



Endoscopy- A practical Approach Mini Series

Session 3: Lower GI endoscopy and
cystoscopy

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Lower GI endoscopy

Lower GI endoscopy comprises proctoscopy, colonoscopy and ileoscopy.

Indications for lower GI endoscopy include:

- Chronic haematochezia
- Chronic faecal tenesmus
- Chronic large intestinal diarrhoea
- Colonic abnormality on diagnostic imaging
- Chronic small intestinal diarrhoea - esp. cats
- Distal small intestinal abnormality on diagnostic imaging

Contraindications for lower GI endoscopy include:

- Suspected or known colonic perforation
- Bleeding diathesis
- Patient unsuitable for anaesthesia

Equipment for lower GI endoscopy

The endoscope used for lower GI endoscopy may be the same scope as used for gastroduodenoscopy, but the diameter may limit the ability to perform ileoscopy in smaller patients.

Patient preparation

Traditionally, a cathartic solution is administered prior to lower GI endoscopy. The most common type of cathartic (e.g. 'Klean Prep') is based on polyethylene glycol (PEG), with added electrolytes to minimise net movement of water and electrolytes across the bowel wall. The PEG solution acts as an osmotic laxative and usually results in catharsis within 20 - 60 minutes of ingestion.

The administration of such solutions, however, can be difficult, stressful for the patient and presents a significant risk for regurgitation, vomiting and possible subsequent aspiration. Aspiration of a PEG solution results in a severe, potentially fatal aspiration pneumonia. Hyponatraemia is also a potential, but uncommon adverse effect.

Cathartic solutions are only used in dogs. If administered, I only give them to patients that will take them voluntarily, mixed with a little food.

Three doses (20mL per kg) are given at 6 to 8 hour intervals, starting the evening before procedure.

Unless contraindicated, patients should be fasted for 24 hours prior to lower GI endoscopy.

Phosphate enemas are NOT suitable for cats (may cause haemolytic crisis) but can be used in dogs, though the results are inferior to PEG cathartics.

In our hospital, we usually administer a warm saline enema to dogs and cats prior to lower GI endoscopy. This can be done once, while the patient is under GA just prior to the endoscopy. Even with one administration and no prior catharsis, we usually get excellent results. This causes no distress for patient and as the solution is isotonic there should be no electrolyte derangements.

Saline enema technique:

- Warm one litre saline bottles to just above body temperature (39 to 40°C)
- Coil as much suction tubing into bottle as possible
- Connect soft suction catheter tip to free end of tubing
- Hold bottle above head height
- Kink end of suction tubing
- Pull tubing rapidly out of the bottle until only the tip remains at the bottom of the bottle
- Release the kink → flow



Tubing coiled in bottle of saline



Soft suction catheter for enema administration



Enema administration

Saline enema volume:

Essentially, continue the enema until the returning saline is clear -
Always ensure ongoing egress of saline through anus to prevent over-distension.
We use approximately 1 litre per 10kg.

It is important to ensure that the saline is at the correct temperature or excessive patient cooling (or warming) can occur.

