

MRI Assessment of Perianal Fistula

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Abstract

Background: A perianal fistula causes significant morbidity in patients. Previous to MR examination classification of perianal fistulas was done by the surgical approach. Clinical findings derived from a combination of digital rectal examination, proctosigmoidoscopy and surgical exploration. Failure to identify complications like abscess and secondary track would consequent in recurrence of the disease and treatment failure. **Subjects and Methods:** From November 2019 to June 2021 (1.5 years), around 50 patients who have perianal fistula clinically identifies and referred for MR fistulogram to our department of PDU medical college, and hospital, Rajkot were included in the study. **Results:** Total 50 patients were in our study. 34 patients were males (68%) And 16 patients were females (32%). The intersphincteric fistula was the most prevalent type of fistula seen in 19 of the patients (50%). The most common age group affected by fistulas was 41 to 50 years (38%). With reference to St James's University Hospital Classification grade I fistulas were the commonest fistula and was found in 19 patients (38%). 22 patients out of 50 showed contrast enhancement which helped in the diagnosis of secondary tracts and abscesses better. Surgical findings and MRI findings for grades 3 to 5 were concordant. While Grade 1 and 2 fistulas showed little discrepancies in identification. Drainage of abscess was done in 4 patients (8%) which were in accordance with MRI findings. **Conclusion:** MRI imaging is most advantageous because of excellent soft tissue enhancement, detailed evaluation of track and its relation to anal sphincter, related complications, and coexisting secondary tracts. All this will help in better surgical approach and outcome and by this better prognosis of the disease.

Keywords: GIT- Gastro Intestinal Tract, MRI- Magnetic Resonance Imaging, Perianal fistula, contrast.

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Introduction

A fistula defined as an abnormal track between 2 structures or organs or between an organ and the skin of the body. In our case, it is an abnormal track between the anal canal and perineal skin surface. Perianal fistula is important condition of the gastrointestinal tract which leads to significant morbidity. Younger male patients are affected with significant pain.^[1,2,3,4,5]

The main contribution of perianal fistulas started from Goodsall and Parks. Tuberculosis and inflammatory bowel disease are thought to be related to perianal fistulas.^[6]

The anorectal fistulas are classified as intersphincteric, trans sphincteric, extra sphincteric, or supra sphincteric. Exact anorectal anatomy is needed for management of anorectal fistulas. Parks and St James University Hospital classifications are used for fistula.^[7,8]

MRI with contrast helps in the identification of primary and secondary tracks, and associated abscesses and hence helps

the surgeons to plan an appropriate treatment plan.^[9]

Aims & Objectives

To demonstrate the role of MRI in diagnosis, evaluation, classification, and finding complications of perianal fistula.

Subjects and Methods

Sample Size = 50 Patients

Study Design = Hospital-based retrospective observational study.

Duration of Study = From November 2019 to June 2021 (1.5 years)

Place of Study = PDU medical college and hospital, Rajkot.

Instruments Used – 1.5T MRI machine.

Inclusion Criteria

All Suspicious and Diagnosed cases of perianal Fistula Referred to Our Department.

Exclusion Criteria

Patients not willing to be part of study.

Machine Used

1.5T GE MRI machine.

Patient consent taken with proper information about procedure.

All risks and benefits were explained.

A written consent also taken from patient or his relatives for the same.

Observations taken and statistical analysis done.

St. James University Hospital Classification

Grade 1: Simple Linear Intersphincteric Fistula:

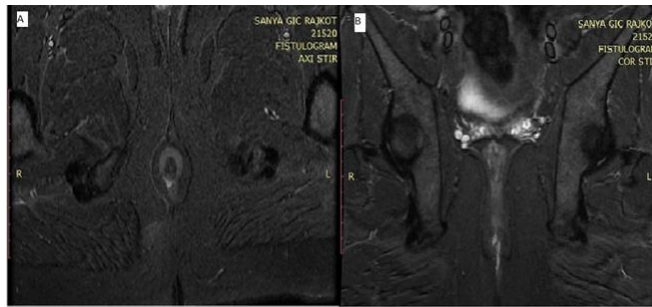


Figure 1: A) Axial and 1B) Coronal STIR WI shows linear hyperintense track associated with internal opening at 6 o'clock and involves only internal anal sphincter suggestive of simple intersphincteric fistula.

Grade 3: Transsphincteric Fistula

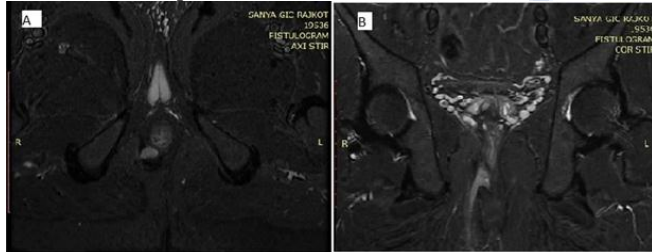


Figure 2: A) axial and 2B) coronal STIR WI shows linear hyperintense track involving both internal and external sphincter with internal opening at 7 o'clock position suggest simple transsphincteric fistula.

