

Research Article

Role of magnetic resonance imaging in evaluation of perianal fistulas

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ABSTRACT

Background: Perianal fistula is a common disorder that often recurs because of infection that was missed at surgery. Preoperative MR imaging can help to prevent recurrence. The purpose of the study was, in this article we study the various types of perianal fistulas with MR imaging and study the usefulness of MR imaging in delineating the primary tract and complications of perianal fistula.

Methods: We studied MRI images of 35 patients with different types of perianal fistulas. MR imaging were performed on 1.5-T magnet MR system (Siemens magneto Essenza). Imaging was performed with multiplanar T1-weighted, T2-weighted and PDFS sequences.

Results: Total 35 patients were studied, out of which 18 (51%) patients showed grade 1 (simple linear intersphincteric fistula), 5 (14%) showed grade 2 (intersphincteric with abscess or secondary tract), 6 (21%) showed grade 3 (transsphincteric), 5 showed grade 4 (14%) (transsphincteric with abscess or secondary tract in ischioanal fossa) and none (0%) showed grade 5 (supralevator and translevator).

Conclusions: MR imaging provides precise location of the fistulous track, and its relationship to pelvic floor and the sphincter complex and helps in the identification of secondary tracks and abscesses.

Keywords: MRI, Perianal fistula, Intersphincteric, Transsphincteric

INTRODUCTION

Perianal fistula is an inflammatory condition that affects the region around the anal canal, causing significant morbidity and often requiring repeated surgical treatments due to its high tendency to recur. It predominantly affects young males, with a male-to-female ratio of 2:1. The most common presenting symptom is discharge (65% of cases), but local pain due to inflammation is also common.¹ MRI is an accurate diagnostic tool for the detection of fistula in ano.² Until recently, imaging had a limited role in the preoperative assessment of perianal fistulas. Magnetic resonance (MR) imaging has been shown to demonstrate accurately the perianal anatomy.³ MR imaging allows identification of infected tracks and abscesses that would otherwise remain undetected. Furthermore, radiologists can provide

detailed anatomic descriptions of the relationship between the fistula and the anal sphincter complex, thereby allowing surgeons to choose the best surgical treatment, significantly reducing recurrence of the disease or possible secondary effects of surgery, such as fecal incontinence.^{4,5}

Aims and objectives

1. To study the usefulness MR imaging in perianal fistula.
2. To study the various grades and types of perianal fistulas with MR imaging.
3. To study complications of perianal fistulas with MR imaging.

METHODS

We studied 35 patients presented in Department of Radio diagnosis at Dr. Vasantrao Pawar Medical College, Hospital and Research Centre, Nashik.

Methodology

Patients referred for MR imaging of perianal fistula in the Department of Radio diagnosis at Dr. Vasantrao Pawar Medical College, Hospital and Research Centre, Nashik were included in this study. We studied MRI images of 35 patients with different types of perianal fistulas. MR imaging were performed on 1.5-T magnet MR system (Siemens magneto Essenza). Imaging was performed with multiplanar T1-weighted, T2-weighted and PDFS sequences.

RESULTS

Total 35 patients referred for MR imaging of perianal fistula were studied, patient age ranged from 20- 60 years. Out of the 35 patients included in the study group, 3 were females (m: f = 12:1). 18 (51%) patients showed grade 1 (simple linear intersphincteric fistula), 5 (14%) showed grade 2 (intersphincteric with abscess or secondary tract), 6 (21%) showed grade 3 (transsphincteric), 5 showed grade 4 (14%) (transsphincteric with abscess or secondary tract in ischioanal or ischioanal fossa) and 0 (0%) showed grade 5 (supralelevator and translevator).

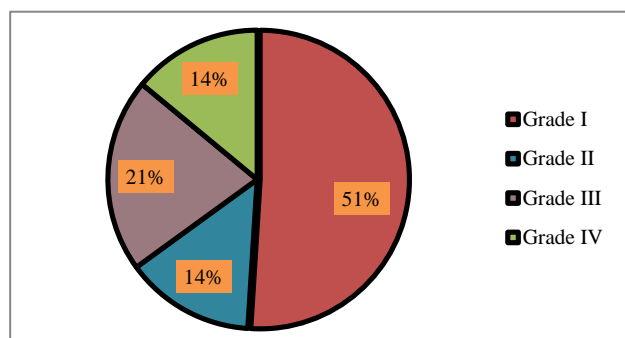


Figure 1: MR imaging of perianal fistula.

