Development of a minimum dataset for MRI reporting of anal fistula: A multi-disciplinary, expert consensus approach

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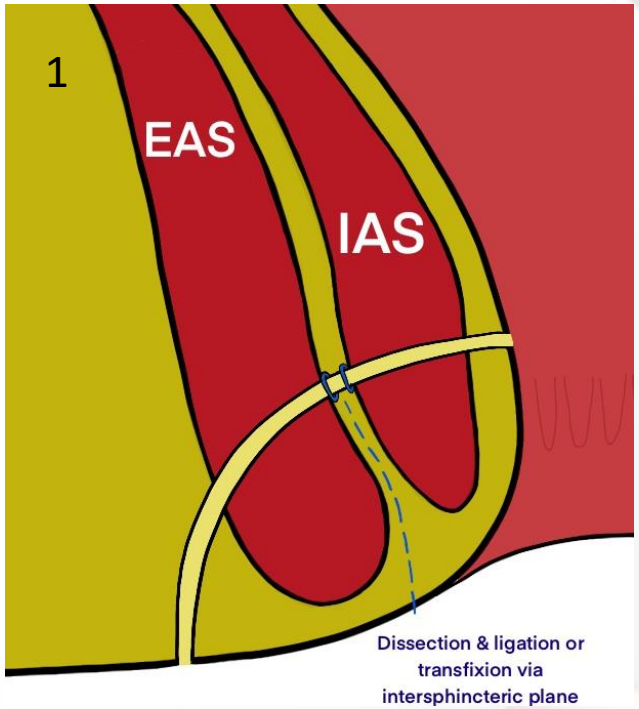
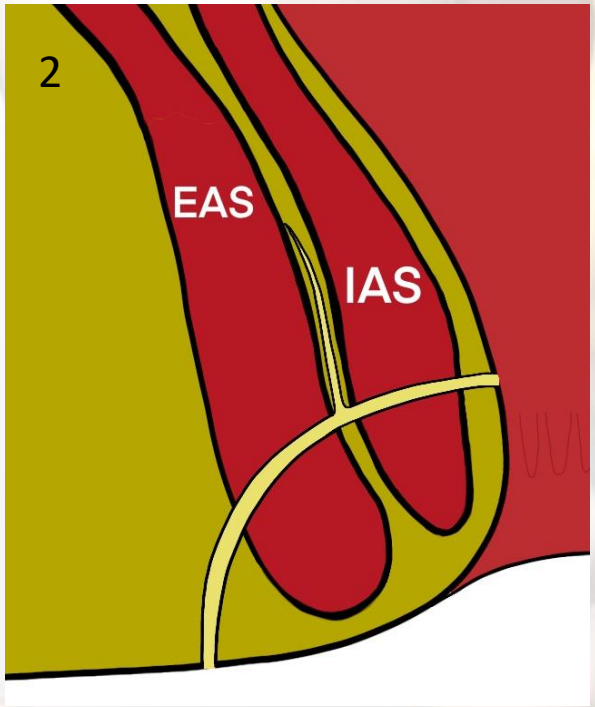
Background

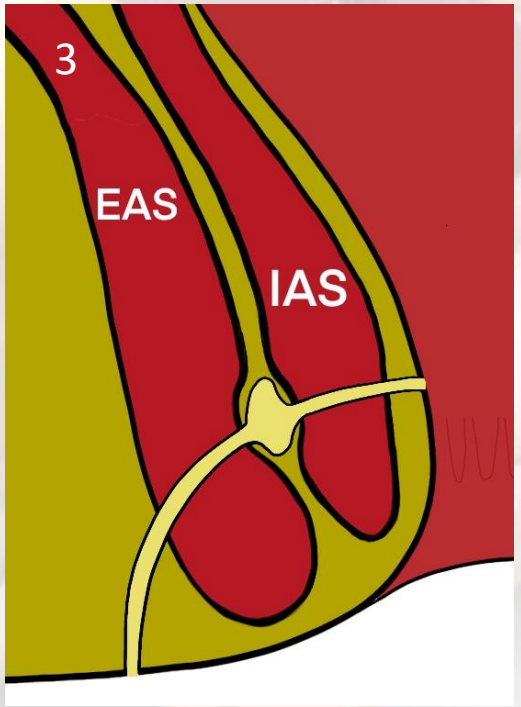
- MRI is the gold standard modality for assessing anal fistula
- There are multiple Sphincter Preserving Procedures (SPPs) available to treat anal fistula
- Some procedures can be precluded by specific features of fistula anatomy...

