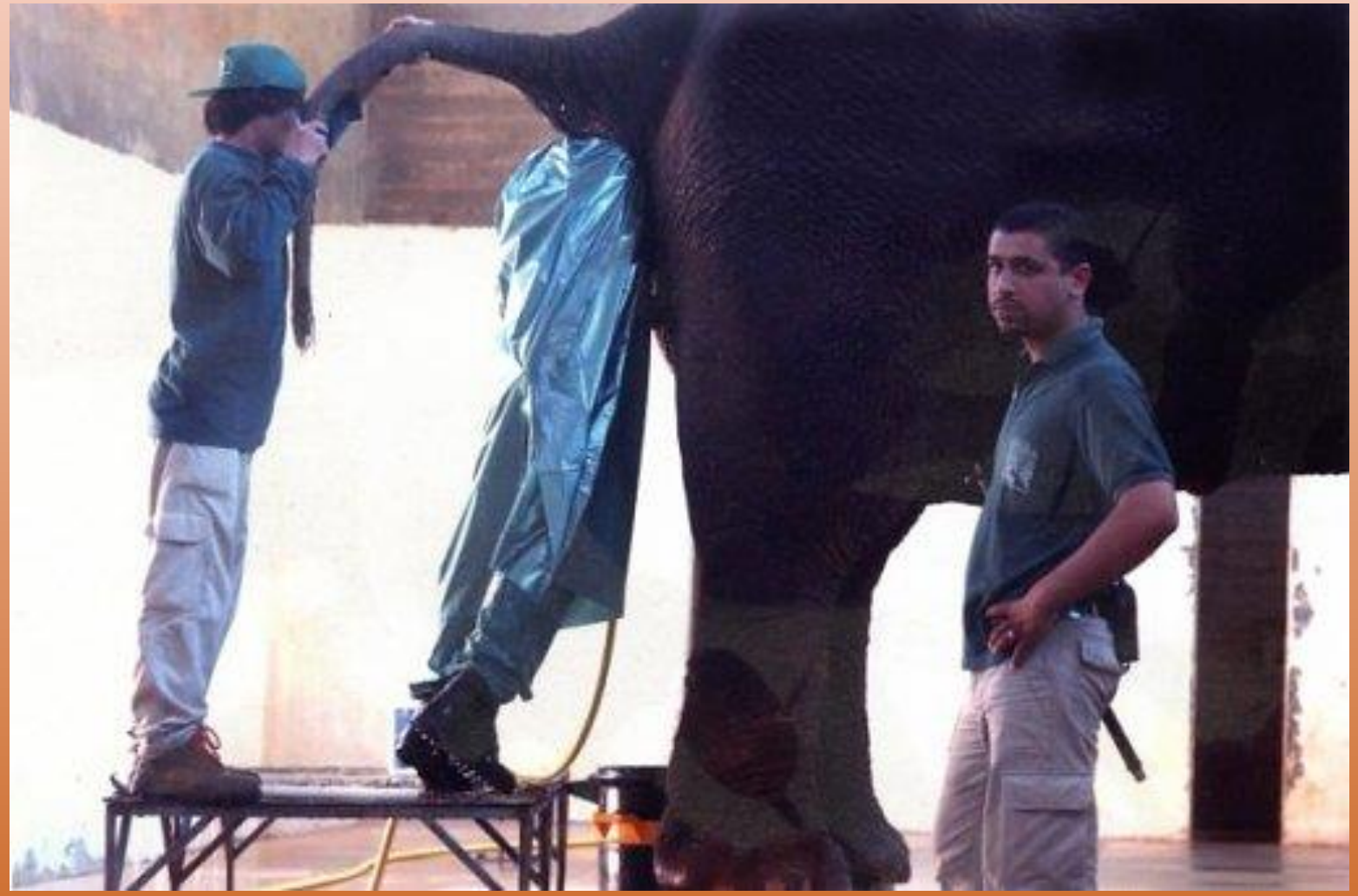
“Yikes…. I’m in the sh*t”

Yikes??? Not in my vocab



Yikes??? Not in my vocab

“F*ck, I’ve made a hole…”

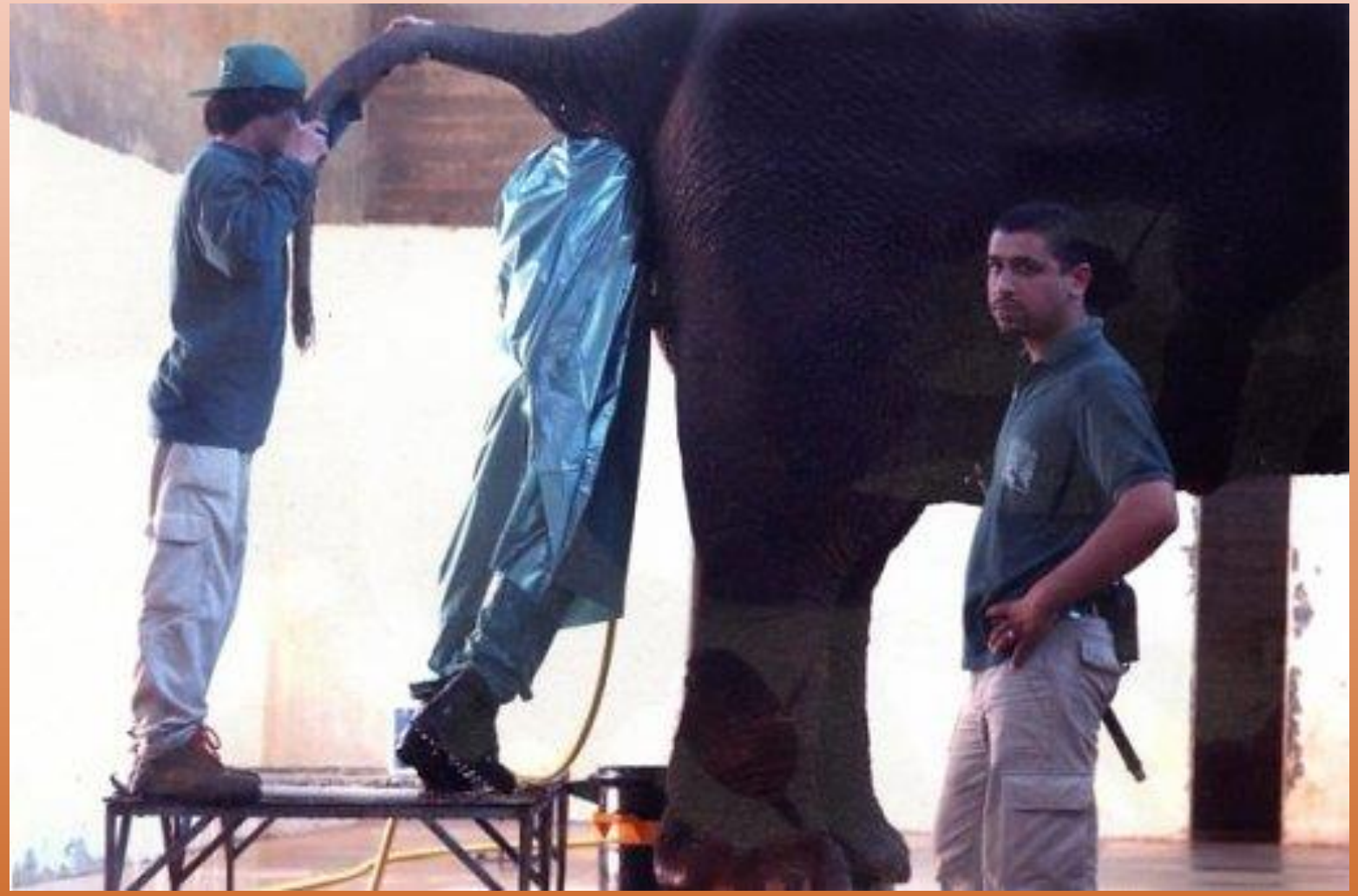



bowel
screening
Time to

“F*ck, I’ve made a hole…”

All evidence on treatment of this topic is anecdotal, small series, retrospective, or based on experimental animal studies.

(Personally involved in c.20 cases over 28 years)



Prevention

Intubation

Intervention

- Lesion removal
- Dilatation

Prevention: Intubation

Gentle technique

Beware:

- Increased patient discomfort
- Difficult ‘stiff’ intubation
- Multiple diverticulae in a short segment

No luminal view- scope tip against bowel wall

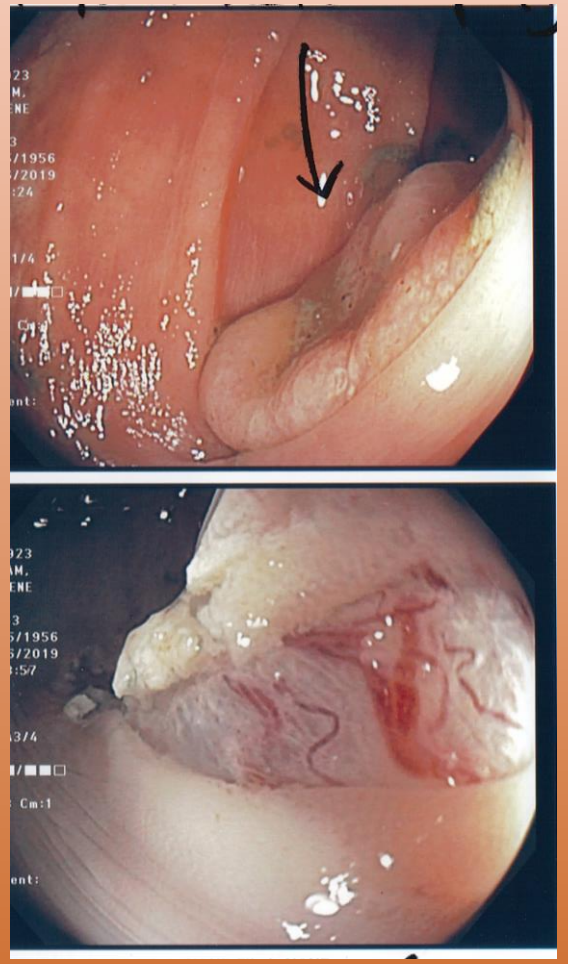
Beware Pink to White

Prevention: Lesion removal

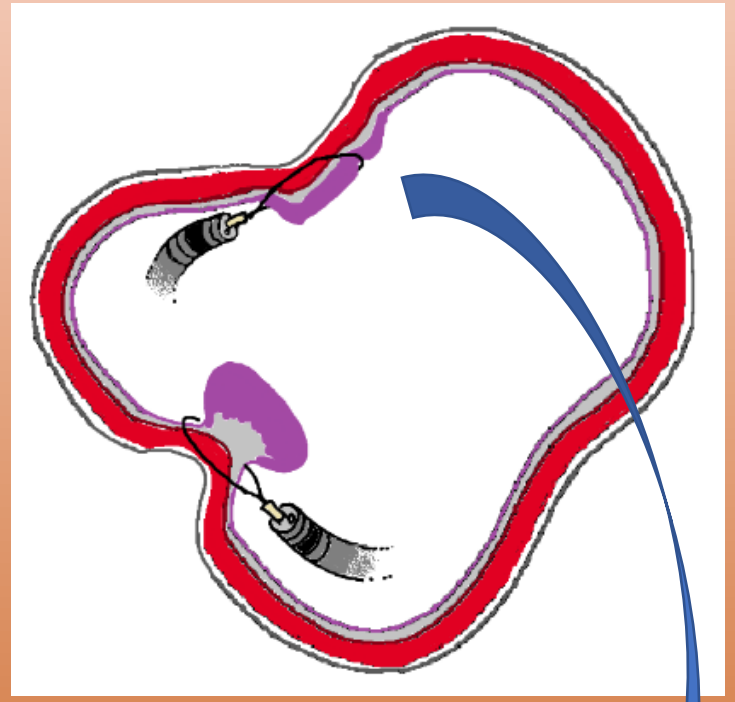
Trial run to ensure scope tip and instrument access to all of the pathology e.g. sessile polyp straddled across a haustral fold

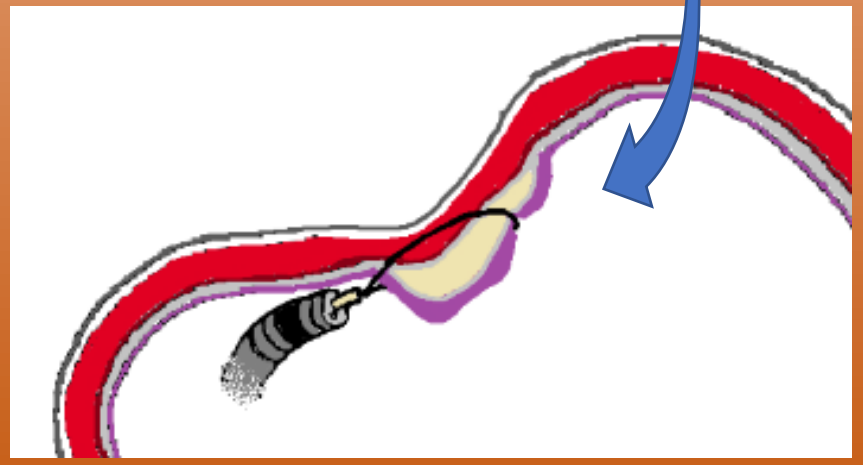
Access and view can change once removal started esp. with submucosal injection

