



“ROLE OF MAGNETIC RESONANCE FISTULOGRAM IN ASSESSMENT OF PERIANAL FISTULAS”

Radio-Diagnosis

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ABSTRACT

Aims and Objectives: The aim of this study is to evaluate the role of Magnetic resonance Fistulogram in assessment of perianal fistulas .

Materials and Methods: This was a hospital based retrospective study done in 50 patients who were clinically diagnosed to have perianal fistula and send for MR fistulogram to radiology department from September 2019 to June 2021. The patients were subjected to MR fistulogram using 1.5- Tesla unit system. The following were assessed: type of fistula, position of internal opening, grading of fistula by St. James's University Hospital MRI Classification

Results: The most prevalent type of fistula was transphincteric type followed by intersphincteric type. According to St. James's University Hospital Classification, Grade IV fistulas were the commonest followed by grade II fistulas.

Conclusion: Perianal fistulas are associated with numerous complications like secondary tracks and abscess formation . Complete evaluation of these complications is required to prevent residual and recurrent disease. Also, to prevent injury to external sphincter and resultant fecal incontinence, it is necessary to establish the relationship of sphincter with the fistulous tracks. MRI satisfies all these requirements of surgeons and helps in surgery planning.

KEYWORDS

perianal fistula, fistulogram.

INTRODUCTION:

Fistula is a term used to describe an abnormal communication between two structures or organs, or between an organ and the body's surface. Perianal fistulas affect 0.01 percent of the population, with young men being the most affected. Identification and therapy of perianal fistulas require a thorough understanding of anorectal anatomy. The Park's and St James University Hospital classification systems are used, with the latter providing more information about perianal fistulas.

MATERIALS AND METHODS:

This was a hospital based retrospective study conducted from September 2019 to June 2021. 50 patients, who were diagnosed to have perianal fistula clinically and referred for MR fistulogram to the Department of Radiology ,PESIMSR, kuppam were included in the study. Any contraindications for performing MRI excluded from the study.

Patients were subjected to MR fistulogram using 1.5-Tesla unit system. The following were assessed: type of fistula, position of internal opening, grading of fistula by St. James's University Hospital MRI Classification.

Techniques:

The anal canal is tilted forward from the vertical by approximately 45 degree in the sagittal plane . Thus, the routine axial and coronal images are insufficient. It is necessary to obtain oblique axial and coronal images which are oriented orthogonal and parallel to the anal canal respectively.

All MRI studies were carried out on a 1.5-T MRI system (GE 1.5T) using an 8-channel phased-array coil. The sequences evaluated were: Axial T1 TSE , Axial fat-suppressed T2W, Axial post-contrast T1W [post injection of 10 ml of gadodiamide, Coronal T1W TSE, Coronal T2W fat-suppressed and coronal post-contrast T1W.

RESULTS

Of the total 50 patients 39 were males(78%) and 11 were females(22%). The most common age group involved is 21-30 years (34%)(Table 1). The most prevalent type of fistula was transphincteric type(48%) followed by intersphincteric type (46%). Supralelevator extension was seen in 3 patients (6%). In our study, 32(64%) patients had secondary tracts. Abscesses were identified in 24 (48%) patients. Grade IV fistulas were the commonest which was found in 22 patients

(44%) followed by grade II fistulas which was found in 13 patients (26%).

Most common position of internal opening is 6-8'oclock position. Most common external opening on right side perianal region . Out of 50 patients two patients are associated with osteomyelitis of sacral bone .

Table 1 showing Age distribution of perianal fistulas.

Age	Number	Percentage
20	1	0.50%
21-30	17	34%
31-40	14	28%
41-50	8	16%
51-60	1	0.50%
61-70	1	0.50%
71-80	1	0.50%

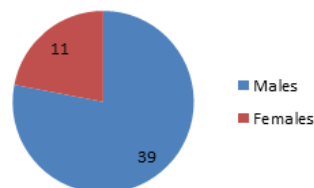


Figure 1 showing sex distribution.

Table 2. Showing type of sphincter involvement.

Type of sphincter involved	Number	Percentage
Transphincteric	24	48%
Intersphincteric	23	46%
Supralelevator extension	3	6 %

Table 2 showing distribution of different types fistulas according to St jame's classification .