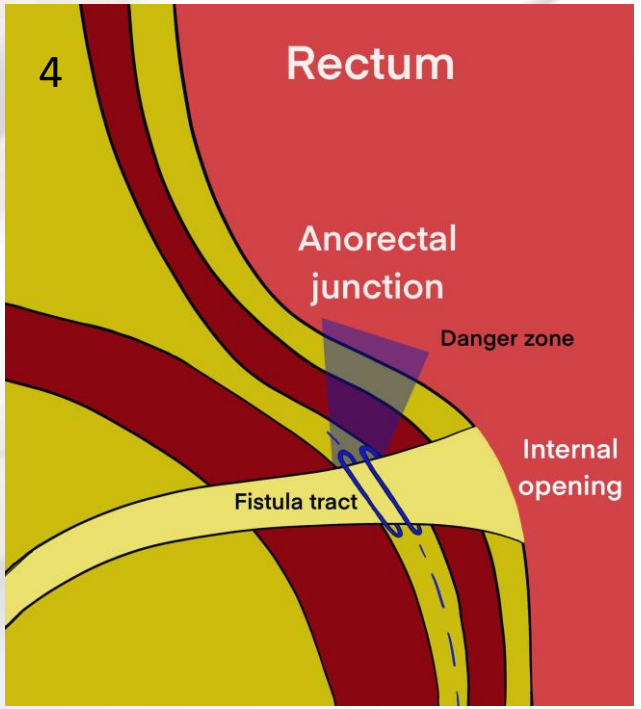
Example: Ligation of the Intersphincteric Fistula Tract (LIFT)

- Procedure: Dissect and ligate intersphincteric portion of tract (1)
- Precluded by (2) Intersphincteric extension, (3) intersphincteric collection, (4) high tracts with internal opening near anorectal junction (risk of entering rectum during dissection)