Grade 4: Transsphincteric Fistula with Abscess and Secondary Track

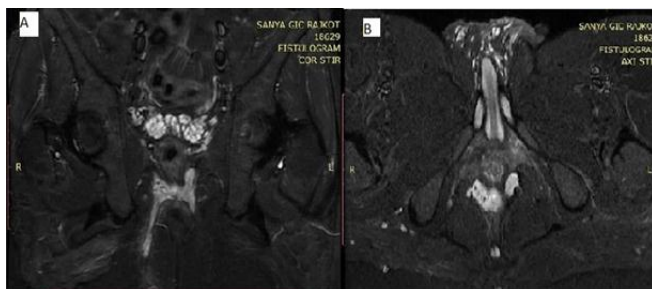


Figure 3: A) Coronal and 3B) Axial STIR WI show hyperintense track involving both internal and external anal sphincter with horse-shoe shaped abscess at intersphincteric region. Small secondary track also visualized extending towards pelvis from abscess.

Findings consistent with transsphincteric fistula with abscess and secondary track.

Results & Discussion

Table 1: ST James Grading

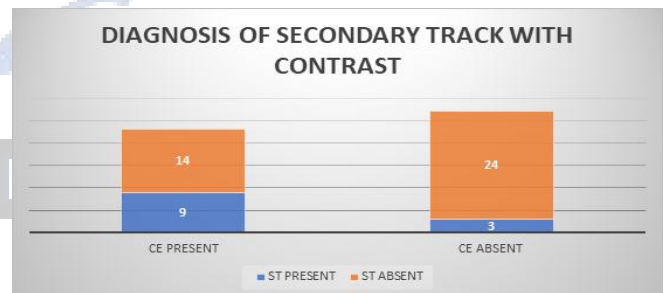
St James Grade	No Of Patients	Percentage
I	19	38%
II	6	12%
III	14	28%
IV	8	16%
V	3	6%

Most common grade is Grade I fistulas which was noted in 19 patients (38%) follow by grade III fistulas which were noted in 14 patients (28%). Grade II fistulas were noted in 6 patients (12%). Grade IV fistulas were found in 8 patients (16%) and grade V fistulas are found in 3 patients (6%).

Table 2: Correlation During Surgery

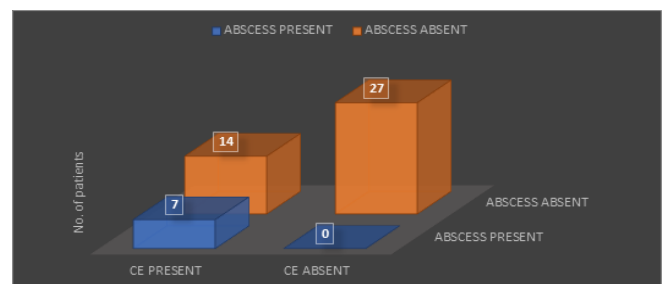
Correlation IN	NO OF	Percentage
Surgery	Patients	E
Done	43	86%
Not done	3	6%
Other	4	8%

Treatment procedure done in our institute is fistulotomy. And for abscesses, abscess drainage is preferred. Fistulotomy was performed in about 43 out of 50 patients, Abscess drainage was performed in 4 patients (8%). Surgery was not done for another 3 patients (6%) because patients were not willing for surgery.



Graph 1: Diagnosis of 2° Track Using Contrast

Secondary tracts were found in 12 patients, from which contrast enhancement was found in 9 patients, that helped in delineation of secondary tracts. Rest of the 38 patients without secondary tracts, contrast enhancement was noted in 14 patients that suggest active inflammation.



Graph 2: Abscess diagnosis Using Contrast

All 7 patients with abscess showed contrast enhancement

Table 3: MRI grading with surgical concordance

St James	No of patients	No of patients with	No of	MRI-surgical
Grade	Graded as per	Concordant surgical	Patients not	Concordance
Category	MRI	findings	operated	
I	19	14 (4 patients per-operatively categorized as grade II)	1	Sensitivity-100% Specificity-88.23%
II	6	6	-	Sensitivity-100% Specificity-100%
III	14	14	1	Sensitivity -100% Specificity-100%
IV	8	8	-	Sensitivity -100% Specificity-100%
V	3	3	1	Sensitivity -100% Specificity-100%

14 out of 19 patients in our study were classified as grade I had this type of fistula and rest 4 patients had grade II fistula on the operative finding. With analysis, all these 4 patients had secondary tracts which was found in operative finding. The sensitivity and specificity for MRI fistulogram grade I and II fistulas were found in the order of 100%, 88.23%, and 60%, 100%. For rest of the grades, the sensitivity and specificity were 100% and 100%.