DISCUSSION

MR imaging has emerged as the technique of choice for preoperative evaluation of perianal fistulas to improve patient outcome. The importance of MR imaging in this context lies in its ability to demonstrate hidden areas of sepsis and secondary extensions, both of which contribute to the high rate of recurrence after surgery.⁶

Furthermore, MR imaging can be used to define the anatomic relationships of the fistula to predict the likelihood of postoperative fecal incontinence.⁷

There are two main classification systems for perianal fistulas: the Parks classification and the St James's University Hospital classification.

Fistulas were classified into four groups: intersphincteric, transsphincteric, suprasphincteric, and extrasphincteric. In the Parks classification, the external sphincter is used as the keystone.⁸

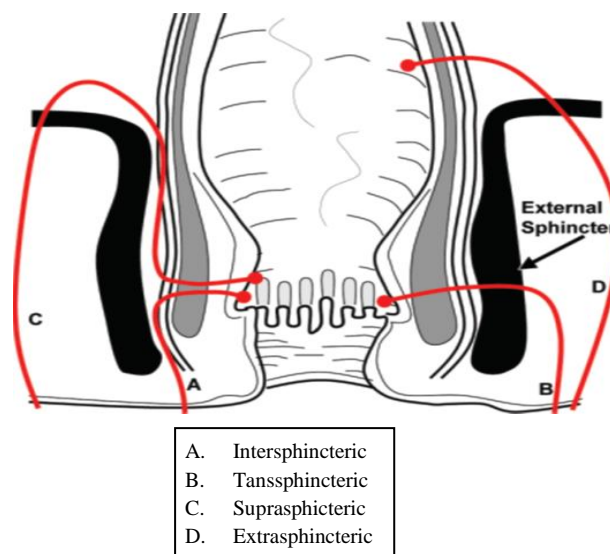


Figure 2: Diagrammatic representation of types of fistula.

St James's university hospital classification

The classification grades fistulas into five groups:

Grade 1: Simple linear intersphincteric fistula;
 Grade 2: Intersphincteric with abscess or secondary tract;
 Grade 3: Transsphincteric;
 Grade 4: Transsphincteric with abscess or secondary tract in ischioanal or ischioanal fossa;
 Grade 5: Supralelevator and translevator.⁹

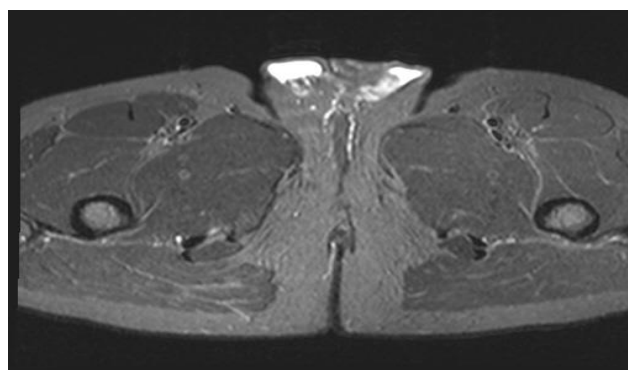


Figure 3: PDFS axial image showing intersphincteric fistula.

Conventional fistulography has two major drawbacks: (a) the difficulty of assessing secondary extensions owing to lack of proper filling with contrast material and (b)

inability to visualize the anal sphincters and hence determines their relationship to the fistula.¹⁰

Computed tomography (CT) with rectal and intravenous contrast material can be used to analyze anal fistulas, particularly those in the rectal area. While useful for evaluation of perirectal inflammatory disease and suspected perirectal abscesses, CT usually fails to define subtle fistulas and abscesses owing to poor resolution of soft tissue.^{11,12}

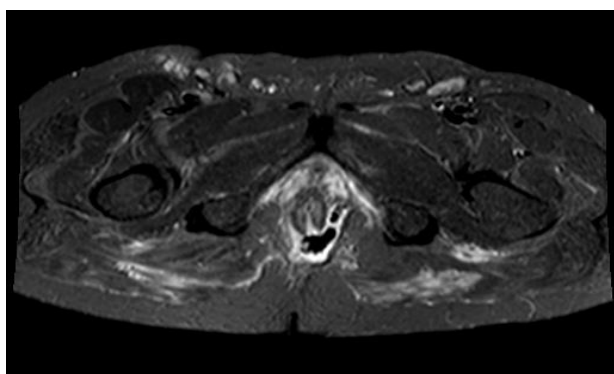


Figure 4: PDFS axial sequence showing a trans-sphincteric fistula.

