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PERIANAL FISTULA EVALUATION BY MRI

Radiology

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ABSTRACT

Background: Perianal fistula is a common disease which frequently requires surgical intervention for complete cure. Demonstration of track characteristics like ramifications, blind endings and abscess formation are essential for surgical planning. **Aims And Objectives:** Our objective for this study is conforming clinical diagnosis and characterisation of perianal fistula by MRI, to detect and grade perianal fistulas according to various classifications. **Materials And Methods:** It is an observational study, done on patients presenting with perianal fistulas over a 12 months duration. MR was done for fistulous tracks and gradation according to St. James's University Hospital MR Imaging Classification of Perianal Fistulae." **Results:** MRI was done for Total 50 clinically diagnosed patients of perianal fistula. Approx. 36 % had external opening at 7'o clock position and approx. 32 % had external opening at 5'o clock position. 52 % show internal opening at 6 O'clock position and 12 % had internal opening at 3' O clock position. **Conclusion:** MRI of perianal fistula is simple and non-invasive procedure, which can detect, characterise and classify perianal fistula and has definitive role in preoperative planning of perianal fistula and successful treatment of the disease.

KEYWORDS

Perianal Fistula; Mr Fistulogram; St. James's University Hospital Classification.

INTRODUCTION

Infections of the anal glands, communicating with the anal crypts are known as anorectal abscesses. Inflammation of anal glands in intersphincteric plane leads to the formation of local abscesses, which on acute phase causes an anorectal abscess , and on chronic stage forms peri anal fistula.[1] As the disease progresses abscesses enlarges in size and spread in different directions. When it penetrates the external sphincter and extends into the ischiorectal fat and forms ischiorectal abscess and after rupture forms opening at skin. When it extends upwards between the internal sphincter and external anal sphincter, it forms a supralevator abscess.[2]

proper preoperative planning is must Due to its high recurrence rate , significant morbidity and , Other causes of like tuberculosis, crohn's disease, trauma, radiation therapy, malignancy, pelvic infection, or foreign body (sutures), or thrombosed haemorrhoids.

Due to its greater soft tissue contrast , MRI is far more superior and gives accurate anatomical details and the relationships of the fistula with different sphincters and pelvic floor muscles, information regarding primary track and its ramifications and abscess formation.

Goodsall's rule to guide the location of the internal opening of fistula is only appropriate in about two thirds of patients.[3] according to it, "anus," as visualized in patients in the lithotomy position, imaging findings is related to the anal clock position. Anterior perineum is at 12 o' clock, natal cleft is at 6'o clock, left lateral aspect of anal canal at 3 'o clock and right lateral aspect of anal canal at 9 'o clock position.

Fistulogram is painful and can lead to complications. Perianal USG is also painful and artefacts due to air can lead to suboptimal evaluation. CT is limited in its soft tissue contrast.

MRI Anatomy

On MRI axial images the external anal sphincter has low signal intensity on both T2-weighted and fat-suppressed T2-weighted sequences, and is surrounded laterally by the bright signal of fat in the ischioanal fossa. The coronal plane offers a clear view of the levator ani muscle, for fistula location, above or below the levator plate, as high or low level . The puborectalis muscle, which contributes to the puborectalis sling, is identified as a thickened portion of the upper external sphincter fibers. This muscle continues superiorly to blend with the **levator ani**, forming part of the supportive structure of the pelvic floor.[4]

Classification of Perianal Fistulas (5)

In Parks' Classification Perianal fistulae are categorized based on the anatomical route taken by the primary fistulous tract in relation to the anal sphincter complex as below :

Intersphincteric Fistula (60–70%) These fistulae are confined to the intersphincteric space-located between the internal and external sphincters

Transsphincteric Fistula (20–30%) These fistulae begin in the intersphincteric space but extend through the external anal sphincter into the ischioanal fossa, eventually reaching the perianal skin.

Suprasphincteric Fistula (Uncommon) The fistulous tract ascends within the intersphincteric space above the levator ani before descending through the ischioanal fossa to reach the skin surface.

Extrasphincteric Fistula (Rare) These tracts bypass the sphincter complex entirely and typically arise from an underlying pelvic pathologies such. The tract extends inferiorly through the levator ani to reach the perianal region.