St jame' Type	Number	Percentage
I	10	20
II	13	26
III	2	4
IV	22	44
V	3	6

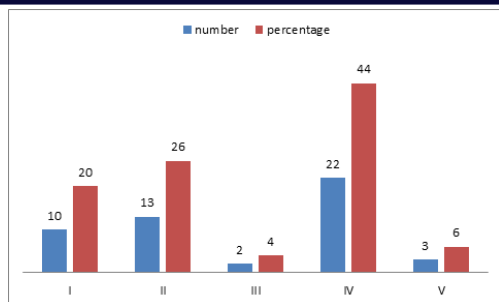


Figure 2 showing distribution of fistulas according to St jame's classification

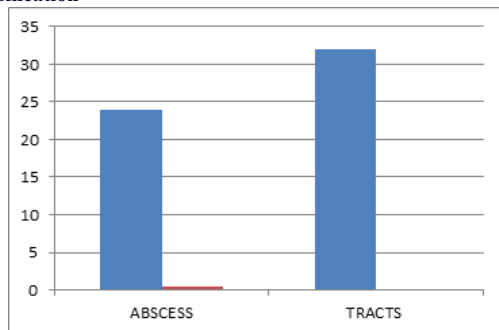


Figure 3 shows distribution of abscesses and secondary tracts in our study .

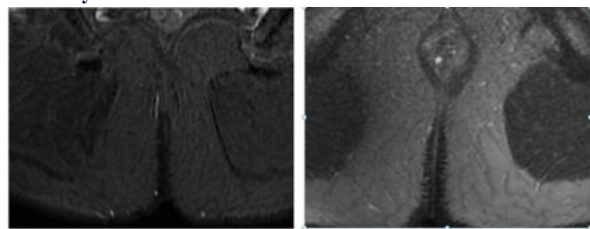


Figure4 shows right intersphincteric type of perianal fistula (St james type I) with internal opening at 7'o clock position .

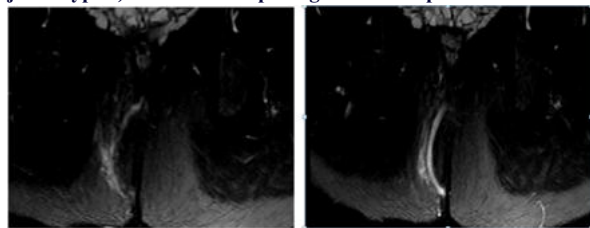


Figure5. T2WI coronal images showing right perianal transsphincteric fistula (St jame's type III)

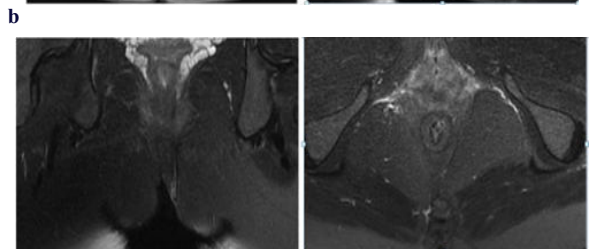
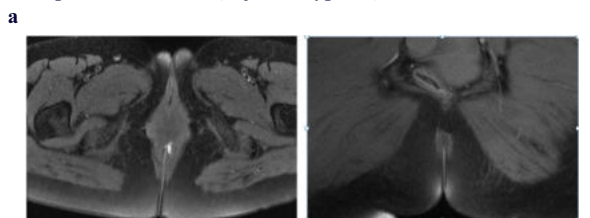


Figure 6a . Post contrast T1WI images better delineating the left intersphincteric perianal fistula. Enhancing fistulous tract with internal opening at 12'o clock position. 6b. Coronal and axial T2FS

images showing Type II St jame's perianal fistula with small abscess .