Do not start if you cannot access all of it

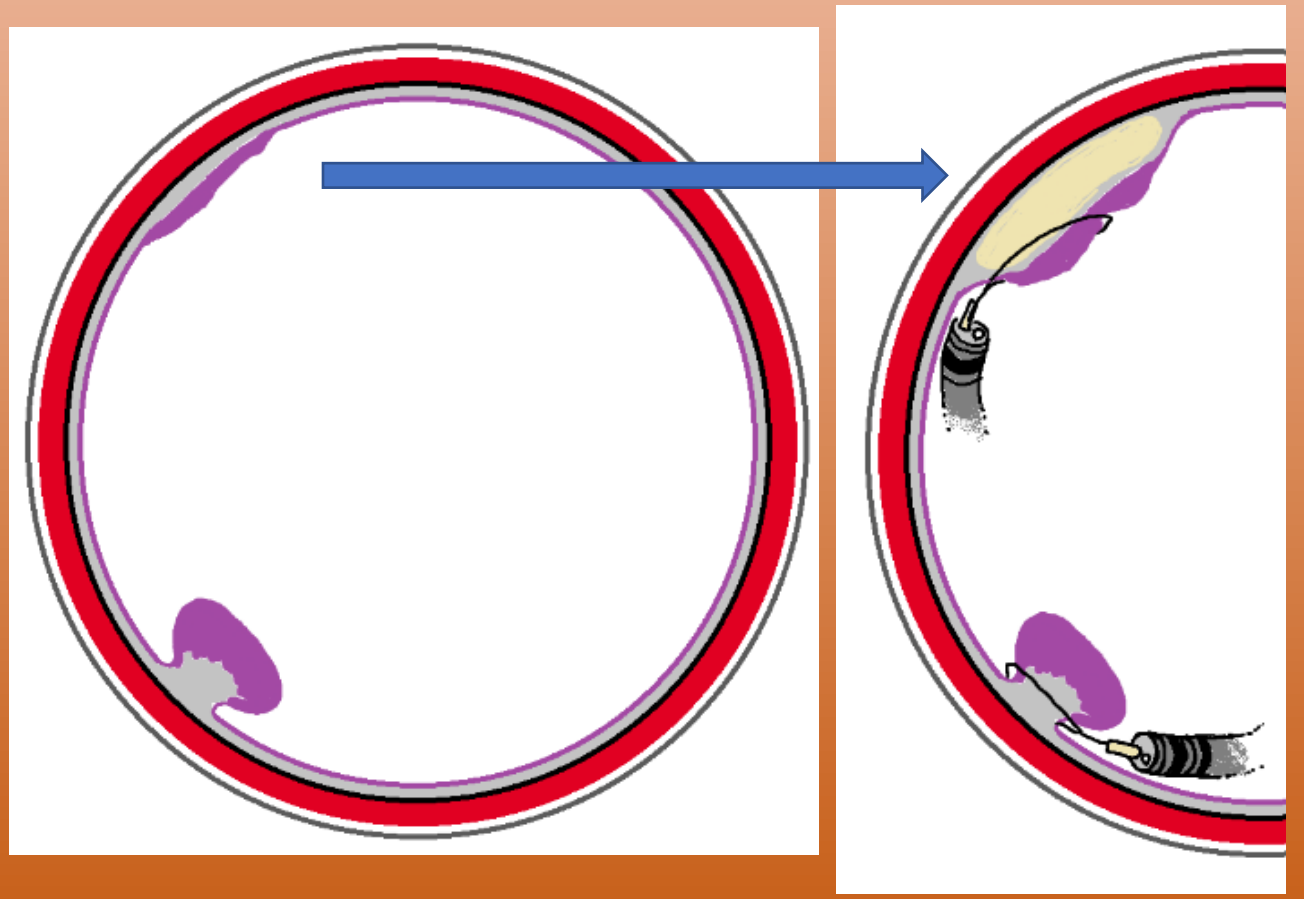


Prevention: Lesion removal





Assess muscularis propria contour with inflated bowel, even after submucosal fluid injection



Prevention: Lesion removal

Excise in the SUBMUCOSAL Layer

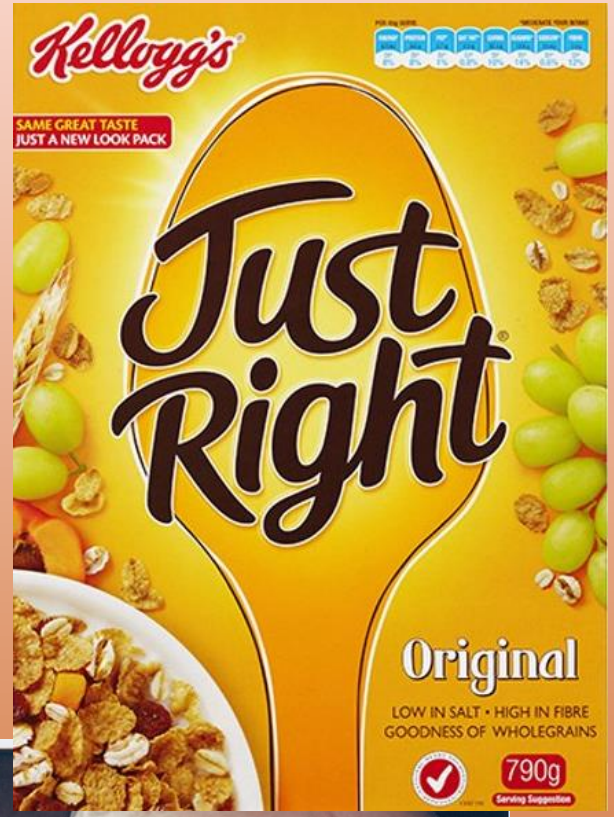
Too shallow:

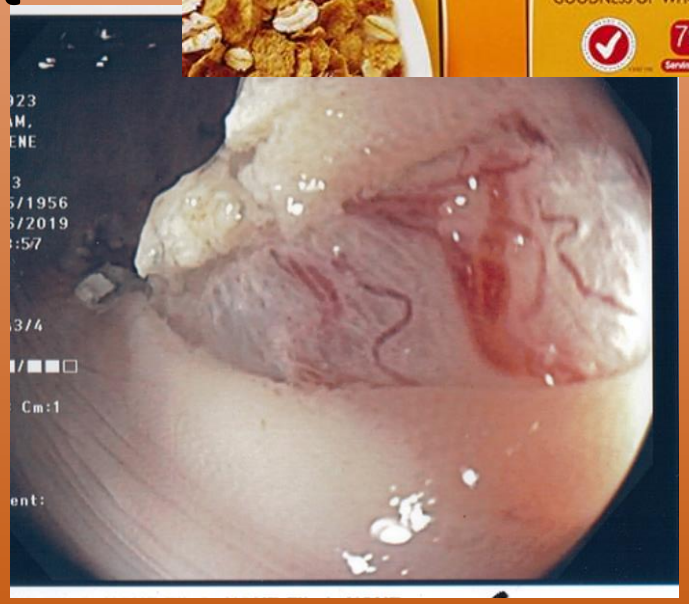
Bleeding

V high recurrence which is v hard to resect endoscopically next time

Too deep:

You dumb-arse



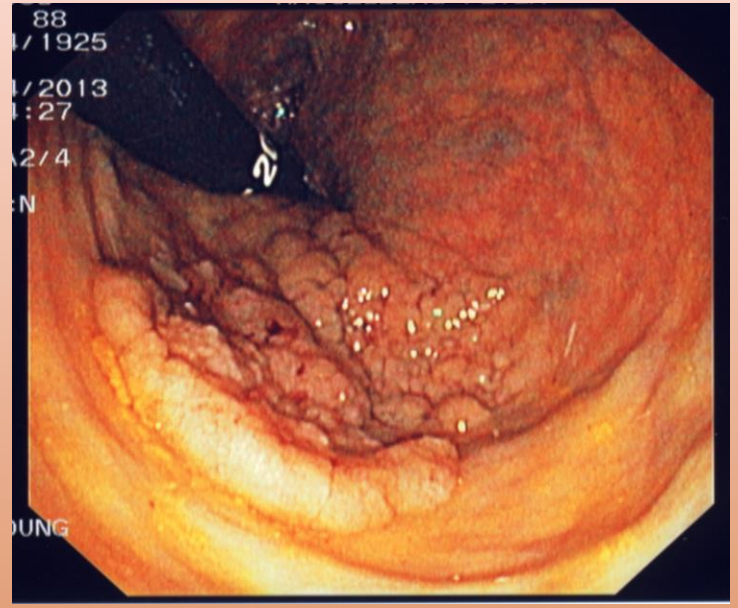


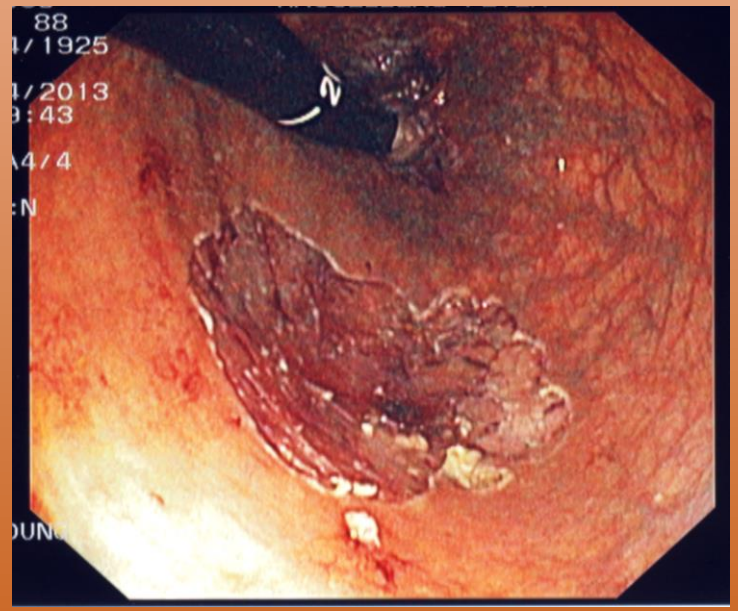
Prevention: Lesion removal

Cold snare vs hot device - cold has overall better safety profile

Can use multiple passes of cold snare for larger sessile polyps, even after submucosal fluid injection

Cold snare- Incomplete transection (NO SNIP SOUND) -wait 10 sec before pulling, or open snare afterwards to see and re-position snare. Penis Sign





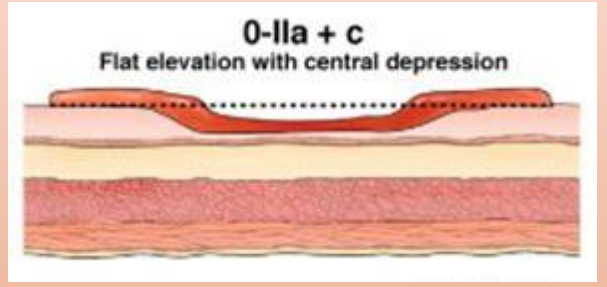
Prevention: Lesion removal

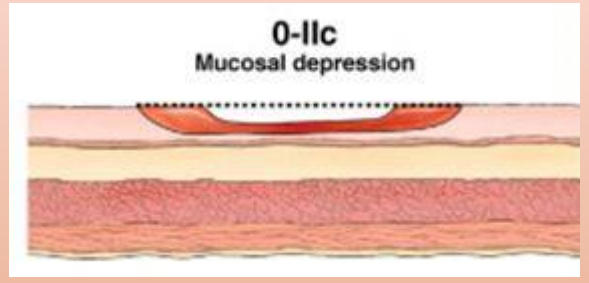
Hot snare/ diathermy/ biopsy forcep- LIFT BEFORE BURN, (same concept as per conventional surgery), submucosal fluid injection +/- smaller bites if in doubt

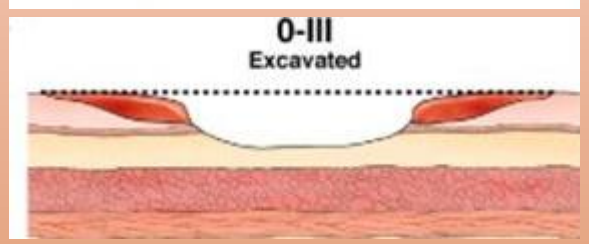
Adrenalin and Hydrostarch submucosal injection (1ml of 1: 10,000 A + 9ml H)