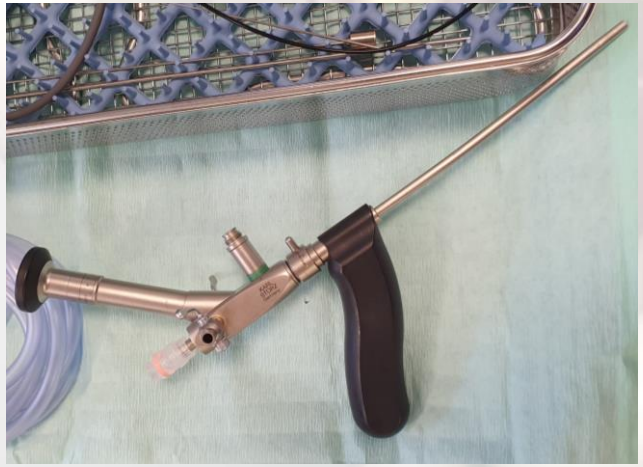


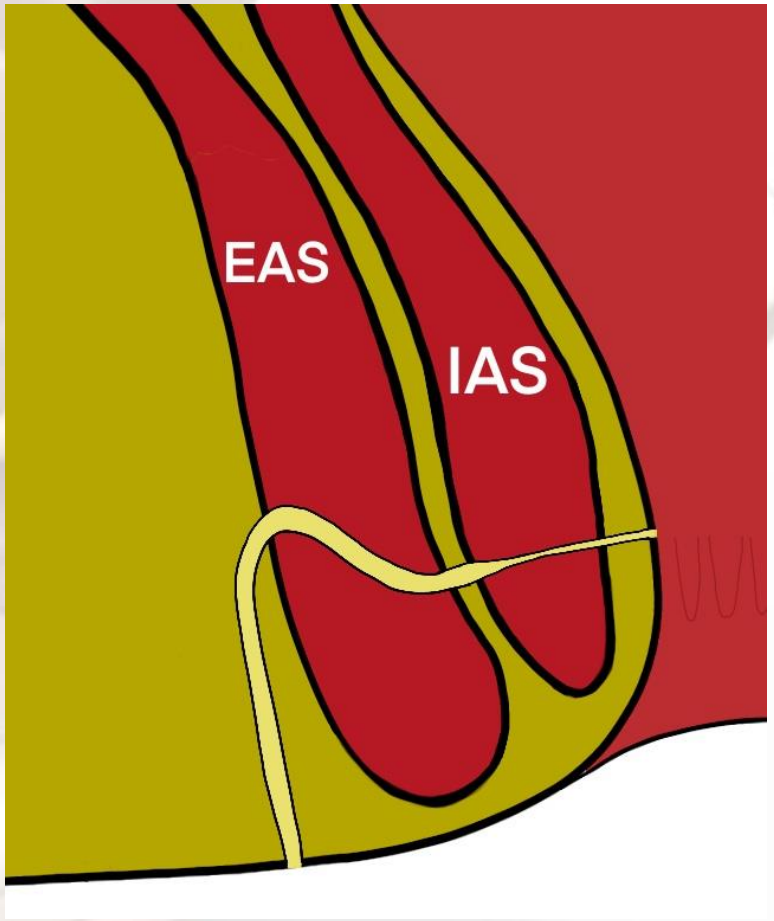




Example: Video Assisted Anal Fistula Treatment (VAAFT)

- Tract is cannulated with a rigid 3.7 x 4.4mm scope
- Challenging to negotiate tight & successive angulations
- Challenging to cannulate very narrow tracts





Aim

- To maximise clinical utility, the MRI report should accurately describe clinically relevant features

Aim: To develop a minimum dataset for MRI reporting of anal fistula

Methods

3 stage process:

- **Systematic review** of recommended features to include in MRI reports

- **Nationwide clinician survey** to understand the anatomical features that shape clinical practice

- **Multi-disciplinary expert consensus panel** to determine the final minimum dataset through anonymous voting

Results: Systematic review

- 26 publications
  - Majority narrative reviews
  - 3 studies described structured MRI reporting templates
  - Perianal Crohn's Disease activity scores
- Longlist of items revised in iterative process- duplications excluded, others added

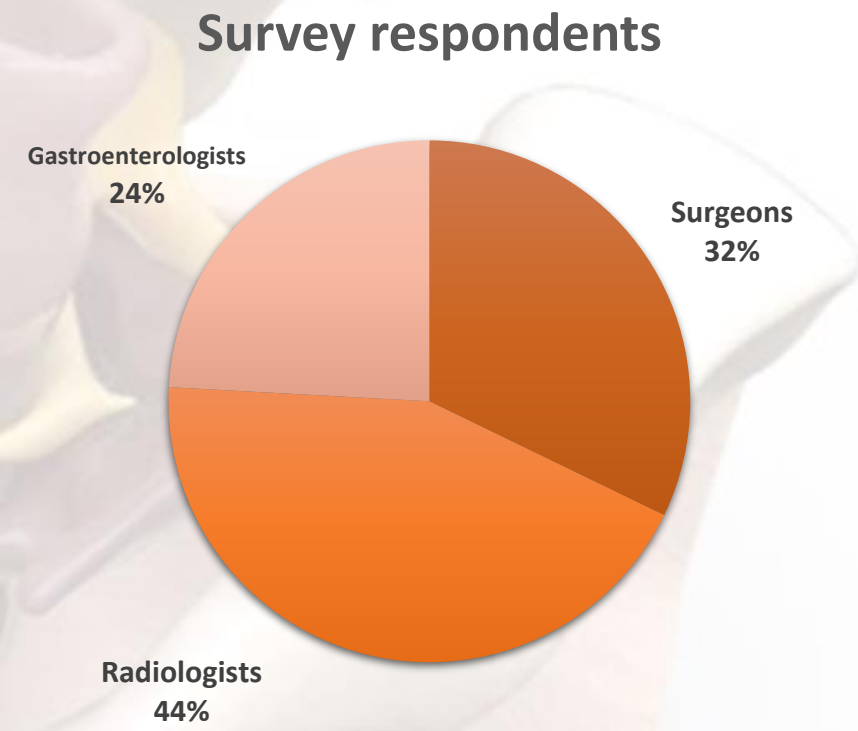
- 70-items presented in clinician survey