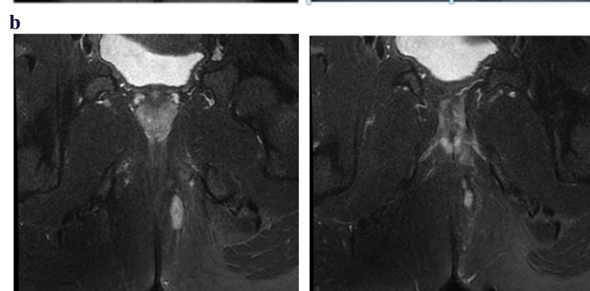
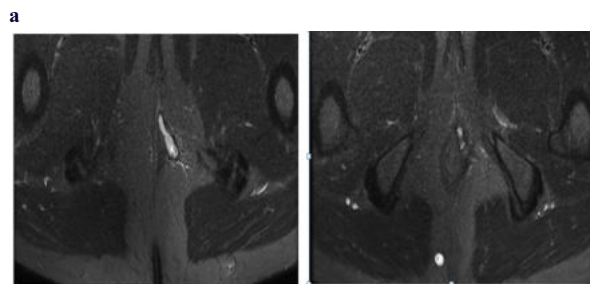


Figure .7a – STIR axial images showing left perianal transsphincteric fistula (Type IV St james classification) .7b. Coronal images of the same patient with abscess.

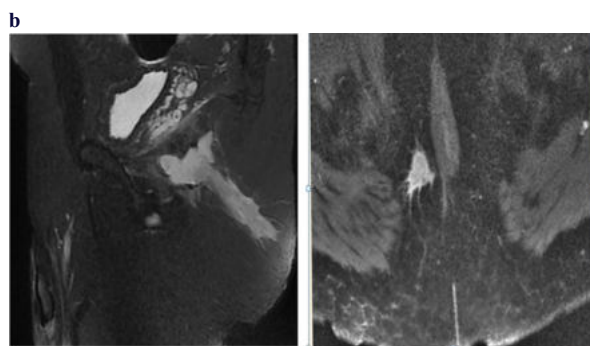
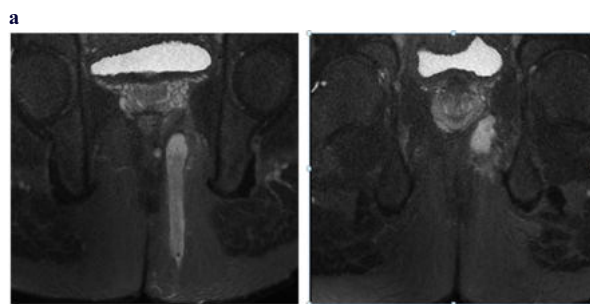


Figure8 .Left perianal transsphincteric fistula with large fistulous tract showing supralelevator extension (St jame's type V) .On contrast there is significant enhancement of the fistulous tract .

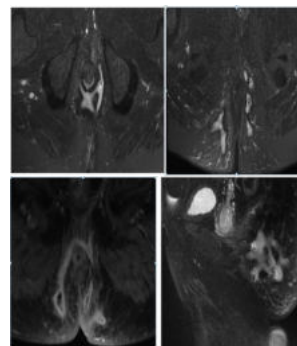


Figure 9 Complex perianal fistula with horseshoe abscess and bilateral perianal region involvement .

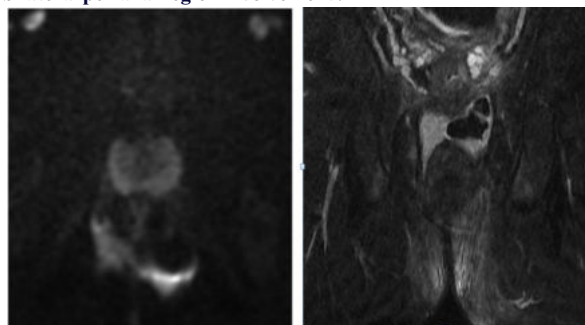


Figure 5 . Horseshoe abscess showing diffusion restriction on DWI.

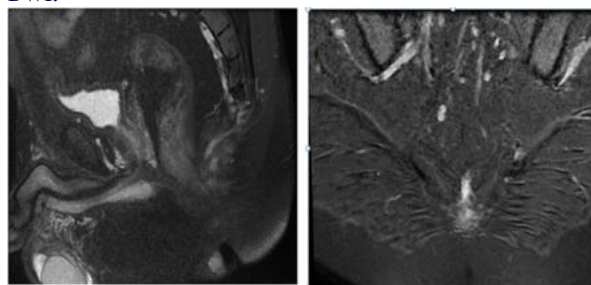


Figure10 .Fistula with secondary tracts extending up to coccyx with abscess formation and osteomyelitis.