APC- keep tip off mucosa during activation

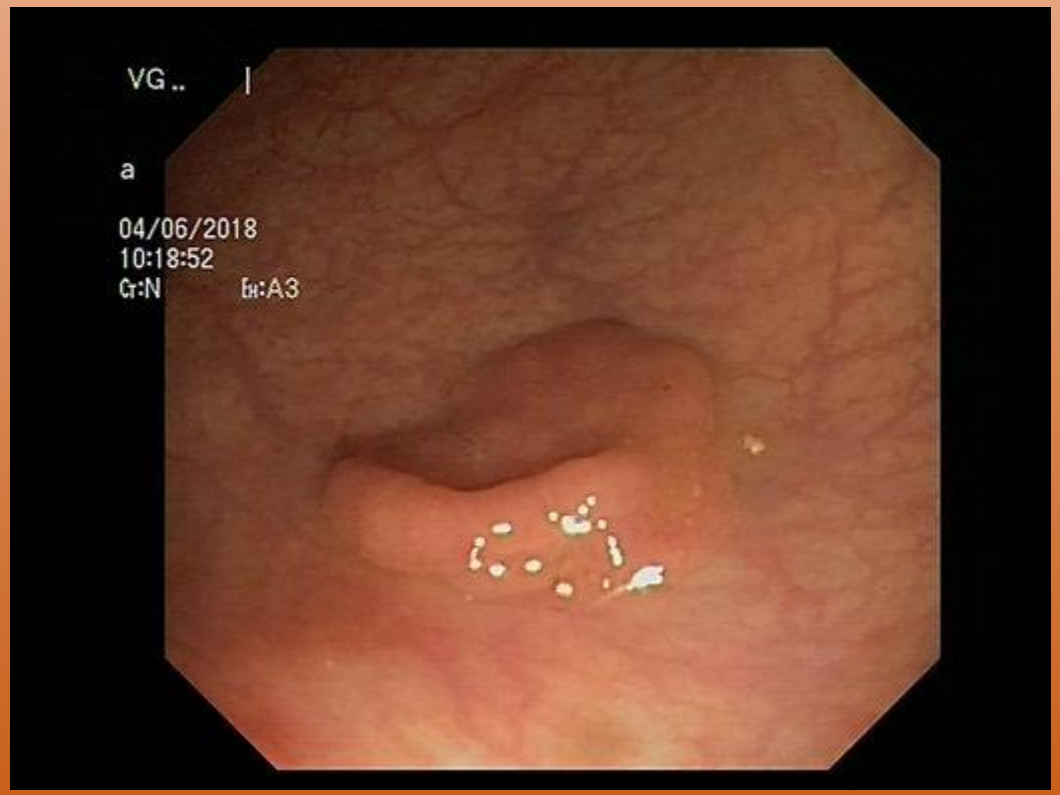
Prevention



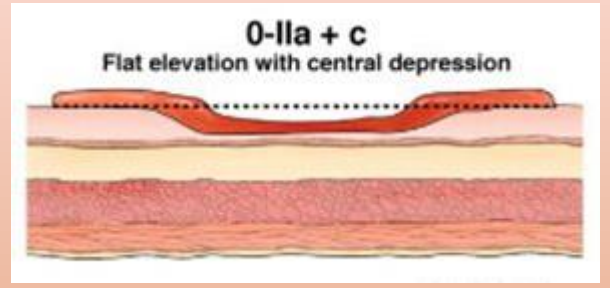


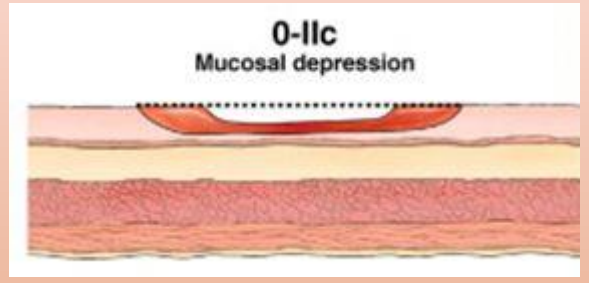


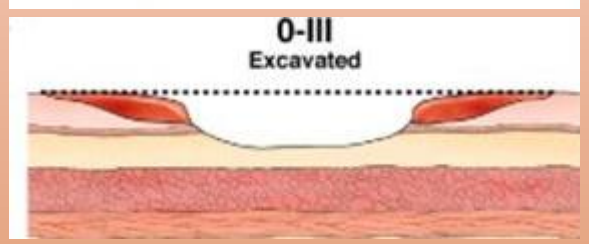
BEWARE Sessile polyp with depressed centre



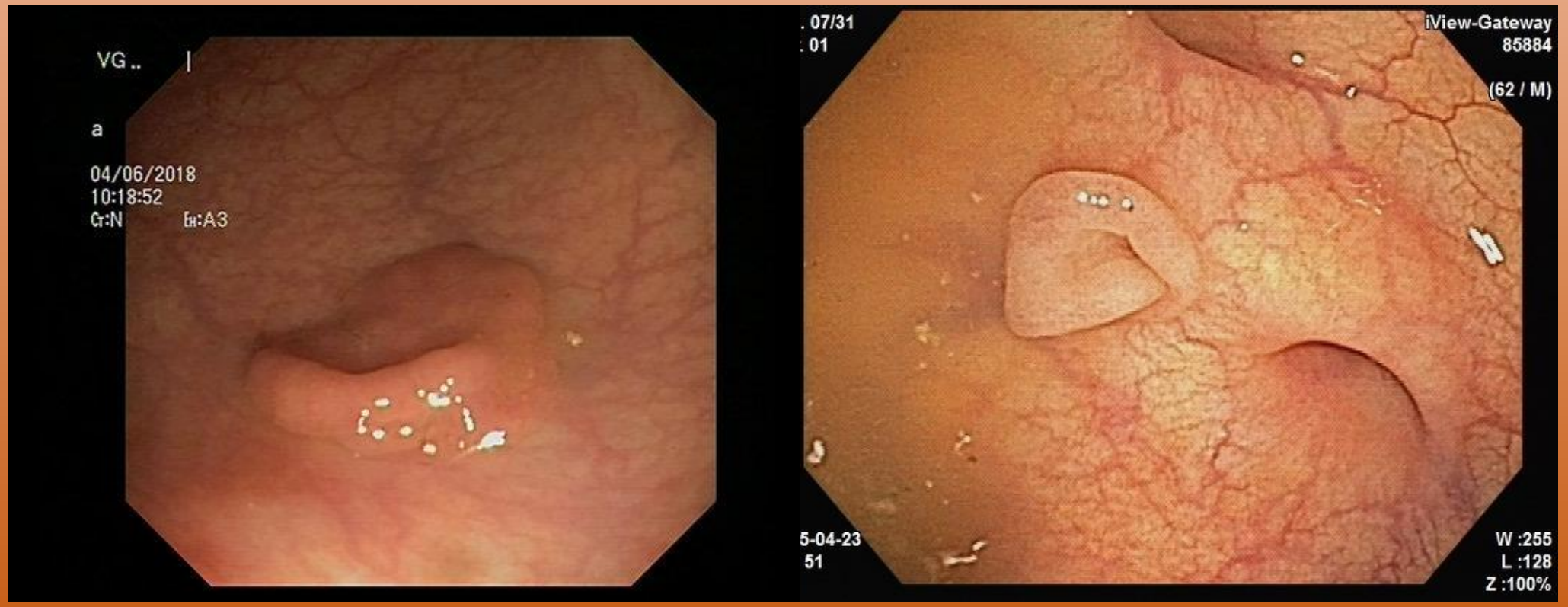
Prevention







BEWARE Sessile polyp with depressed centre vs **inverted diverticulum**



Prevention: Dilatation

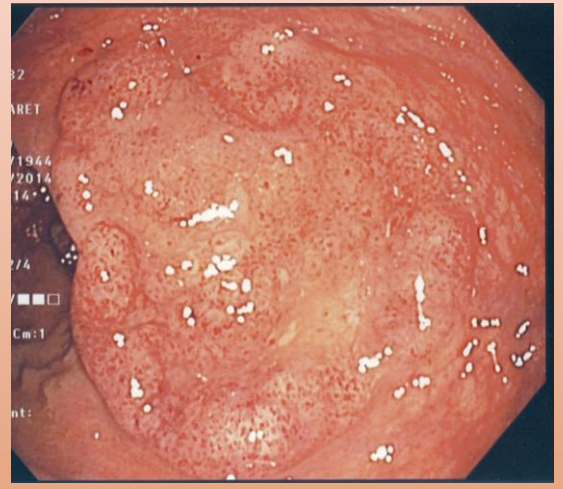
Do it **GRADUALLY** to avoid sudden dilator slippage or tissue tearing

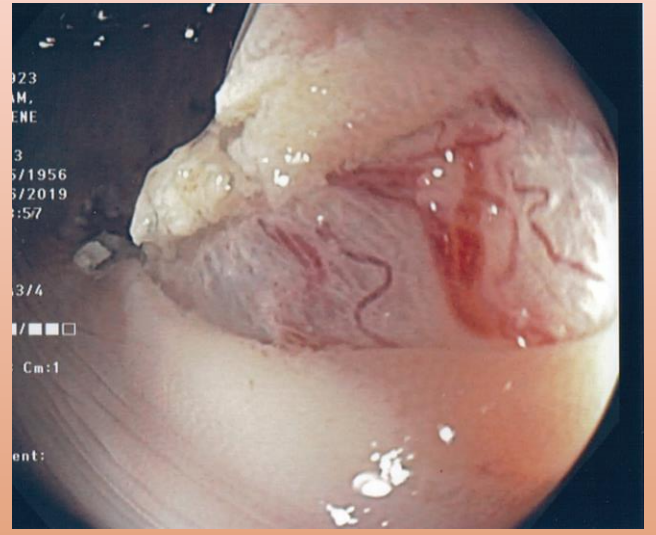
1. Half atm. first
2. Wait 10 sec for balloon to unravel and partially inflate
3. Check position
4. Then increase by half atm. every 30 sec until at desired pressure/diameter
5. Check result after device removal

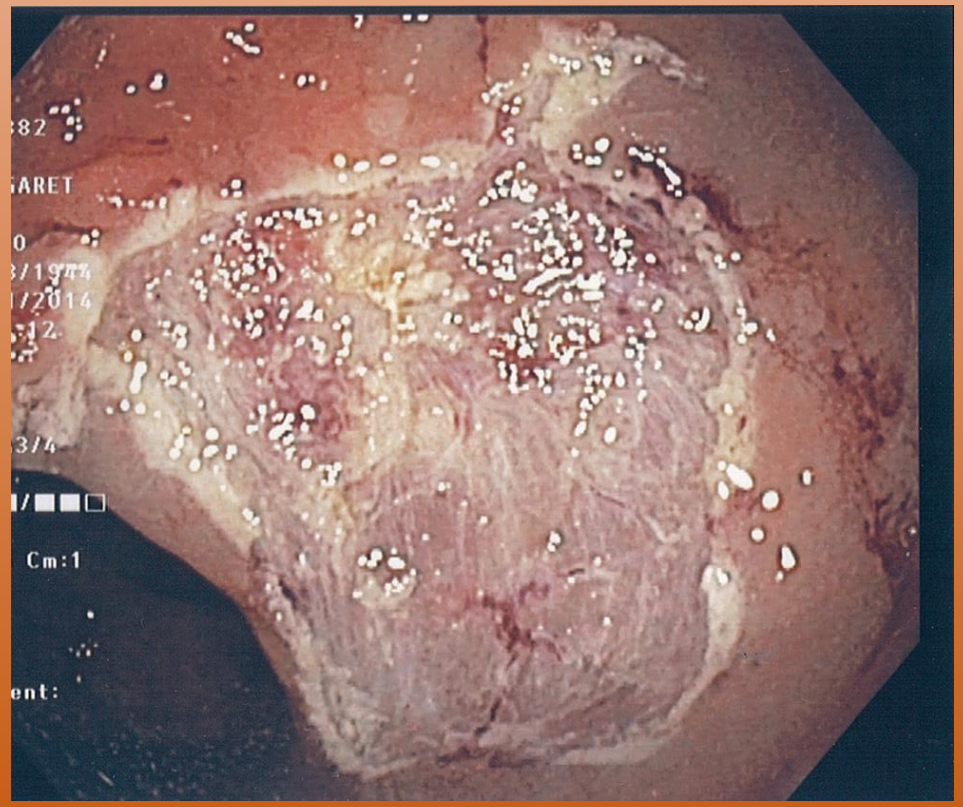
Do not be overly aggressive in one session.