Results: Clinician survey

- 87 complete responses

- Clinicians identified features that should:
  - Always be reported
  - Reported if remarkable/ relevant
  - Never report

- Results informed expert consensus panel
  - 6 radiologists, 5 surgeons, 3 gastroenterologists determined the final minimum dataset…



The final minimum dataset

- Key features that guide decision-making for all specialties
- Separate surgical and perianal Crohn's Disease subsets deduced
- Minimum dataset for MRI request deduced

Feature	Always report	Report if remarkable or relevant to clinical scenario
Classification	• Parks classification subtype	
General characteristics	• Number of tracts • If tract is single, single-branched or multiple	
Internal opening	• Anal clock location • Height in upper/ middle/ lower thirds of anal canal* • If internal opening is anal or rectal • Number of internal openings	• Diameter
Path of the fistula tract through the sphincters	• Location where tract crosses EAS or Puborectalis • Height that tract crosses EAS or Puborectalis in upper/ middle/ lower thirds of anal canal*	• General characteristics of IAS/ EAS • Course of IS fistula through IS space
External opening	• Anal clock location • Anatomical location (e.g. gluteal, labial)	
Extensions	• Presence of extensions, even if absent • If extensions are single or multiple • Anatomical location • Location relative to Levator Ani (supra/ infralevator) • Location of point of communication to primary tract • Shape (e.g. horseshoe, blind tract)	• Description of course of extensions
Collections	• Presence of collections, even if absent • Connection to the primary tract • Anal clock location • Anatomical location (e.g. perianal, ischioanal) • All collections should be reported, with size defined as[2]: - Small (3-10mm, not including tracts >3mm diameter) - Medium (11-20mm) - Large (>20mm) • Large collections should be notified to the referring team	• Height of collections
Measurements		• Tract length • Tract diameter
Other features	If present, comment on: • Fistula activity: Fibrotic, healed or scarred tract • Rectum and large bowel: presence of proctitis, presence of small & large bowel inflammation • Features of previous surgery: setons, drainage catheters, air foci, gas in fistula • Other pathologies: rectal wall thickening, involvement of pelvic organs, pelvic abscess with fistulous tracts, inflammation of adjacent tissues, retrorectal cysts, bone marrow oedema, osteomyelitis, anogenital fistulation, lymphadenopathy, malignant transformation of fistula, peritoneal pseudocysts, unilateral thickening of levator ani, tuberculosis, diverticulitis • Other perianal pathology: pilonidal sinus, hydradenitis suppurativa, haemorrhoids, fissure	

*Length of the anal canal is defined as the length of striated muscle inclusive of Puborectalis. The plane in which the canal is measured should be clearly stated. EAS= External Anal Sphincter, IAS = Internal anal sphincter, IS= intersphincteric