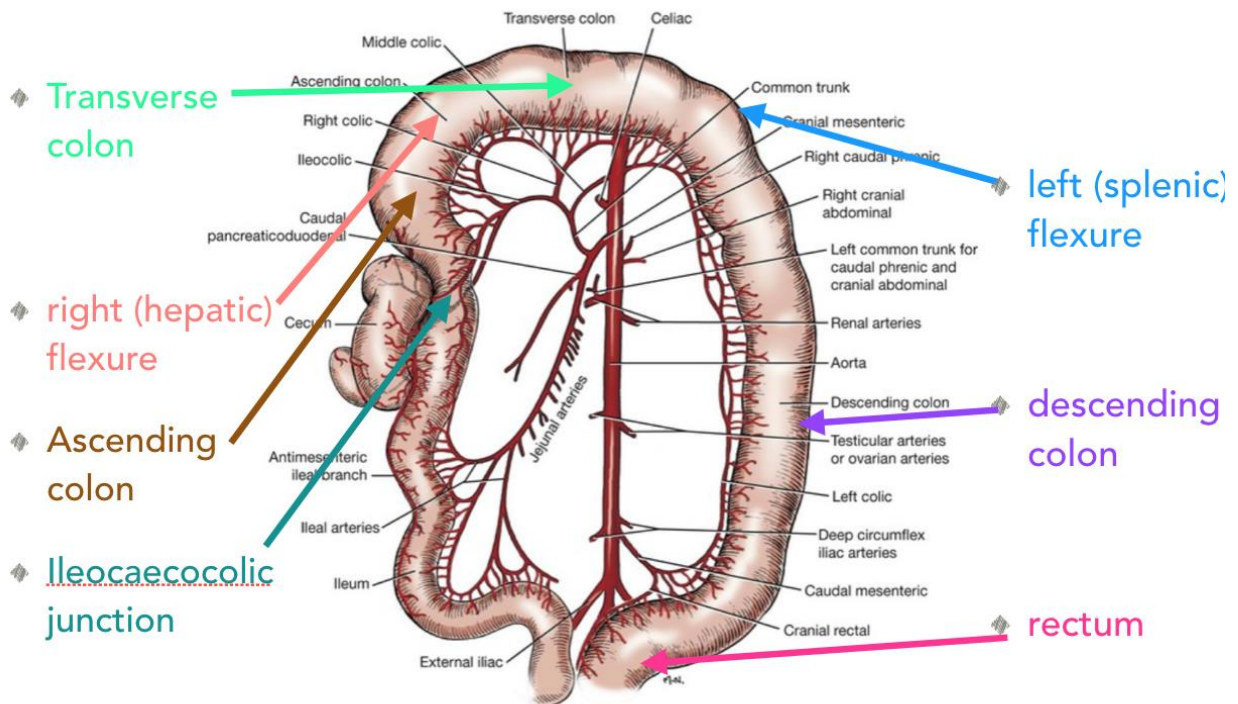
Colonoscopy & proctoscopy

The patient is anaesthetised and positioned in left lateral recumbency (same as for UGI scope) – this means that the ileocolic junction (on right side) is non-dependent and therefore should contain gas rather than liquid.

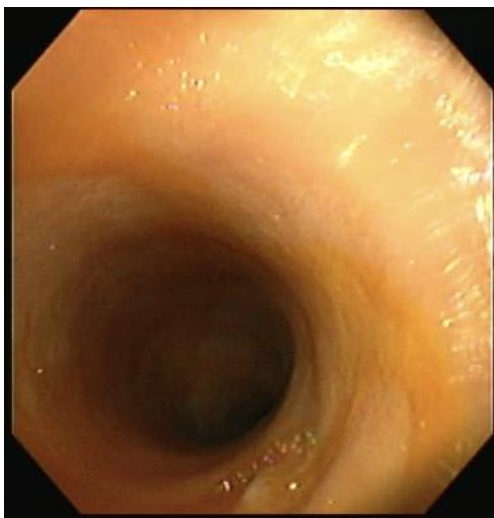
Colonoscopy/proctoscopy procedure:

- Lubricate endoscope
- Start recording endoscopy video
- Push tip of scope through anus
- Insufflate gently
- Suction out residual fluid
- Manoeuvre scope to keep central in lumen

Landmarks of lower GI tract:



As you gradually advance the scope, keeping the lumen central, the colon should appear smooth and pink with few blood vessels visible.



Normal colon

On reaching the first (splenic) flexure, steer the scope around into the transverse colon and then the next flexure is the hepatic flexure, after which lies the ileocaecocolic junction.

It is very important to correctly identify the ileocaecocolic junction - if you miss it then you may end up in the blind-ending caecum and will find that you cannot see the lumen ahead. It is important therefore not to advance the scope blindly.



Normal ileocaecocolic junction

The caecum is examined, by gently passing the scope in, flushing out tenacious material and gently insufflating.

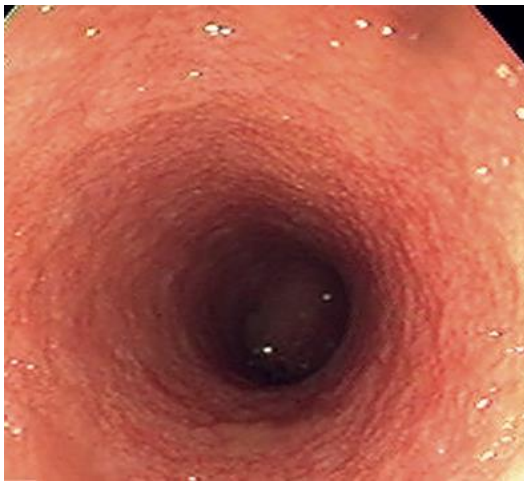
After examining the mucosa, the air is suctioned out.

The ileocolic valve is usually closed on examination but periodically, liquid faecal material may pass through. Cannulation of the ileocolic valve, passing the scope through into the ileum is usually achievable in dogs and sometimes achievable in cats.

Ileal cannulation may be performed directly by keeping the ileocolic valve central and applying gentle pressure while advancing scope, insufflating a little as you go. An obvious 'small intestinal appearance' to mucosa confirms success. As there is inevitably 'red-out' while passing through, the scope can easily slip into caecum instead – where the mucosa appears similar to colon.