Recognition

Good:







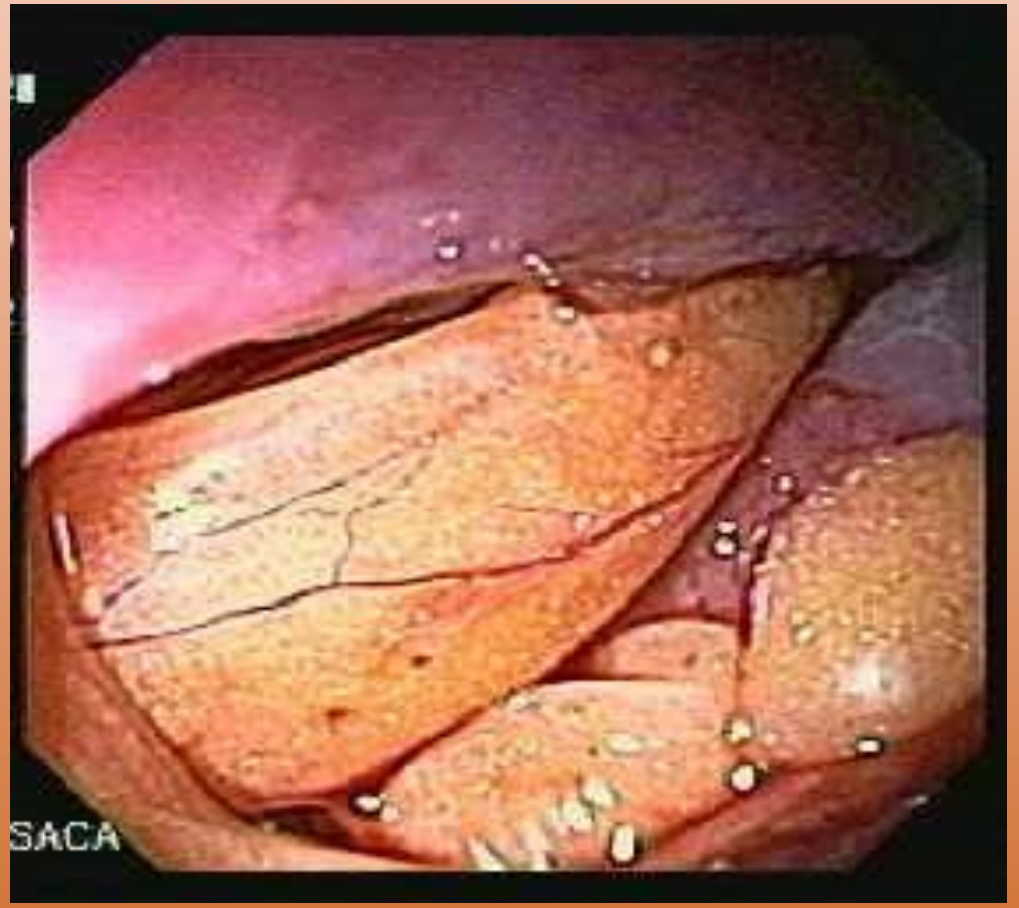
Normal submucosal layer view during large sessile polyp resection

Recognition

During colonoscopy:

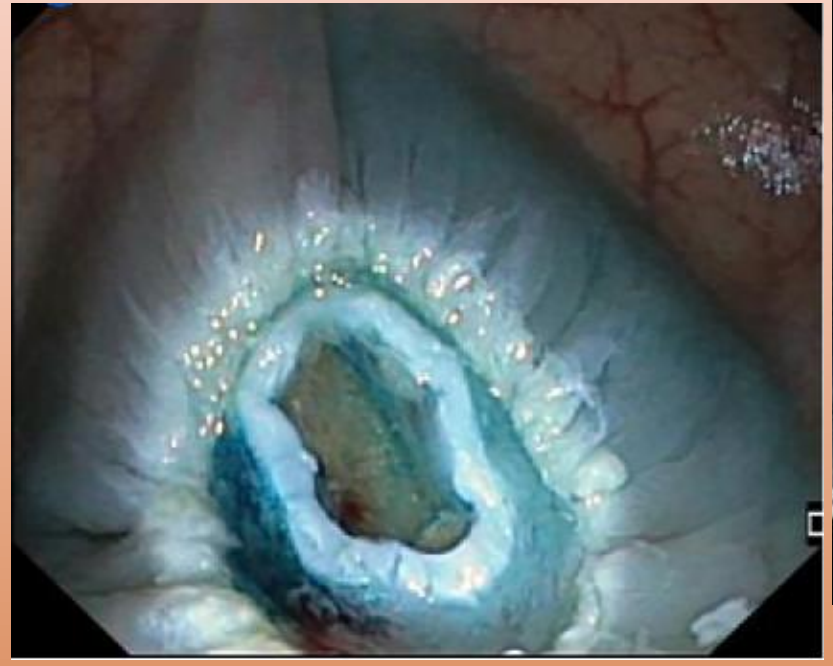
Weird laparoscopic view with minimal pneumoperitoneum!

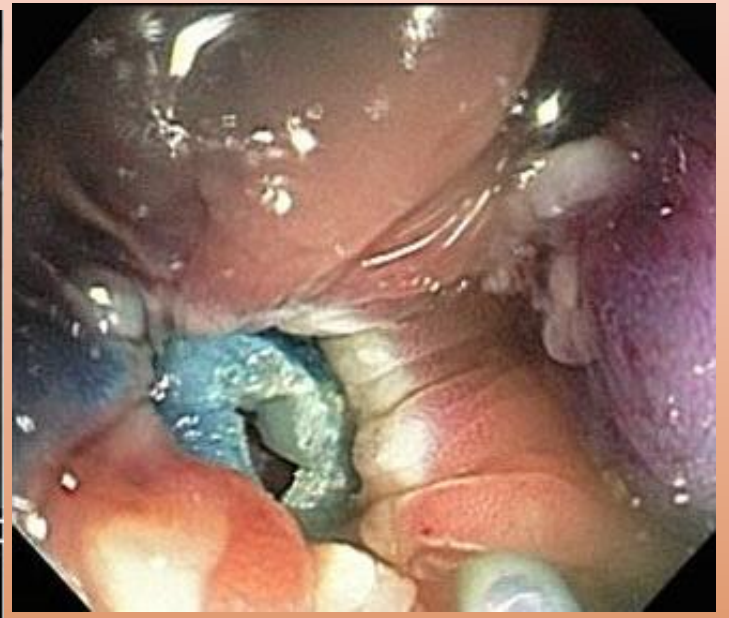
Visible fat



Recognition

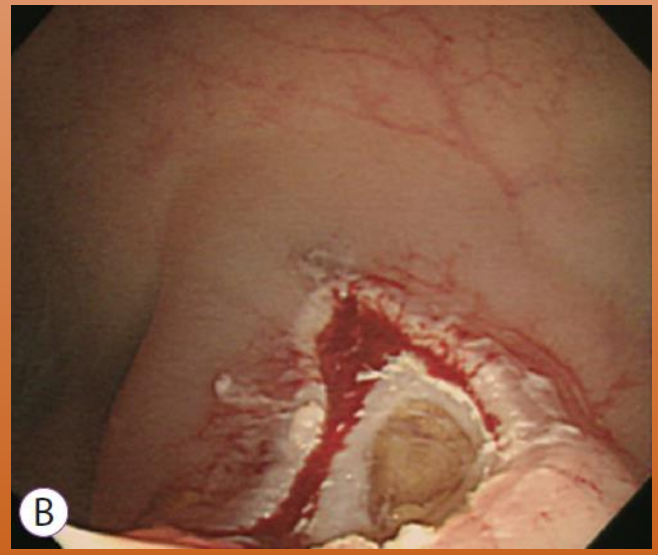
During colonoscopy:





See all bowel layers at edge of resection defect or in specimen

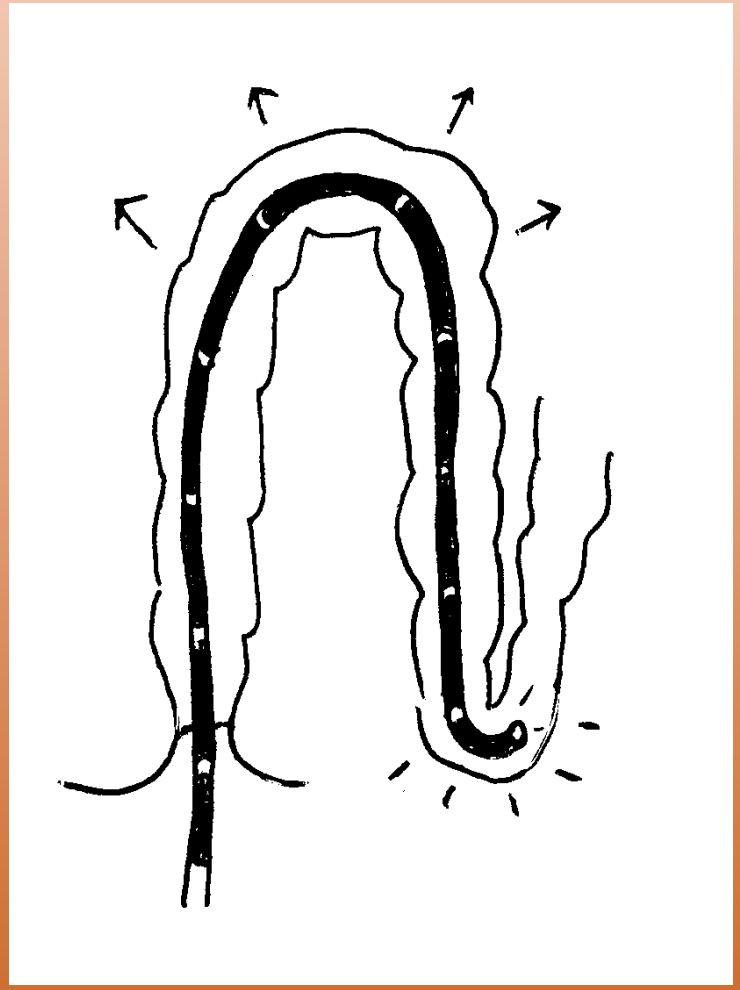
Sink-hole or deep crevice



Recognition

During colonoscopy:

Damage is not always at site of intervention, near scope tip. It may be caused by scope tube during intubation therefore seen during scope withdrawal



Recognition

After colonoscopy:

Persistent abdominal pain +/- peritonism +/- tachycardia

Pneumoperitoneum on imaging

Management .....1a. Confession

"The good news is that I did a thorough examination of your colon today, and it's perfect."

"So what's the bad news?"

Management .....1b. Be truthful

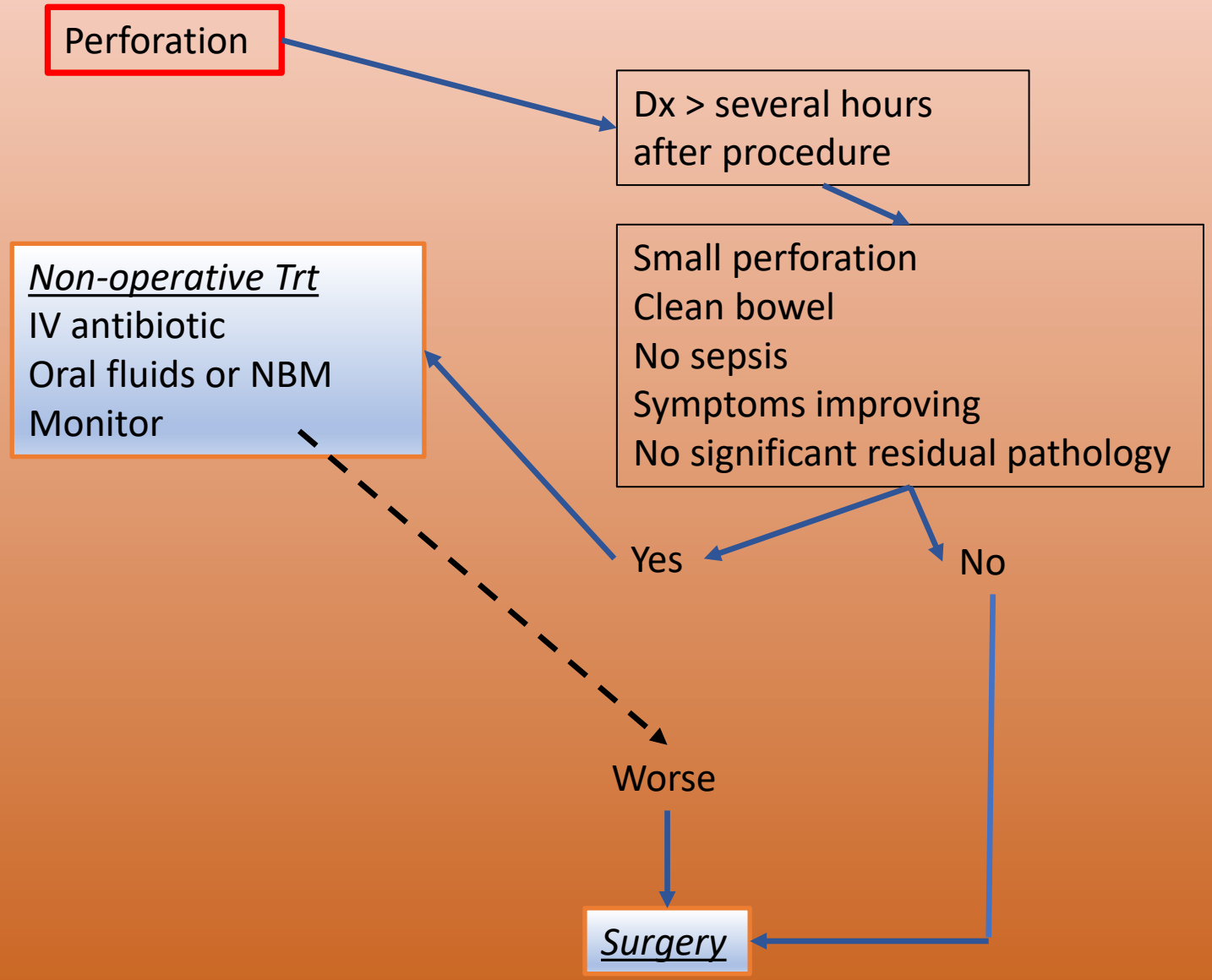
Management …….. 2. Of the hole….