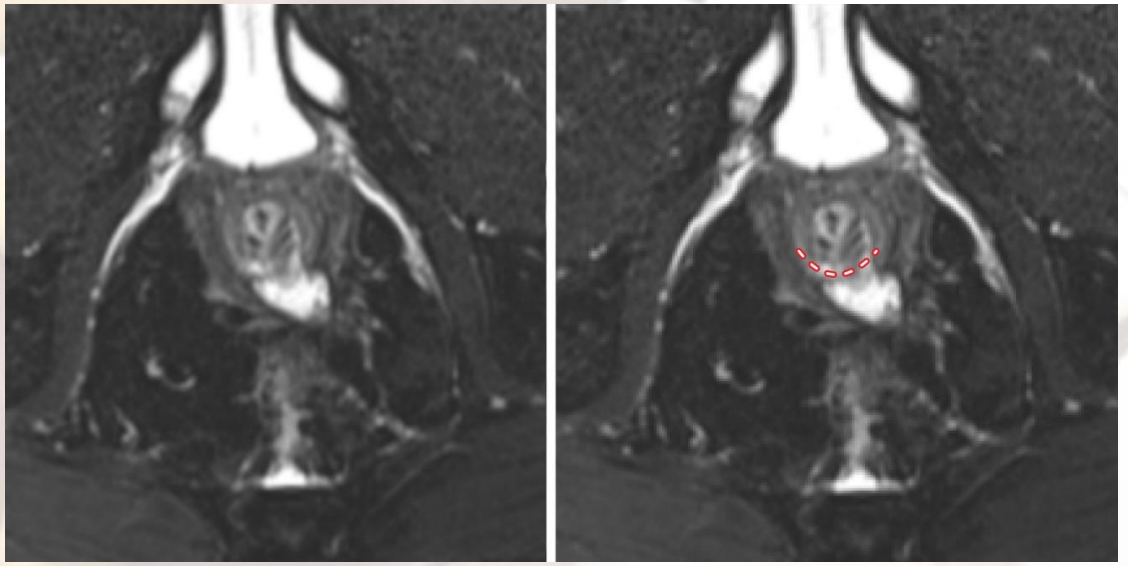
The final minimum dataset (1/3)

Feature	Always report	Report if remarkable or relevant to clinical scenario
Classification	• Parks classification subtype	
General characteristics	• Number of tracts • If tract is single, single-branched or multiple	
Internal opening	• Anal clock location • Height in upper/ middle/ lower thirds of anal canal* • If internal opening is anal or rectal • Number of internal openings	• Diameter *Remarkable when notably wide diameter* *Relevant in procedures requiring closure (next slide)*
Path of the fistula tract through the sphincters	• Location where tract crosses EAS or Puborectalis • Height that tract crosses EAS or Puborectalis in upper/ middle/ lower thirds of anal canal*	• General characteristics of IAS/ EAS *E.g. length, quality, deficits- remarkable if poor quality/ thinning* *Relevant when sphincter division is considered e.g. fistulotomy* • Course of IS fistula through IS space *Remarkable if primary tract is angulated/ horseshoeing* *Relevant if Video Assisted Anal Fistula Treatment (VAAFT) or Fistula Laser Closure (FiLaC) are considered- angulations may preclude procedure*

*Length of the anal canal is defined as the length of striated muscle inclusive of Puborectalis. The plane in which the canal is measured should be clearly stated. EAS= External Anal Sphincter, IAS = Internal anal sphincter, IS= intersphincteric

Example: Large internal opening

- Small internal opening allows tension-free repair in procedures where it requires closure:
  - Fistula Laser Closure (FiLaC)
  - Video Assisted Anal Fistula Treatment (VAAFT)
  - Advancement Flap- flap of (sub)mucosa mobilised to close internal opening
  - Over The Scope Clip (OTSC)



The final minimum dataset (2/3)