St. James's University Hospital Classification

This MRI-based system classifies perianal fistulae by analysing the relationship of the tract to the internal and external sphincters, along with any associated abscesses or extensions, particularly supralevator or trans levator involvement. It provides a more detailed assessment than Parks' system.

On MRI we assessed, perianal fistulae with the following key parameters like :

Location of the internal opening. high- or low-lying fistulae by their position relative to the levator ani. Extent of the tract (transsphincteric, extra sphincteric, or with supralevator extension) , secondary branches, ramifications, or early fistula formation , Associated ischioanal/ ischiorectal / horseshoe-shaped abscesses Nature of the tract-actively inflamed or chronic / fibrotic path.

MATERIALS AND METHODS

A prospective observational study was carried out over a 24-month period.

A total of 50 patients underwent MRI of the perianal region.

Inclusion Criteria

Patients with a clinical diagnosis of perianal fistula.
Individuals with a history of surgical intervention for perianal fistula who presented with recurrent symptoms.

Exclusion Criteria

Patients with absolute contraindications to MRI, such as those with metallic implants.
Individuals with claustrophobia.

MRI Technique

All examinations were conducted using a 1.5 Tesla MRI scanner with Patient's in prone position, and a phased-array body surface coil was used without any prior bowel preparation. Axial and coronal T2-weighted , proton density (PD) sequences using a small field of view (FOV) were obtained, optimized for detailed pelvic imaging. Gadolinium contrast-enhanced sequences were also performed in few cases.

RESULTS

Among the50 patients evaluated, the largest proportion (60 %) belonged to the 41–50 year age group, followed by 32 % in the 51–60 year group [Table 1].

Table 1. Age And Sex Distribution Of Patients

Age group In years	Male	Female	Total number of cases	Percentage of cases
0-30	0	0	0	0
31-40	2	0	2	4
41-50	28	2	30	60
51-60	15	1	16	32
61-70	2	0	2	4

A significant male predominance was observed [Table 1].

Previous surgical intervention for perianal fistula was documented in 4 patients (4 %).

MRI findings confirmed the presence of perianal fistula in all 50 clinically diagnosed cases, supporting the accuracy of clinical suspicion.

External Opening

The most frequent site for the **external opening** was the **7 o'clock position**, observed in **18 patients (36 %)**, followed by the **5 o'clock position** in **16 patients (32)** [Table 2].

Internal Opening

In terms of **internal openings**, the **6 o'clock position** was most commonly involved, seen in **26 patients (52 %)**, followed by the **3 o'clock position** in **6 patients (12 %)** [Table2].

Table 2. Distribution of cases according to anal o' clock

External opening	Number of patients (%)
1	1 (2 %)
2	0
3	2(4 %)
4	4(8 %)
5	16 (32 %)
6	7 (14 %)
7	18 (36 %)
8	0
9	0
10	0
11	1 (2 %)
12	1 (2 %)
Total	50 (100 %)
Internal opening	**Number of patients (%)**
1	4(8 %)
2	0
3	6(12 %)
4	2(4%)
5	4(8 %)
6	26 (52%)
7	4 (8 %)
8	0
9	2(4 %)
10	0
11	2(4 %)
12	0
Total	50 (100 %)

Fistula Morphology

Horseshoe-shaped tracts were detected in **2 patient (4%)**. **Secondary tracts** branching from the primary tract were present in **8 patients**. **Intersphincteric abscess or fluid collections** were noted in **10 patients (20%)**, commonly seen along the course of the fistulous tract.

Ischioanal or ischiorectal abscesses were observed in **20 patients (40%)**, indicating more extensive disease in these cases.

