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RATIONAL IMAGING

Investigating perianal pain of uncertain cause

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This article explores the radiological investigations available to diagnose perianal pain of unknown cause, with particular reference to perianal sepsis

The patient

A 29 year old woman presented with constipation, constant perianal burning, and pain on defecation. Digital rectal examination was uncomfortable with induration in the right posterior quadrant, but there was no evidence of anal fissure or skin tag, thrombosed haemorrhoid, perianal haematoma, anal mass, or palpable abscess or fistula. Perianal skin sensation was normal.

What is the next investigation?

The aim of further investigation is to identify those causes of perianal pain not always detected by direct clinical examination. Commoner causes to consider

include occult perianal sepsis such as intersphincteric abscess (the prevalence of anal fistula in the general population is about 0.01%¹), anal complications of inflammatory bowel disease, and anal cancer. Rarer causes include retrorectal developmental cysts, sacrosplanal tumours, and sacral nerve tumours. Proctalgia fugax (intermittent severe anal or lower rectal pain of unknown aetiology) remains a diagnosis of exclusion.

Anal endosonography

Anal endosonography is a quick, safe, and cheap technique but requires operator experience. It provides detailed, high resolution images of the anal sphincter complex and intersphincteric space. Although its main clinical role is in investigating faecal incontinence, anal endosonography will usually reveal the presence of occult intersphincteric abscesses. It may also show anal tumours and developmental cysts, particularly if they communicate with the intersphincteric space, but data on its accuracy for these rarer conditions are limited.

Advantages and disadvantages of the use of anal endosonography and magnetic resonance imaging in the investigation of perianal pain of uncertain cause

Anal endosonography	Magnetic resonance imaging
No ionising radiation	No ionising radiation
High resolution images of anal sphincter complex	Good resolution of anal sphincter complex
Small field of view limits evaluation of tissues and disease processes extending beyond anal canal	Large field of view allows evaluation of tissues and disease processes extending beyond anal canal
Examination time around 5 minutes	Examination time around 20 minutes
No reported patient safety issues ³	Contraindicated in patients with certain metal implants; relatively contraindicated in first trimester of pregnancy ^{4,5} ; claustrophobia can prevent scanning
Operator dependent	Standardised scanning protocol
Requires specialised ultrasound equipment	Requires standard MRI scanner only
Requires insertion of endoanal probe	Can be performed without insertion of endoanal coil
All statements are supported by evidence, but references are supplied only for the less well established statements.	

This series provides an update on the best use of different imaging methods for common or important clinical presentations. The series advisers are Fergus Gleeson, consultant radiologist, Churchill Hospital, Oxford, and Kamini Patel, consultant radiologist, Homerton University Hospital, London.

In the case of perianal sepsis, an abscess is usually seen as a rounded, low echogenic defect between the internal and external anal sphincter, whereas the primary track of an established anal fistula is seen as a hypoechoic band (fig 1). In a non-randomised study of preoperative imaging in patients with suspected perianal sepsis, anal endosonography had 82% sensitivity for the correct classification of simple primary perianal fistulas.²

However the technique is limited by its relatively small field of view (just a few centimetres), such that

structures lateral to or above the anal sphincter complex are poorly visualised. For example, the presacral space, sacrum, and perirectal tissues are not reliably assessed, so sacrospinous tumours and pathological processes above the pelvic floor are not reliably excluded.

Magnetic resonance imaging (MRI)

MRI provides high contrast and high resolution images of soft tissue, allowing exquisite depiction of the anal canal structures and surrounding tissues. Although generally a safe technique, it is more time consuming than anal endosonography, is best avoided in early pregnancy, and is contraindicated in some patients with implanted metallic devices including cardiac pacemakers (table).^{4,5} Spatial resolution can be improved by placing a receiver endocoil in the anal canal itself,⁶ although in a comparative study of 30 patients an external MRI receiver coil placed over the pelvis was better tolerated than an endocoil and provided additional diagnostic information beyond the anal canal.⁷ MRI affords much greater anatomical coverage than anal endosonography and can show the perirectal tissues and sacrolumbar spine, thereby facilitating diagnosis of developmental cysts, sacrospinal tumours, and sacral nerve tumours.