Feature	Always report	Report if remarkable or relevant to clinical scenario
Extensions	• Presence of extensions, even if absent • If extensions are single or multiple • Anatomical location • Location relative to Levator Ani (supra/ infralevator) • Location of point of communication to primary tract • Shape (e.g. horseshoe, blind tract)	• Description of course of extensions *Remarkable if angulated/ curving* *Relevant if being laid open (size of wound) or considering VAAFT (angulations)*
Collections	• Presence of collections, even if absent • Connection to the primary tract • Anal clock location • Anatomical location (e.g. perianal, ischioanal) • All collections should be reported, with size defined as[2]: - Small (3-10mm, not including tracts >3mm diameter) - Medium (11-20mm) - Large (>20mm) • Large collections should be notified to the referring team	• Height of collections *Remarkable if very high- may be best drained via the rectum* *Relevant in all procedures- adequate drainage enhances chances of success*

The final minimum dataset (3/3)

Feature	Always report	Report if remarkable or relevant to clinical scenario
Measurements		• Tract length *Remarkable if long (>4cm)* • Tract diameter *Remarkable if very wide/narrow* *Relevant when considering:* *VAAFT: diameter must allow cannulation by 3.7x4.4mm scope* *FiLaC: laser penetration may be less effective in wide tracts* *LIFT: diameter of the intersphincteric portion to be dissected and ligated* *Plug: determines plug size*
Other features	If present, comment on: • Fistula activity: Fibrotic, healed or scarred tract • Rectum and large bowel: presence of proctitis, presence of small & large bowel inflammation • Features of previous surgery: setons, drainage catheters, air foci, gas in fistula • Other pathologies: rectal wall thickening, involvement of pelvic organs, pelvic abscess with fistulous tracts, inflammation of adjacent tissues, retrorectal cysts, bone marrow oedema, osteomyelitis, anogenital fistulation, lymphadenopathy, malignant transformation of fistula, peritoneal pseudocysts, unilateral thickening of levator ani, tuberculosis, diverticulitis • Other perianal pathology: pilonidal sinus, hydradenitis suppurativa, haemorrhoids, fissure	

Surgical subset

- Features to be reported when a planned surgical intervention is indicated on request
- Inform selection of operative management strategy

Surgical subset
• Angulation through EAS/ IS space • Direction through EAS (cephalad/ caudad) • Angulation of branches • Distance between external opening and anal verge • Distance between extensions and primary tract • Height of extensions • Features of previous surgery: If present, comment on fat containing grafts, scarring

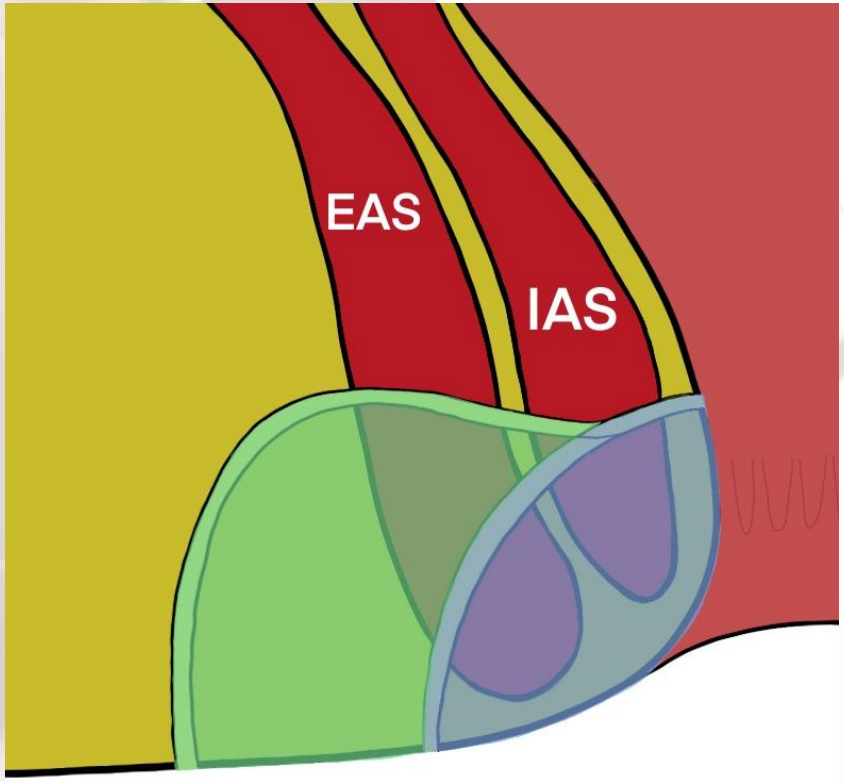
EAS= External Anal Sphincter, IAS = Internal anal sphincter, IS= intersphincteric