If direct ileal cannulation cannot be performed, the biopsy forceps can be used as a 'guidewire' for cannulation. Again, keeping the ileocolic junction central, pass the closed forceps through the ileocolic valve. Then apply gentle pressure while advancing the scope along the forceps, keeping the forceps still (& closed).



Normal ileum

If you cannot pass the scope through the ileocolic junction then pass the biopsy forceps through and take a few biopsies blindly (re-positioning each time).

Colonic biopsies are taken using a similar technique to the small intestine, but it is usually easier to get perpendicular to colon wall. Aim for 6 - 10 biopsies. We usually take the biopsies as the scope is incrementally withdrawn by a few centimetres or so at a time.

Following biopsy, minimal bleeding should be seen.

Protoscopy is specifically endoscopic examination of the rectum. In larger dogs, this is performed by retroflexing the endoscope when withdrawing after colonoscopy – this allows examination of the region of rectum missed when the scope is first passed into the patient.

It is sometimes necessary to pinch the anus closed to allow effective insufflation.

Normal rectal mucosa appears smooth, pink with more tissue folds than the colon. There should be few visible blood vessels, no mucosal haemorrhage and minimal bleeding after biopsy.



If using a larger endoscope, it may accommodate larger forceps (2.8mm), which result in larger, better quality biopsies.

Colonoscopy complications are uncommon, but perforation may occur.

Urethroscopy & cystoscopy

Indications:

- Persistent/Recurrent LUT signs
- assesses for masses, strictures, uroliths
- Persistent/ Recurrent UTI
- assess anatomy, masses, uroliths,

Contraindications:

- Bleeding diathesis
- Unsuitable for GA
- Lack of experience
- Lack of correct equipment
- Acute non-obstructive presentation

Patient suitability:

Some form of cystoscopy is possible in most cats & dogs but it requires a range of different types & sizes of scope to accommodate all patients.

Rigid endoscopes are limited to use in female patients, unless a temporary perineal urethrostomy is performed to allow access in male dogs.

Flexible scopes may be used in male patients, but the diameter may limit the use of endoscopic instruments.

For female dogs up to 15 - 20kg a 2.7mm diameter 18cm long 30 degree viewing angle rigid cystoscope is usually suitable. This should be long enough to see into the bladder. Using an 'operating sheath' around the 'telescope' allows for inflow and outflow of saline, as well as passage of instruments.

Female dogs > 15-20kg may accommodate a 3.5mm diameter, 30cm long rigid cystoscope – a shorter scope may not reach the trigone.

Female dogs <5kg and cats require a 1.9mm diameter scope, and might not accommodate an operating sheath with a biopsy channel.

Additional equipment required for rigid cystoscopy:

- light cable
- Xenon light source
- camera to connect to eyepiece
- image processor
- Warm 0.9% saline, pressure bag and infusion set

Male dogs may have cystoscopy using a flexible cystoscope / ureteroscope (e.g. Flex XC) (70cm length, 8.5 French (<3mm) insertion tip).

Cystoscopy of male cats is very limited due to the very narrow urethra. Though a 1.2mm flexible cystoscope (fiberoptic – not videoscope) may allow cystoscopy, this will not accommodate a biopsy or flushing channel.

For cystoscopy set-up, the patient should be under general anaesthesia and in dorsal recumbency (usually in a trough).

In females, the perineal/ perivulvar area should be clipped and prepped with chlorhexidine and then the vaginal vestibule should be flushed with 0.05% chlorhexidine solution (25mL chlorhexidine in 1 litre of sterile saline).

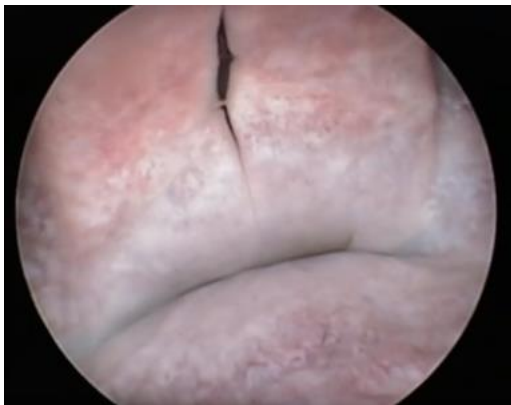
A sterile fenestrated drape should be placed over the area.

For males, the positioning is similar, and the peri/preputial area should be clipped and cleaned with chlorhexidine, then the preputial space should be flushed with 0.05% chlorhexidine solution.

A sterile fenestrated drape is placed over the area.