Complex Fistulae

MRI revealed **complex fistulous tracts** in **20 out of 50 patients**. Among these, **2 cases** were categorized as **high perianal fistulae**, based on their location above the levator ani muscle

Table 3. Distribution Of Cases According To Mr Park's Classification

MR park's classification	Number of cases (%)
Intersphincteric	32 (64 %)
Transsphincteric	12 (24 %)
Intersphincteric +transsphincteric	0
Suprasphincteric	6 (12 %)
Extrasphincteric	0
Total	50 (100 %)

Table 4. Distribution Of Cases According To MR Park's Classification

MR st. james classification	Number of cases (%)
1	21 (42 %)
2	9 (18 %)
3	9 (18%)
4	10 (20 %)
5	0
Total	50 (100 %)

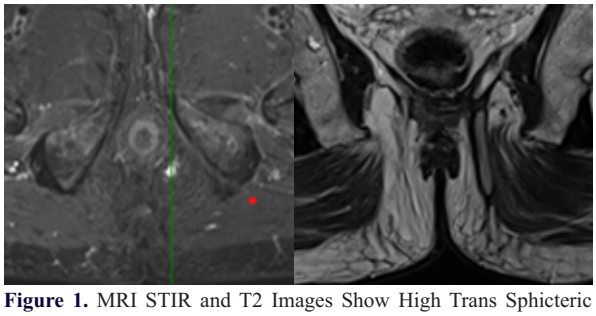

Figure 1. MRI STIR and T2 Images Show High Trans Sphicteric Fistula.

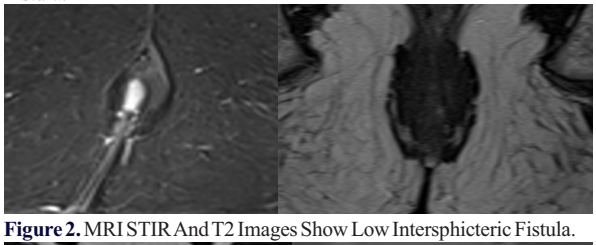

Figure 2. MRI STIR And T2 Images Show Low Intersphicteric Fistula.

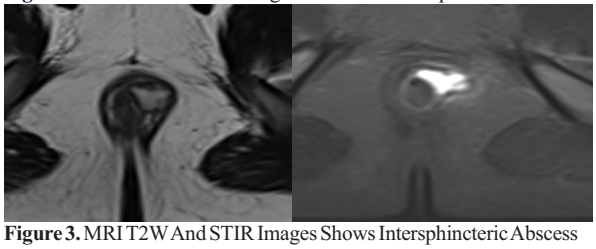

Figure 3. MRI T2W And STIR Images Shows Intersphincteric Abscess

DISCUSSION

Our study demonstrated a male predominance and most affected age group being 41–50 years for both sexes. Frequent external openings in the para median positions (the 7 and 5 o'clock positions), while internal openings were more commonly located midline at the 6 o'clock position.

According to MR-based Parks classification, intersphincteric fistulae were the most common, followed by transsphincteric types. The findings are in line with Mallouhi et al. (2004)(7) study, supporting the age distribution observed in our study.

All 50 patients included in our study showed positive MRI findings for fistula-in-ano. This supports MRI's reliability in detecting the condition. In contrast, study by Pushpinder Singh Khera (6) highlights MRI's role in distinguishing fistulae from other perianal pathologies. MRI is particularly valuable in identifying secondary tracts, may course through intersphincteric, ischioanal, or even supralevator regions. In our study, 20out of 50patients (40%) presented with complex fistulae, defined by multiple internal/external openings, secondary extensions, and/or associated abscesses , in line with the study done by Pushpinder Singh Khera(6).

MRI is particularly useful in identifying hidden or occult intersphincteric infections and horse shoe abscesses. Importantly, MRI findings can predict the likelihood of repeat surgery, making it an essential part of preoperative counseling in patients undergoing treatment for anorectal sepsis or fistula. The St. James's University MRI grading system has shown excellent correlation with surgical findings and helps identify cases that may require revision procedures.

Limitations

Contrast-enhanced MRI was not performed in all cases due to financial constraints. However, in the majority of cases, post-contrast imaging did not significantly alter the diagnosis or management. The sample size was relatively small, yet the findings remained consistent with those of larger, previously published studies.

CONCLUSION

MRI is a highly reliable, non-invasive, and essential imaging modality for the comprehensive assessment of perianal fistulae. Its multi planar capabilities allow for detailed visualization of fistula and its complications, which is crucial for accurate diagnosis and surgical planning.

Given its accuracy, reproducibility, and ability to significantly influence treatment decisions, MRI should be considered a standard component in the preoperative evaluation of patients with fistula-in-ano, particularly those with recurrent or complex disease.

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