Depends on….

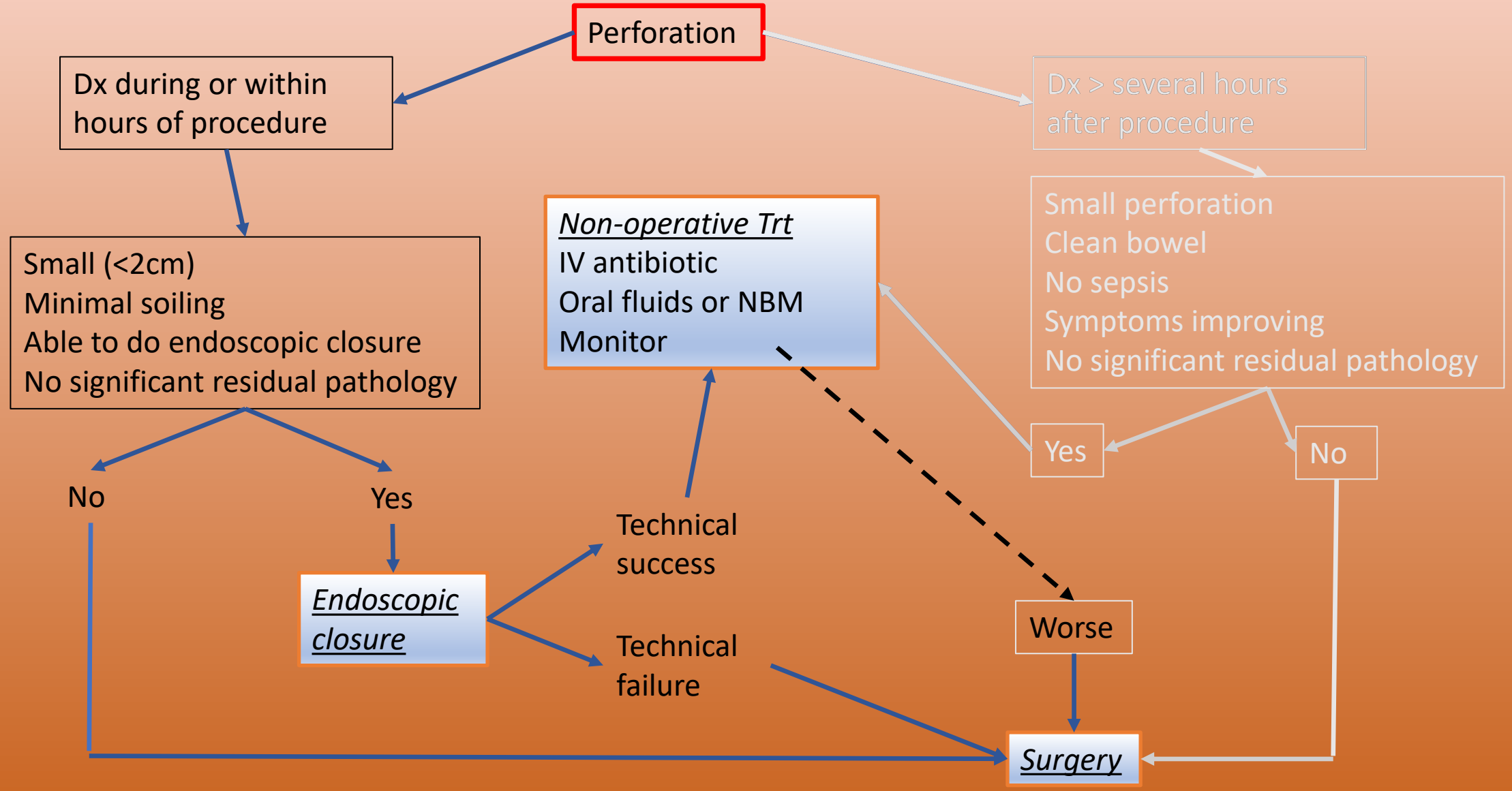
- **Technical** factors
  - Perforation cause, size and location
  - What is the residual pathology e.g. is there a cancer?
  - Endoscopic resources and expertise
- **Time from perforation to diagnosis**
  - Immediate/ within a few hours vs Next day or more
- **Soiling/ contamination**
  - Bowel luminal content
- **Patient condition**
  - Overall health
  - Sepsis

Management

OK…… That’s the theory.
What do I DO?



Kumar et al, J Dig Endoscopy 2018



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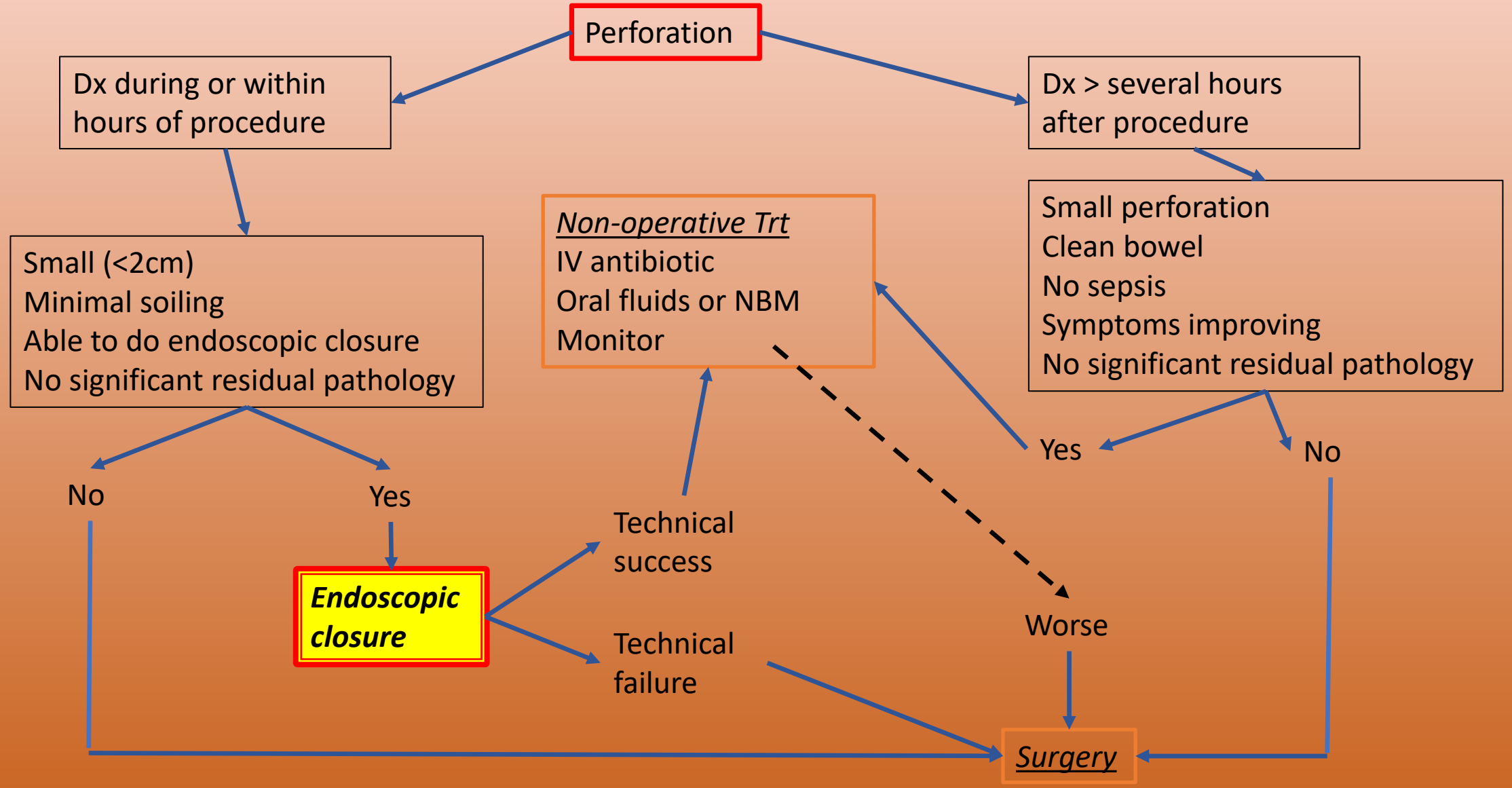


Kumar et al, J Dig Endoscopy 2018

Endoscopic Closure

I can do it….

Go for it, **but** …….

Endoscopic Closure

I can do it ….

Do not rush. Do not panic.

Put the scope down, and pre-plan exactly how to do it.

Get all your toys handy

Get assistance: one extra scope nurse will help a lot

Endoscopic Closure

I can do it….

Get good views- scope tip access, control bleeding

Beware prolonged gas insufflation increases pneumoperitoneum and patient discomfort