To perform rigid cystoscopy in female dogs:

- Lubricate the scope with sterile gel
- Pull vulva caudally
- Insert scope with other hand, closing vulva around it
- Start saline flow and examine as the vestibule fills with saline
The urethral orifice is seen 'dorsally' and the vagina 'ventrally'.

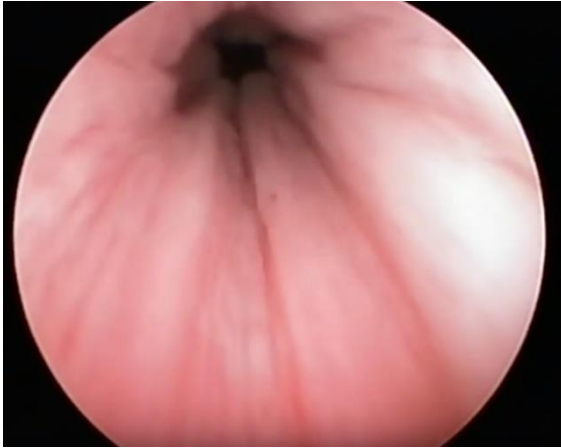


Urethral ostium above vagina

- Continue by passing the scope through urethral ostium into urethra
Because of the 30 degree viewing angle, you need to keep urethra in the bottom 1/3rd of image screen to prevent scraping along dorsal urethral wall



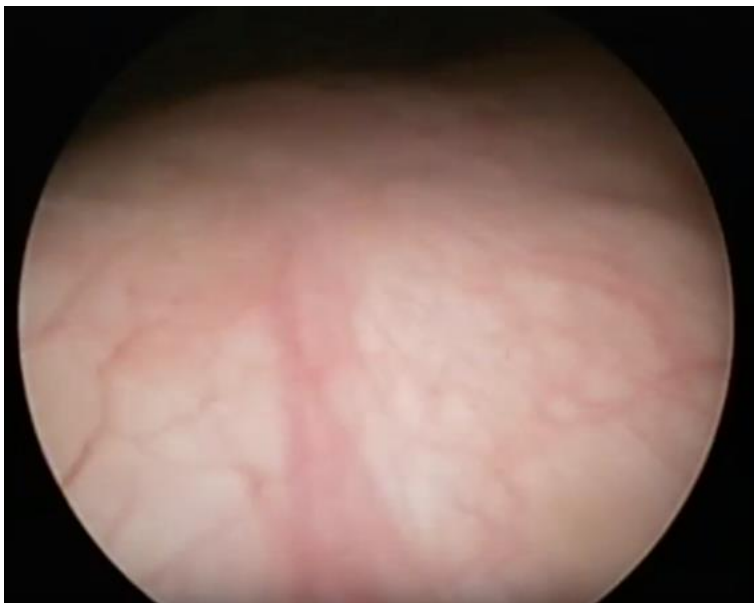
Normal urethra



Proximal urethra/bladder neck

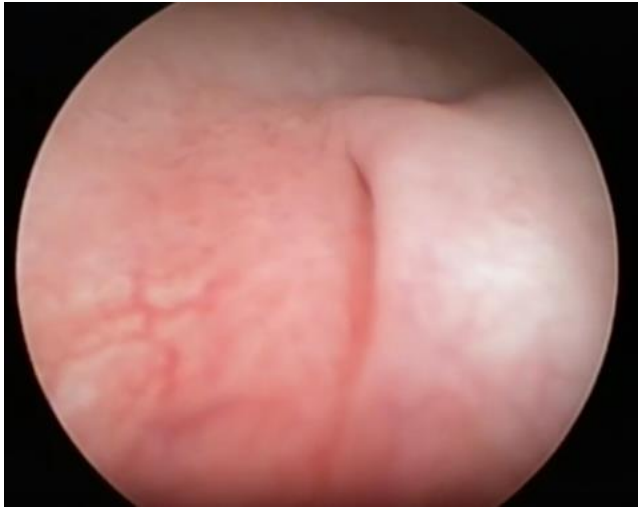
- assess for ectopic ureters in the proximal urethra
- Upon entering the bladder, open egress port on cystoscope
- allow to drain completely
- then flush in saline to re-fill
- repeat if necessary to obtain clear view
- Rotate scope sheath 180° to point scope tip angle downwards – ureteral orifices appear at the bottom of image

The normal bladder mucosal appearance is pale pink, smooth and mucosal vessels are easily seen. There should be no nodules and no bleeding.



Normal bladder mucosa

The normal ureteral orifices are seen as slightly raised 'hillocks' on the dorsal wall of the trigone with a C-shaped ureteral orifice. It is possible to see ureteral jets as urine appears refractile when mixing with saline.



Normal ureteral orifice



Normal prostatic duct orifices in male urethra – do not confuse with ectopic ureteral orifices.