DISCUSSION

MRI imaging of perianal fistulae depends on high soft tissue contrast resolution and the multiplanar display of anatomy by this modality. In one of the early studies on MRI fistulography, Lunniss *et al.* reported a concordance rate of 86-88% between MRI and surgical findings.[1]

Subsequent studies have suggested that MRI is more sensitive than even surgical exploration of the tract.[2,3] MRI is especially useful in patients with fistulae associated with Crohn's disease and those with recurrent fistulae,[3] as these entities are associated with branching fistulous tracts. Missed extensions are the commonest cause of recurrence.[4]

MR imaging of perianal fistulas :

The main aim towards which the treatment is directed is eradication of infection while preserving the anal continence. In order to achieve this, the surgeon needs to know the relationship of the tract to anal sphincter muscles and proper delineation of secondary tracts in order to prevent recurrence. When the efficacy of endoanal ultrasonography was compared with digital rectal examination and MR imaging in 108 primary fistulous tracts, the proportion of fistulous tracts correctly identified with each modality was 61% with digital rectal examination, 81% with endoanal ultrasonography and 91% with MR imaging. [5] In addition, endoanal ultrasonography aided in correct identification of internal opening in 91% of patients when compared with 97% in patients who underwent MR imaging. So, MRI is the superior imaging technique in all aspects and endoanal ultrasonography is an alternative for identification of internal opening. Lunniss *et al* reported concordance rate of 86-88% between MRI and surgical findings [6]. Buchanan *et al* showed that surgery guided by MRI reduced further recurrence by 75% in patients with recurrent anal fistula [5].

Normal MRI anatomy:

On T1W, T2W, and fat suppressed T2W images, the external anal sphincter (striated muscle) appears as a hypointense structure. On T1W and T2W TSE images, the internal anal sphincter (smooth muscle) is hypointense, but on fat-suppressed T2W images, it is moderately hyperintense. In a post-contrast study, it enhance. Levatorani is well visible in the coronal pictures. The puborectalis ring is identified by thickening of the external sphincter's superior fibres. The puborectalis muscles join with the levator muscles in the upper abdomen.

Pathological Appearances in Perianal Fistula:

T1 weighted images of the sphincter complex, levator plate, and ischiorectal fossa provide an outstanding anatomic perspective. The

hyperintense fluid in the track and the hypointense fibrous wall of the fistula are well contrasted in T2 weighted images. [7] Fistulous tracts, abscess cavities, and active granulation tissue show strong enhancement on gadolinium enhanced fat suppressed T1 weighted images, but fluid in the track remains hypointense. Except for the internal anal sphincter and blood in arteries, normal anorectal features do not improve with contrast administration. Fibrotic tracts emerge as linear structures that are hypointense on both T1 and T2 weighted imaging and are not enhanced by chronic fistula or scarring. Because of the extended T1 and T2 relaxation durations, STIR sequences provide good fat suppression and allow for a greater appreciation of inflammatory alterations. STIR pictures can be misread at times. They don't always succeed in demonstrating their worth.

Classification of perianal fistulas :

Parks *et al* [7] described perianal fistulas in coronal plane according to its relationship with sphincters and course of fistula. Depending on location and course of the primary tract, perianal fistulae have been classified into 4 types.

- Intersphincteric (incidence-60-70%)
- Transsphincteric fistula (incidence 20-30%)
- Suprasphincteric (Uncommon)
- Extrasphincteric (Uncommon)

MR imaging based classification is St James University Hospital Classification, which has 5 grades. It is easy to use as they are based on anatomical landmarks. This classification also considers both primary and secondary fistulous tracts and abscesses in classifying the types of fistulas.

Grade 1: Simple linear intersphincteric fistula

Grade 2: Intersphincteric fistula with abscess or secondary tract

Grade 3: Transsphincteric fistula

Grade 4: Transsphincteric fistula with abscess or secondary tract within the ischioanal fossa

Grade 5: Supralevator and translevator disease

V. Conclusion

Perianal fistulas are associated with numerous complications like secondary tracks and abscess formation . Complete evaluation of these complications is required to prevent residual and recurrent disease. Also, to prevent injury to external sphincter and resultant fecal incontinence, it is necessary to establish the relationship of sphincter with the fistulous tracts. MRI satisfies all these requirements of surgeons and helps in surgery planning. Contrast enhanced MRI aids in the detection of primary and secondary tracks, as well as complications such as abscesses, allowing the surgeon to determine the best treatment strategy.

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