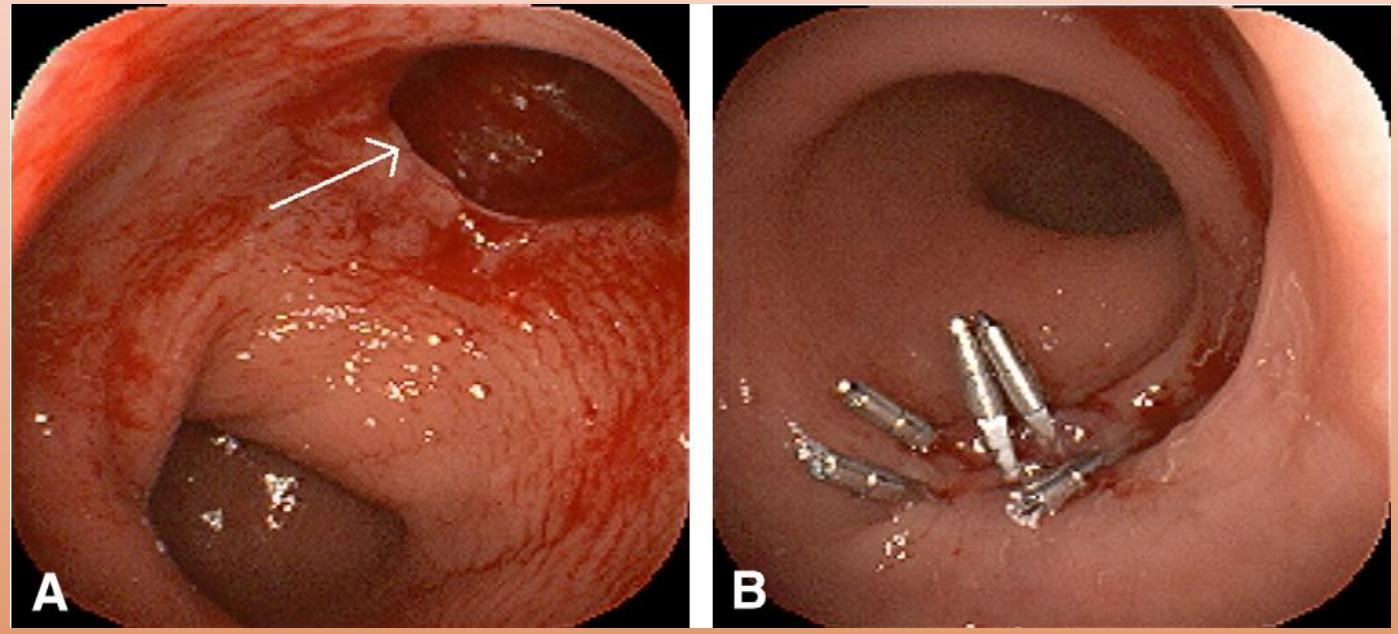
Endoscopic techniques

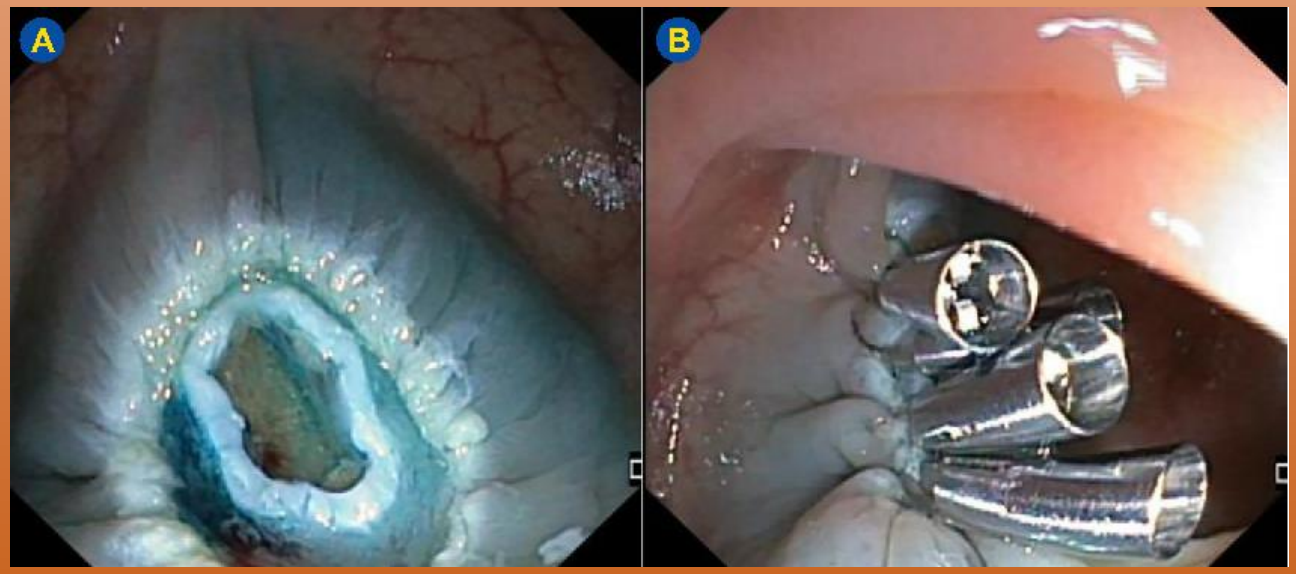
- Clip
- Suction Band
- EndoLoop
- Over-The-Scope Device
- Suture
- Covered stent
- Combination of above

Clips

Immediate deployment without scope withdrawal

Ideally use **type** that allows clip jaw rotation before deployment and multiple open-close attempts before firing *(Resolution 360 Clip, Boston Scientific)*

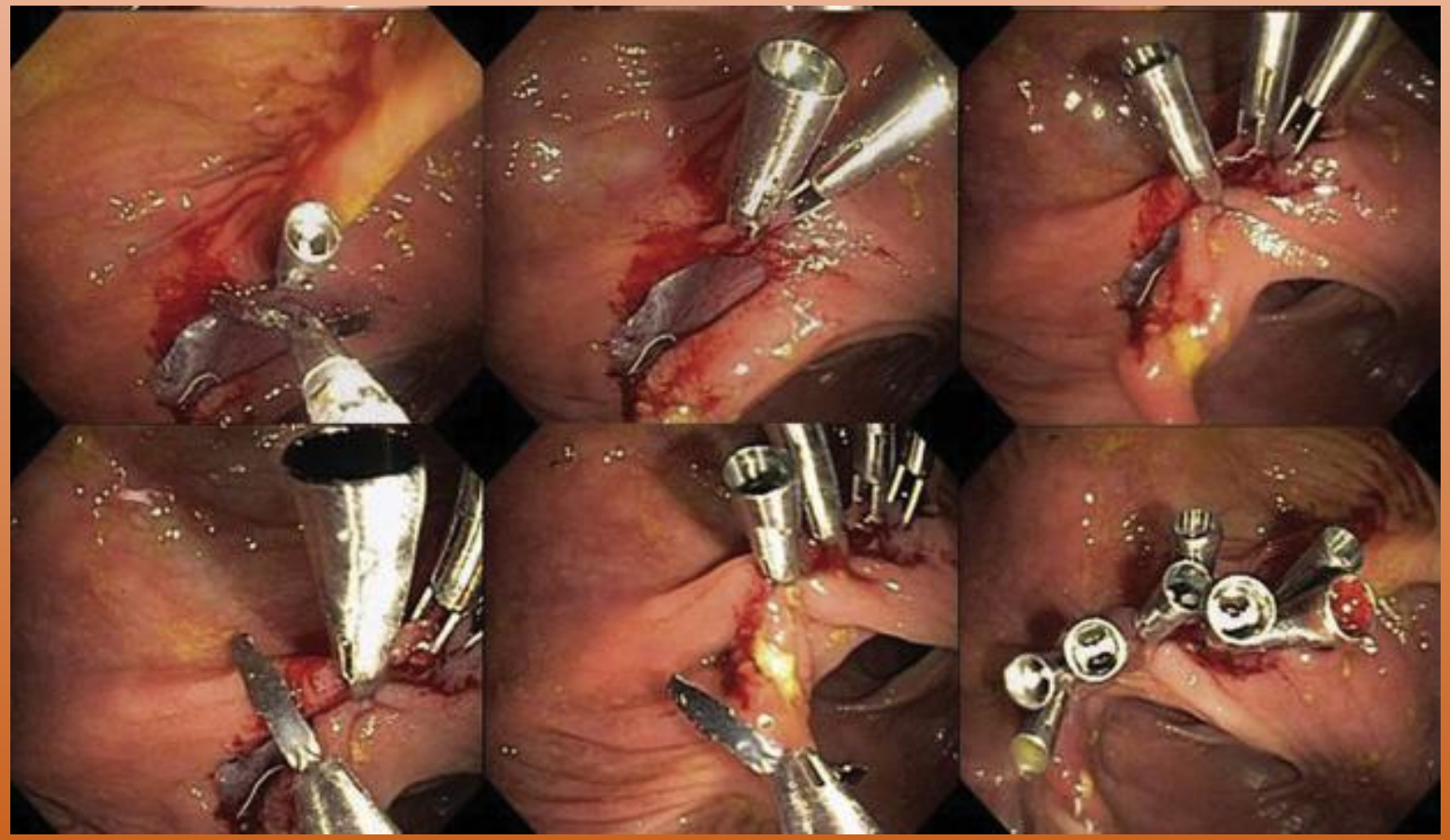




Clips

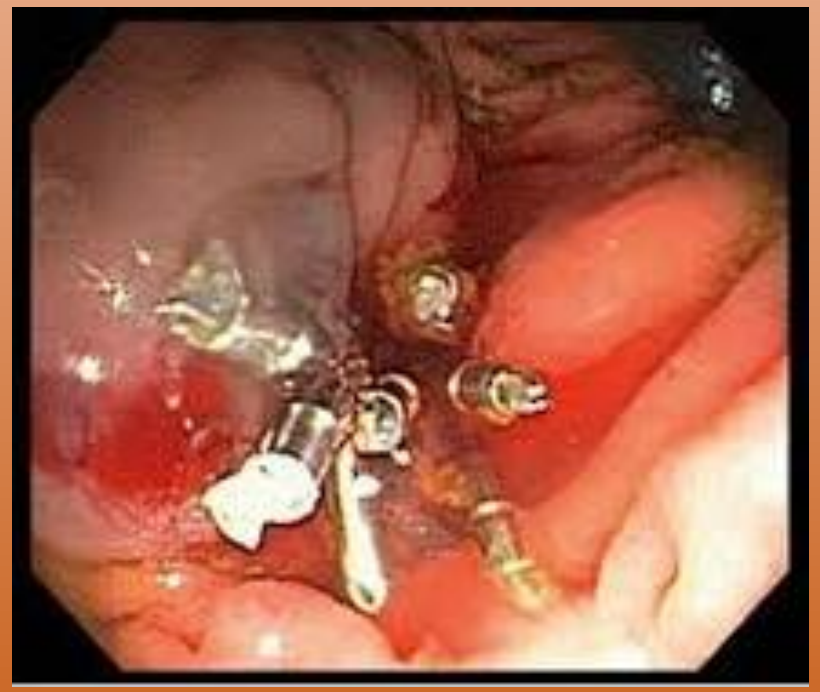
Pre-deployment plan ***exactly*** where to place clips and how to oppose perforation edges if wider than open clip width

Usually need more than one



Clips

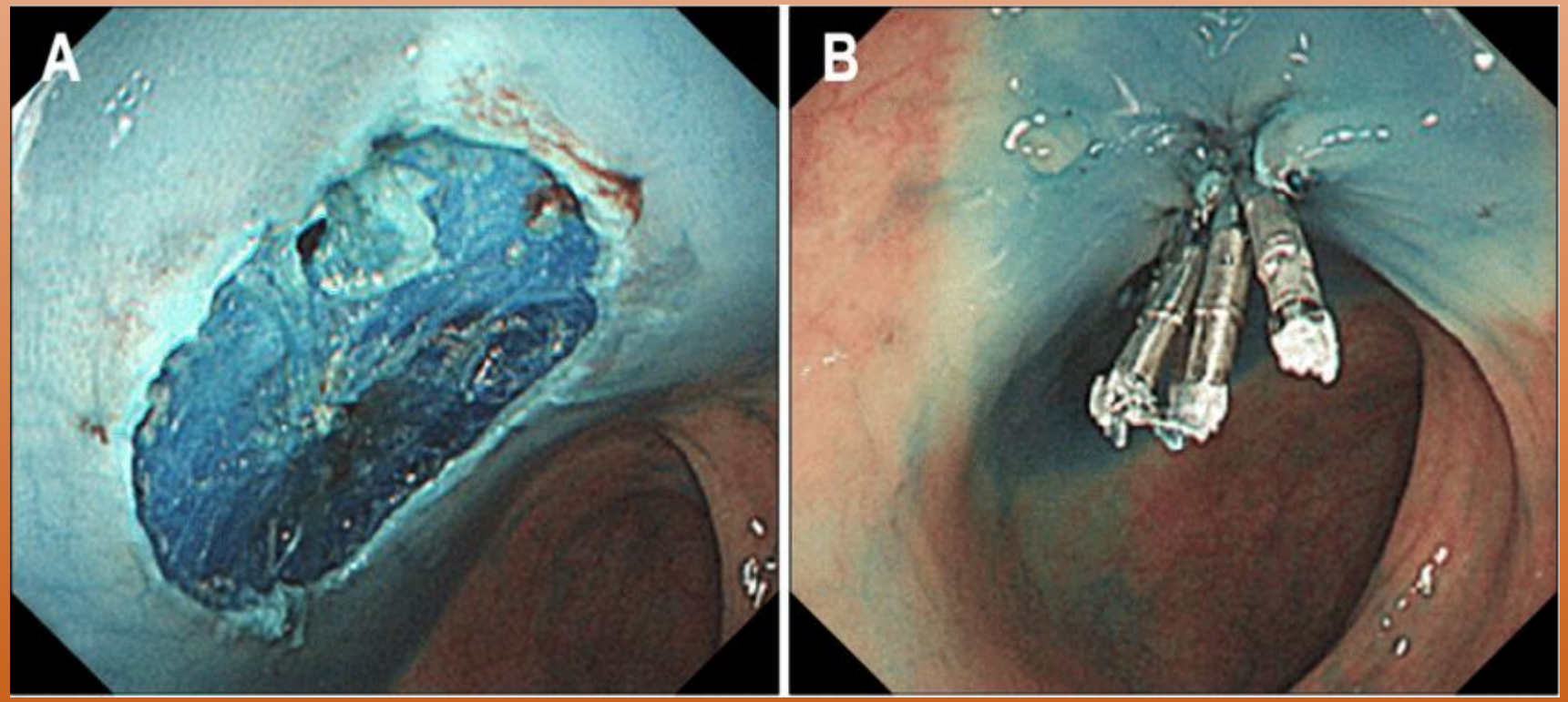
Clip placement can obscure further views/ access for subsequent clips