In the case of suspected perianal sepsis, abscesses and fistulous tracks are seen as areas of bright high signal against the lower signal anatomical structures (fig 2). One major advantage of MRI over anal endosonography is its ability to delineate secondary extensions and abscesses arising from the primary fistulous track, which often course beyond the ultrasonic field of view. Such extensions, if unrecognised, are responsible for most cases of fistula recurrence after surgical treatment. In one study MRI detected 90% of primary tracks and was superior to anal endosonography in the detection of secondary abscesses remote from the primary fistula (85% *v* 75%).² In a non-randomised study of imaging in patients with recurrent anal fistula, use of preoperative MRI to guide surgery reduced future recurrence by 75% compared with standard surgery.⁸

Examination under anaesthetic

For patients who cannot tolerate digital rectal examination when awake, examination under anaesthetic is essential so that local causes of anal pain such as fissure or thrombosed haemorrhoids can be excluded. The procedure itself is well tolerated, but general anaesthesia carries a small risk. In patients with suspected perianal sepsis, examination may reveal the internal opening, secondary tracks, and abscesses, although in one study even experienced staff were able to identify only 61% of primary tracks, 78% of internal openings, and 33% of abscesses.² The combination of normal results from examination under anaesthetic and from MRI allows a diagnosis of proctalgia fugax to be made with greater certainty.

Fig 1 Results of anal endosonography. Top: image of the distal anal canal, showing an intersphincteric abscess (long arrow) as a local, low echogenic focus between the internal sphincter (short arrow) and external sphincter (arrowhead). Bottom: image distal to terminal fibres of the internal anal sphincter shows a low echogenic track (arrow) medial to the distal fibres of the external anal sphincter (arrowhead) in keeping with an intersphincteric fistula

Outcome

Given the patient's relatively acute history and the findings from digital rectal examination, occult perianal sepsis was suspected. Anal endosonography, being quick and readily available, was performed on the same day as the outpatient assessment and confirmed a small intersphincteric abscess, probably associated with an intersphincteric fistula (fig 1).

Further imaging would not usually be indicated for a simple perianal abscess or fistula before surgical treatment, but there was clinical concern that the palpable induration in the anal canal could indicate

Fig 2 Results of axial magnetic resonance imaging. Top: section through the distal anal canal shows the internal opening of the fistula (long arrow) as a high signal focus at the 7 o'clock position; there is no evidence of sepsis beyond the external sphincter (arrowhead) in the ischio-anal fossa (short arrow). Bottom: section distal to the anal sphincters shows the fistulous track (arrow) as high signal and forming a small abscess

LEARNING POINTS

Imaging plays an important role in elucidating the cause of anal pain when the diagnosis is not clinically apparent

Endoanal ultrasound is an increasingly available, relatively inexpensive, quick and safe technique providing high resolution images of the anal sphincter complex, and intersphincteric space, but it is limited by a relatively small field of view

Magnetic resonance imaging, although not universally available, affords much greater anatomical coverage than endoanal ultrasound and can also image the perirectal tissues and lumbar-sacral spine, facilitating diagnosis of conditions beyond the anal canal

In the case of perianal sepsis, preoperative magnetic resonance imaging may be indicated in clinically suspected complex or recurrent disease to guide surgery, reducing the risk of future recurrence

extension of sepsis beyond the primary abscess. Given the known risk of fistula recurrence caused by undiagnosed (and thus untreated) extensions, MRI was performed. This confirmed an intersphincteric fistula complicated by a small intersphincteric abscess, but excluded any secondary tracks or extensions (fig 2). The patient then underwent examination under anaesthetic with definitive laying open of fistula and is now symptom-free.

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