Example: Angulation through EAS/ IS space

- Cephalad angulation: tract runs higher than internal opening location suggests

- Greater proportion of sphincter divided than expected when performing fistulotomy

= ?continence risk



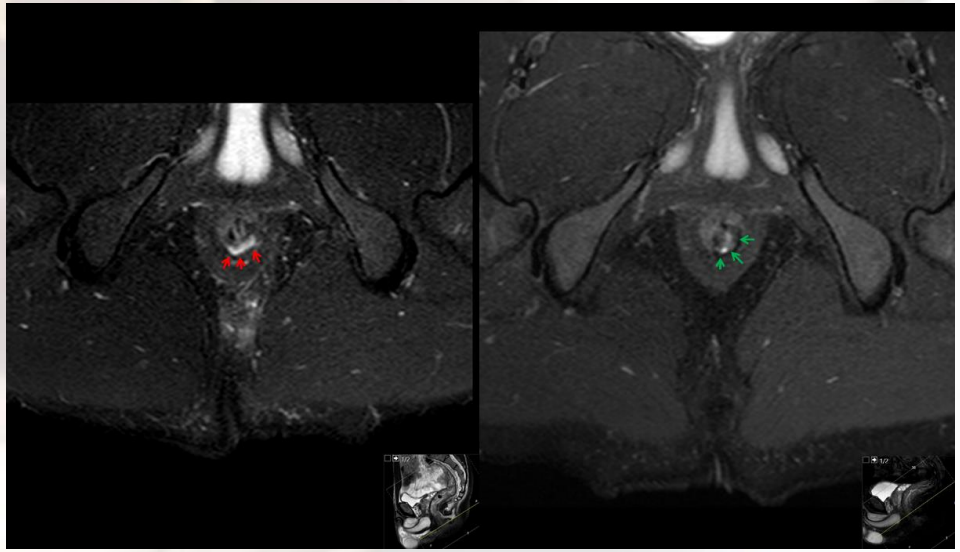
Reproduced from: Iqbal N, Tozer PJ, Fletcher J, Lightner AL, Sackitey C, Corr A, et al. Getting the most out of MRI in perianal fistula: update on surgical techniques and radiological features that define surgical options. Clin Radiol. 2021;76(10):784.e17-784.e25.

Perianal Crohn's Disease subset

- Features to be reported when Crohn's Disease is confirmed or suspected
- Important in assessing and monitoring disease activity
- Active tracts:
  - T2 hyperintensity
  - +/- T2 hypointensity of fistula wall
  - Surrounding tissue oedema (hyperintense)
- Inactive: hypointense on T1 & T2

Perianal Crohn's Disease subset

- Tract activity: active vs inactive tract



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Minimum dataset for the MRI request

- Features that guide radiologists visual search & enhance utility of the clinical report

Features that should be included in the MRI request
• History of Inflammatory Bowel Disease • Colorectal configuration (e.g. intact, Ileorectal anastomosis, Ileal Pouch Anal Anastomosis etc.) • Previous fistula surgery • Known fistula anatomy • Clinical findings & symptoms • Presence of seton • Specific clinical question Surgical subset: • State if a specific surgical procedure is planned/ being proposed

Conclusions and future work

- MRI minimum features to report:
  - For all fistulae- irrespective of aetiology, history, scope of practice
  - Additional subsets acknowledge additional value in pCD or surgical planning

- Next steps: demonstrate clinical utility