Clips

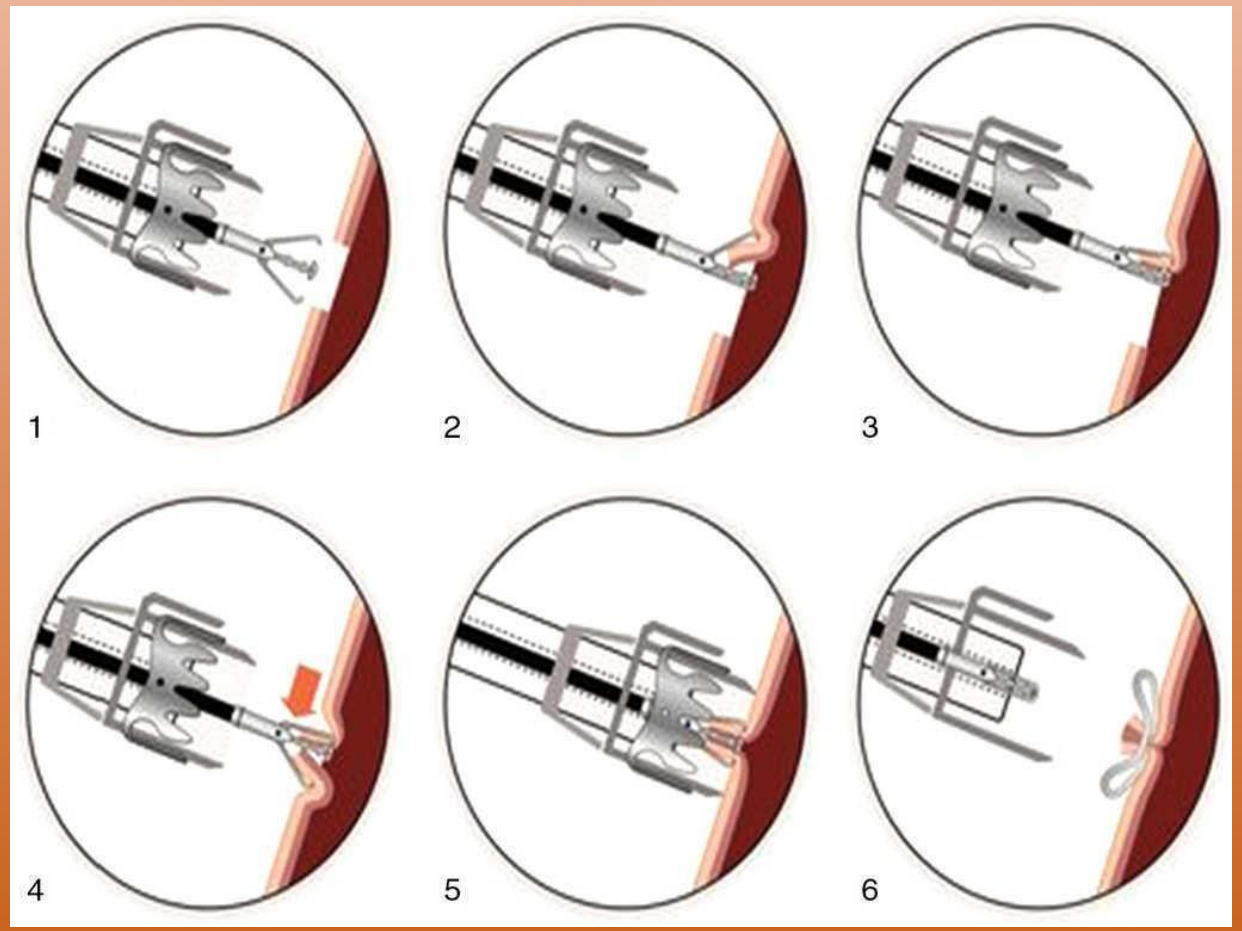
Best for full thickness closure but (animal studies show) mucosa and submucosa closure only is probably OK

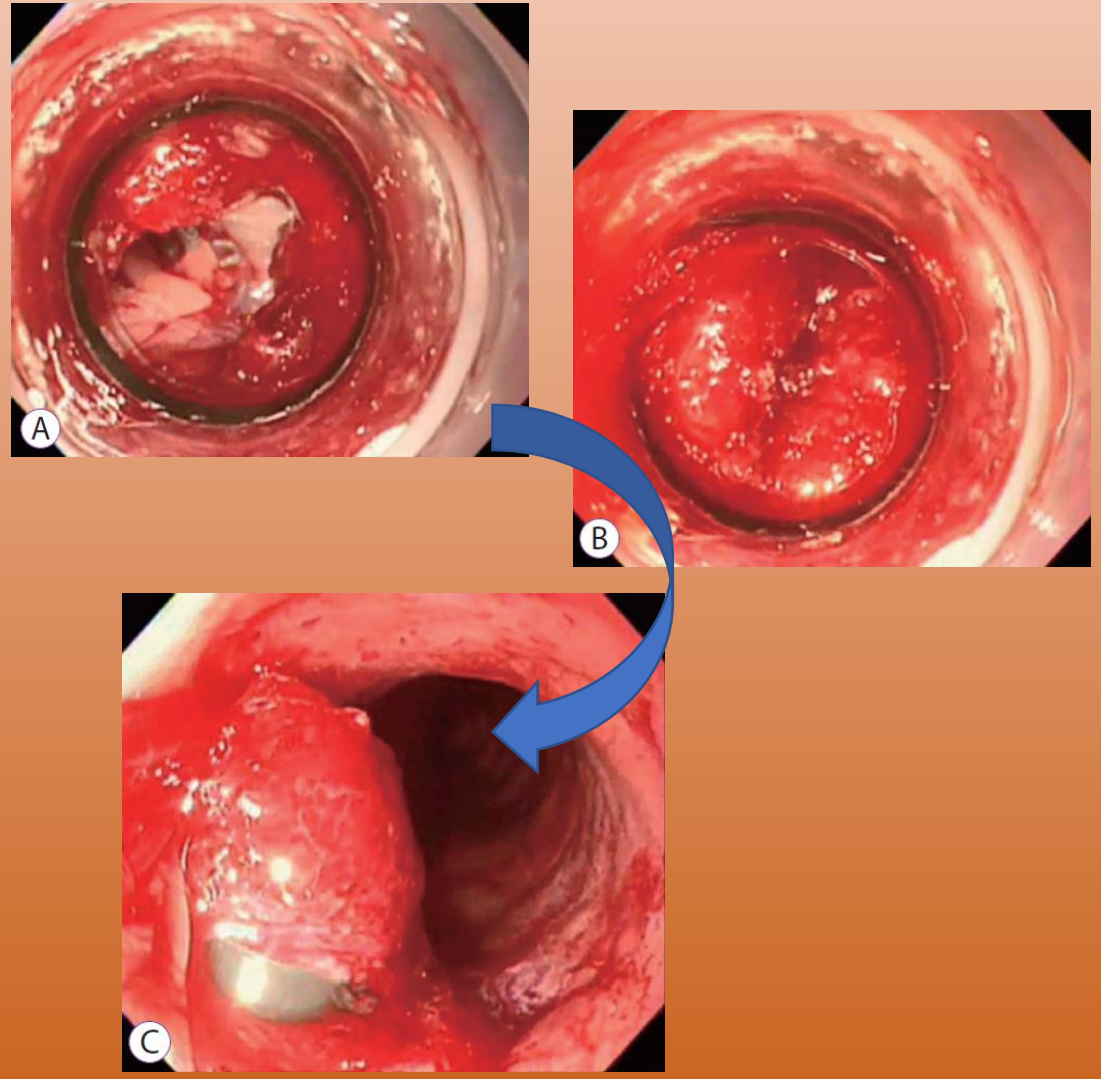
Ann. Coloproctology Vol 35 (5) 2016



Suction Band, Over-The-Scope Device, Endosc. Suture

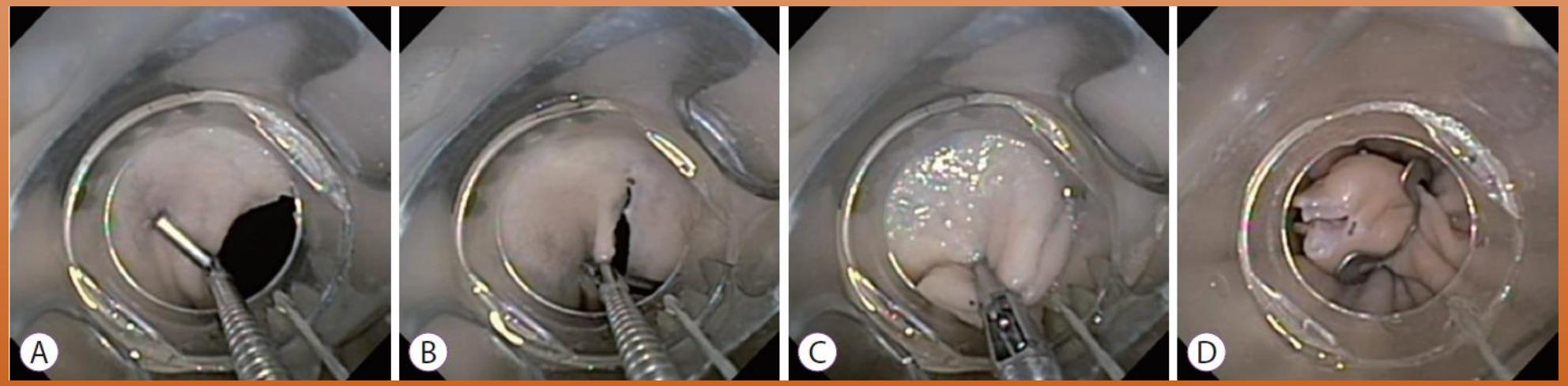
Significantly more **expertise** needed
Is the device **available**?





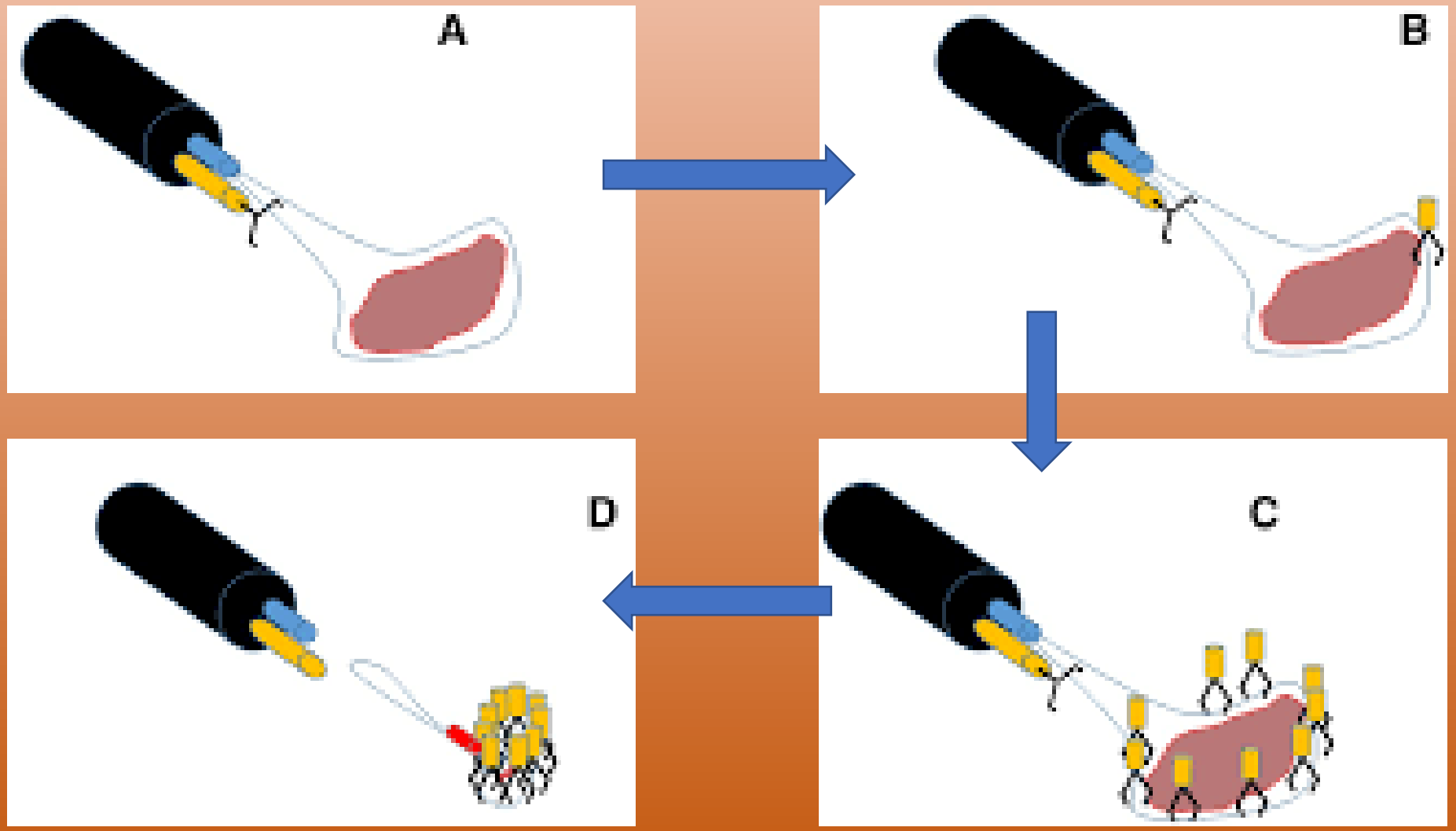
Suction Band, Over-The-Scope Device (Ovesco) , Suture