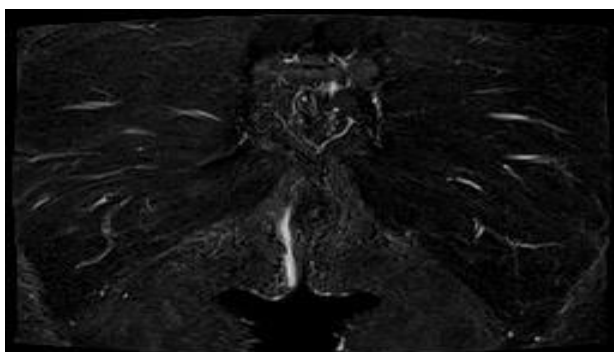


Figure 5: PDFS coronal image showing a trans-sphincteric fistula.

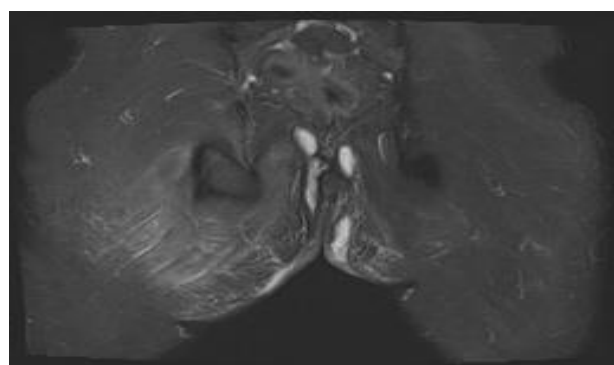


Figure 6: PDFS coronal image showing a transsphincteric fistula with multiple secondary tracks.

Anal endosonography was the initial imaging technique used to visualize the anatomy of the anal canal and anal

sphincters in detail.¹³ This technique provides adequate imaging of the rectal wall and anal sphincter and of intersphincteric fistulas and their relationship to the anal sphincters.^{14,15} However, the limited field of view is a considerable inconvenience with this approach, precluding use of endosonography to assess primary superficial, suprasphincteric, and extrasphincteric tracks or secondary extensions.¹⁶

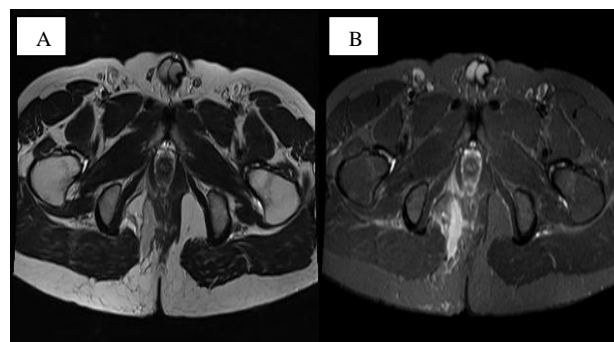


Figure 7: A - T2 axial and B - PDFS axial images showing a trans-sphincteric fistula with abscess in the right ischioanal fossa.

The advantages of MR imaging include multiplanar imaging and a high degree of soft-tissue differentiation, which show the fistulous track in relation to the underlying anatomy in a projection relevant to surgical exploration.¹⁷

Fat-suppressed T2-weighted sequences such as short inversion time inversion-recovery (STIR) or frequency-selective fat-saturated T2-weighted FSE may be used to increase the conspicuity of fluid-containing tracks or abscesses.¹⁸ MR imaging is the optimal technique to distinguish complex from simple perianal fistulas.¹⁹

Characteristic MR imaging findings are obtained for perianal fistulas and abscesses with the different sequences of the protocol. T1-weighted images give an excellent anatomic overview of the sphincter complex, levator plate, and ischioanal fossa. Fistulous tracks, inflammation, and abscesses appear as areas of low to intermediate signal intensity on T1 weighted imaging. T2-weighted images provide good contrast between the high signal intensity fluid in the track and the low signal fibrous wall of the fistula and allow adequate differentiation of the boundaries of the internal and external anal sphincters.

Active fistulous tracks and extensions have high signal intensity on T2-weighted images, while the sphincters have low signal intensity. Chronic fistulous tracks or scars appear hypointense on both T1- and T2-weighted images. Abscesses appear hyperintense on T2-weighted images due to the presence of pus and fluid in the centre.²⁰

CONCLUSIONS

MR imaging of perianal fistula relies on the inherent high soft tissue contrast resolution and the multiplanar display of anatomy by this modality. MRI is a non invasive imaging of perianal fistula helping in the adequate grading of the fistula for effective treatment. MR imaging provides precise location of the fistulous track, and its relationship to pelvic floor and the sphincter complex and helps in the identification of secondary tracks and abscesses.

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