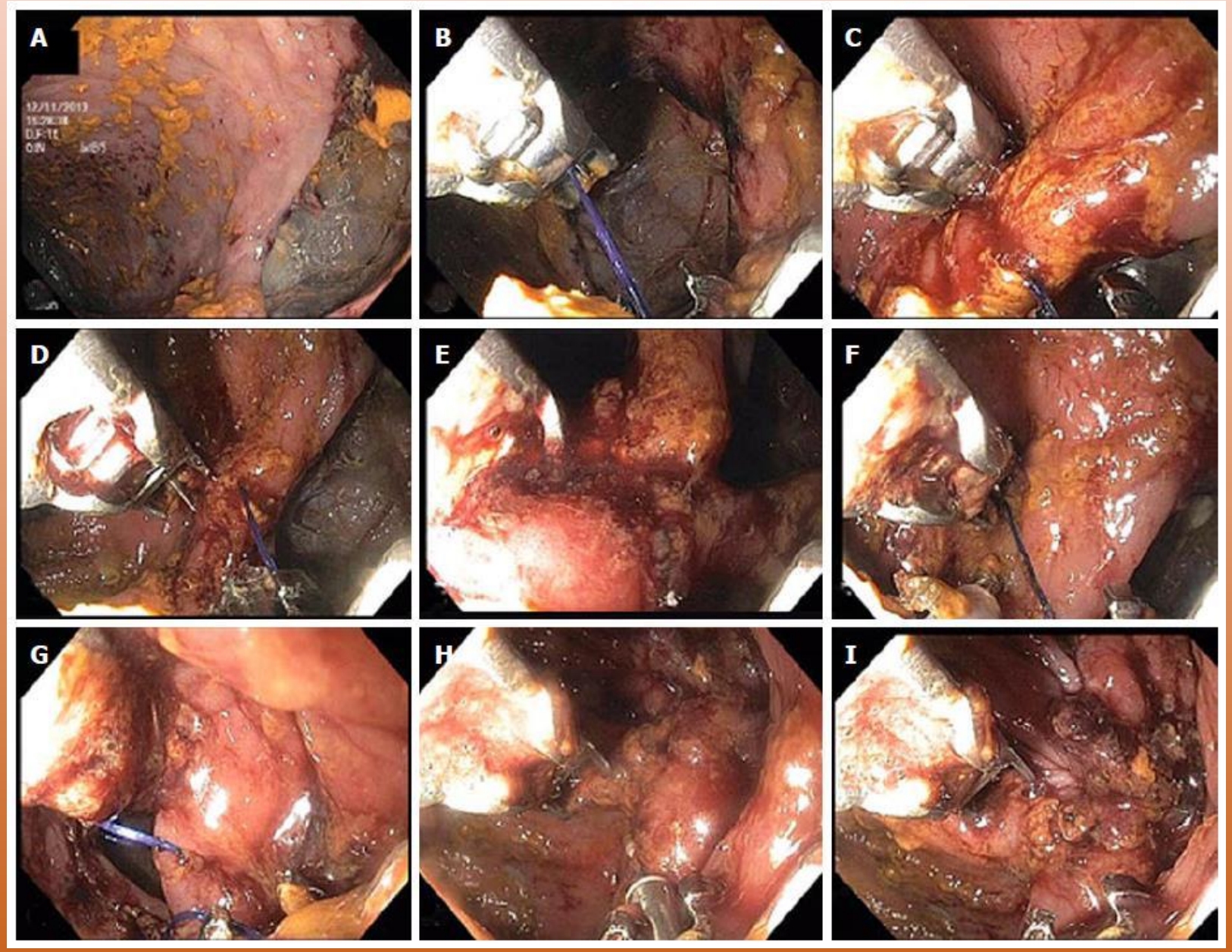
Need to **withdraw scope to fit device**: may struggle to find perforation again and/or prolonged gas insufflation compounds pneumoperitoneum and patient discomfort



Combination

Readily available toys but may need two channel scope and significant expertise





Endoscopic suturing

Significantly more expertise needed

Is the device available?

Covered stent

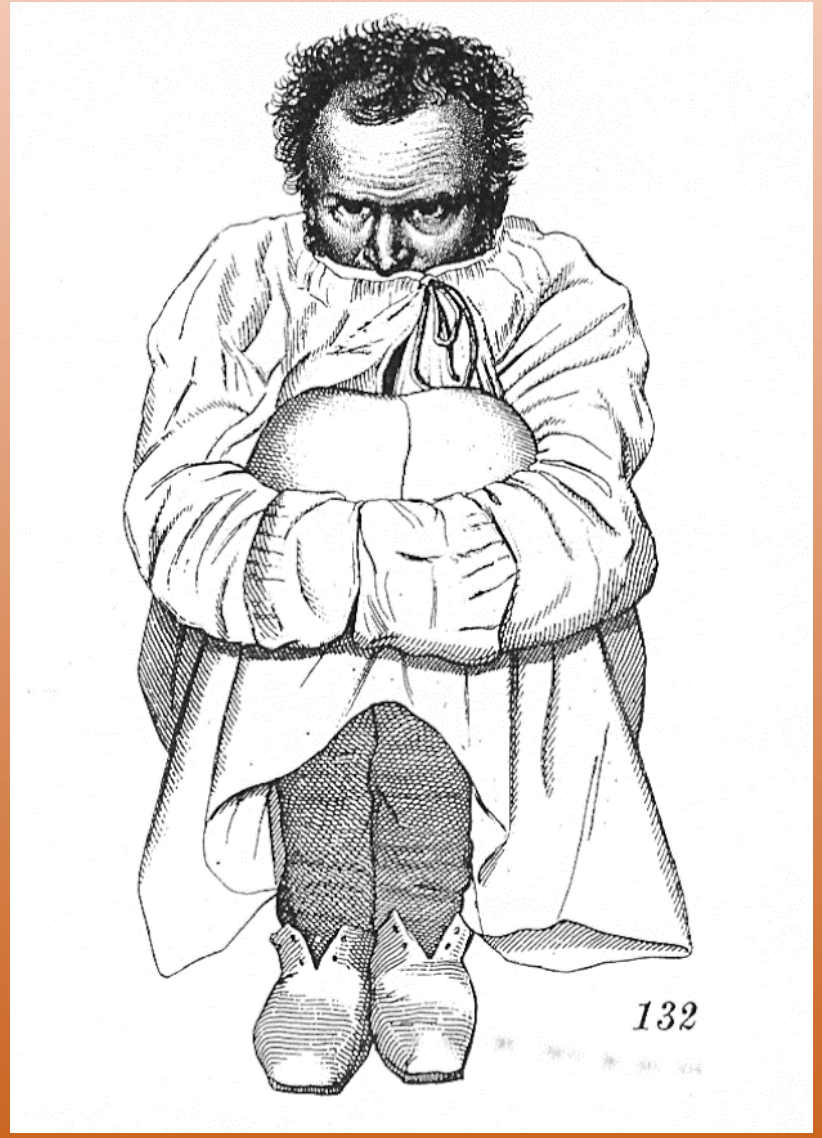
Anecdotal or animal study evidence

Through-The-Scope stent much easier to deploy than larger diameter deployment systems that cannot fit down scope channel

Stent ‘fit’ and migration problematic unless perforation site has pre-existing pathological narrowing

Potential stent removal issues if no surgical resection of pathology

Endoscopic Closure



I cannot do it….

Do not rush. Do not panic.

Put the scope down, and plan ….

1. Can I get **another endoscopist** now?
   …… If No …… then ……..
2. How to **mark the perforation site** to aid surgery
3. Arrange surgery
4. Extra considerations if patient was having a day-stay colonoscopy

Mark the perforation site to aid surgery

- Can be extremely hard to find perforation (esp. laparoscopically)
- Tattoo ink not visible on serosa or is sprayed all over peritoneal cavity
- EndoClips may be impalpable even at open surgery
- Retroperitoneal, intra-mesocolic colorectal, and posterior transverse colon wall perforations hard to find

Mark the perforation site to aid surgery

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Put guidewire (or scope!) well through perforation (at least 30cm) and tape external part to patient buttock

EndoClips and CT scan prior to theatre

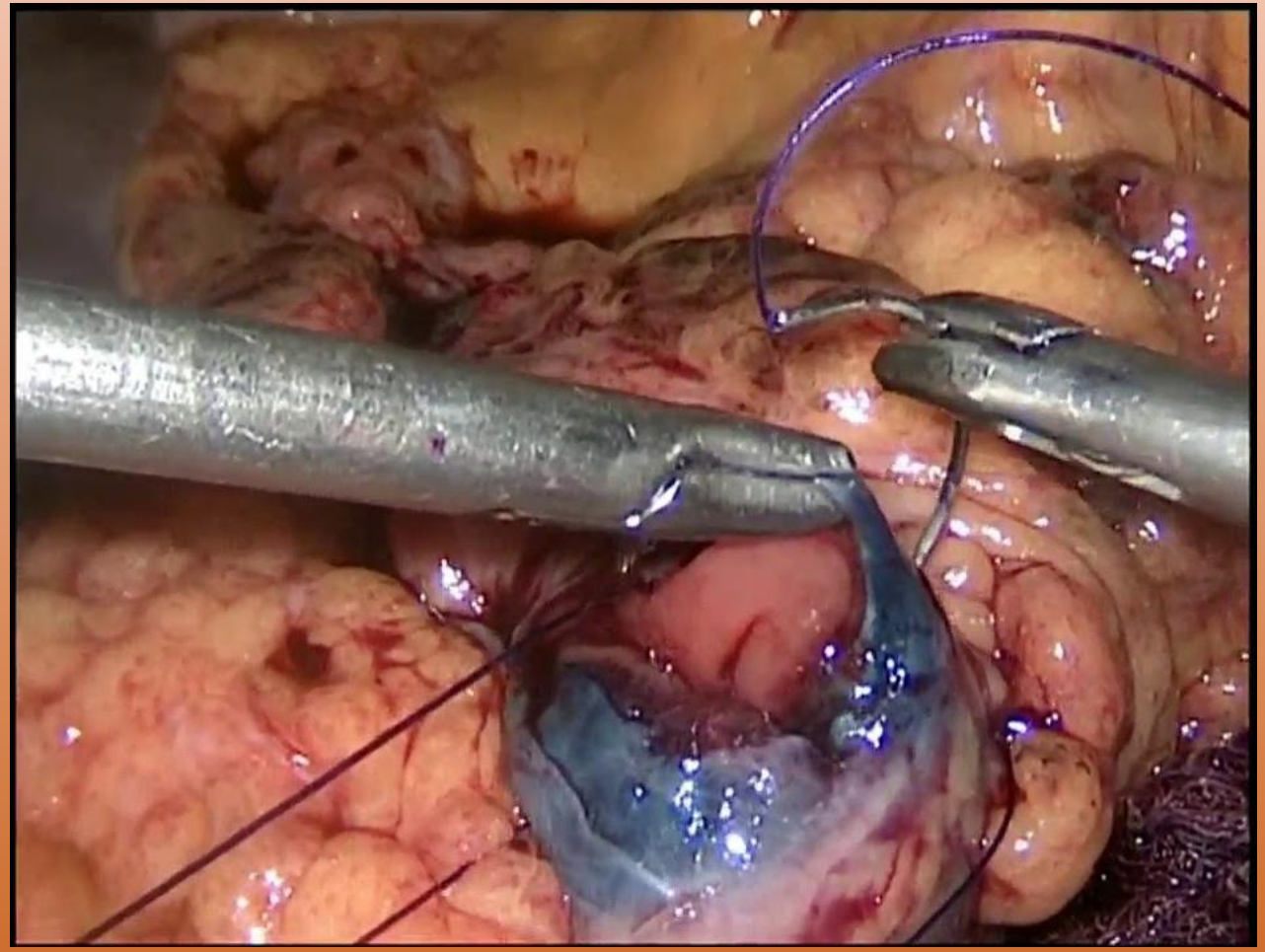
Surgery

Doesn’t matter whether laparoscopic or open technique

Find the hole and do something about it

Residual pathology?

Do I need to resect, place a drain or defunctioning stoma?



Surgery

Can’t find the hole:

Do not trust anatomic localisation by endoscopist

Intra-mesocolic
Posterior wall transverse colon- need to mobilise
More retroperitoneal mobilisation for right and left colon
Rectum
- Rectal mobilisation
- Trans-anal repair?