Discussion

50 patients were referred for MRI fistulogram to the Department of Radiodiagnosis of PDU medical college & hospital. Gadolinium-enhanced MR fistulogram was performed. They were followed up to surgery and operation findings were compared with the MRI findings.^[10]

Out of 50 patients of study, 34 patients were males (68%). And 16 patients were females (32%).

50 patients included in the study group, intersphincteric type was most common and trans sphincteric type [Table 1] was second most common. This finding correlated with a study done by Parks et al (1976), he reported intersphincteric type of fistula to be the commonest in their study.^[11] These results were also similar with the study done by Morris et al. he mentioned in his study that about 70% of all perianal fistulas were intersphincteric fistulas and transsphincteric fistulas constituted 20% of the total.^[12]

In our study age group are from 20 to 70 years. Most common of them were in the age group of 30- 50 years.

While analyzing of the fistulous tracts, most of the patients (42 out of 50) had only one external opening. External opening between 4 and 6'o clock position was commonest. Second common location of opening is the 7 to 9'o clock position.

Amongst the internal openings, it was single in a majority of

patients (41 out of 50). 5'o clock position was most common. Correlation with intraoperative and MRI findings about the site of the openings was exceptional.

In this study, classification of perianal fistulas was done based on St James's University Hospital Classification. Grade I fistulas were found most common which was found in 19 patients [Table 1]. Followed by grade III fistulas which were found in 14 patients. Findings are in accordance with the study done by Ozdil Baskan et al.^[13]

Comparing sex of the patients, it was noted that among both males and females, intersphincteric fistulas are most common, trans sphincteric type are second common.

It was observed that inter sphincteric and trans sphincteric fistulas were common in age group of 41-50 years. Extrasphincteric fistulas associated with other etiologies are common in the age group of 30-40 years.

In our study, grade I and III fistula were common amongst male patients. and grade I and III were common in female patients.

Total 12 out of 50 patients had secondary tracts. Delineation of all these tracts is essential for the complete eradication of the disease. Without preoperative identification of secondary tracts recurrence of the disease is common.^[14] Active fistulous tracts shows well enhancement after gadolinium scan. With contrast scan demonstration of fistulous tracts was better. It was found that on the whole, of the 12 patients who had secondary tracts, 9 patients showed contrast enhancement for delineation of secondary tracts [Graph 1]. This is in concordance with the study done by Dariusz et al.^[15] An enhancement was greater for grades II and IV.

Abscesses were present in 7 out of 50 patients in our study. Out of that 4 patients had a simple abscess, 2 patients had horseshoe abscesses. One patient had an abscess in the ischiorectal fossa. A contrast enhancement was found in all 7 patients that helped in demonstrating the extent of the abscess [Graph 2]. Inference can be drawn that contrast study is absolutely necessary for assessment of complications arising due to perianal fistulas. Result is superior to result given by Maier et al in his study,^[8] who showed an 84% sensitivity of MRI for the identification of perianal fistulas and abscesses. In his study 15% false-positive results which were eliminated in our study. Better results of our study can be due to the use of contrast-enhanced imaging. So, MRI with contrast should be routinely done in MRI protocols of perianal fistula examination, This was well in correlation with the study done by M.E. Agha et al.^[16]

Among total 50 patients, 16 patients showed contrast enhancement of secondary tracts and abscesses and most of the patients (12 patients) were in the age group of 31- 50 years in whom the incidence of complications because of perianal fistula was high. To conclude, all the middle age patients should undergo contrast study as the prevalence of complications is high.

In this study, correlation between the fistula on MRI and the surgical findings was significant. Fistulotomy surgery was performed in 43 out of 50 patients [Table 2] intraoperative findings correlated well with the MRI findings for grades 3 to 5. Correlation between surgical and MRI findings was significant in our study with a "p-value" of 0.01. Grade 1 and 2 fistulas showed little discrepancies in the identification of

tracts. MRI fistulogram could not delineate the secondary tracts in grade 2 intersphincteric type which was missed in 4 patients and wrongly classified as grade 1 [Table 3]. Drainage of abscess was done in 4 patients which were also in accordance with MRI findings. The result obtained (86%) was comparable with the result obtained from the previous study conducted by Lunniss et al which reported a concordance rate of 86- 88% between MRI and surgical findings.^[9]

In another study by Beets- Tan et al, who compared the results of MRI with that intraoperative finding, the sensitivity and specificity were 100% and 86% respectively. For a horseshoe fistula sensitivity and specificity were 100% and 100% and for internal openings, 96% and 90% respectively.^[10]

As mentioned above, the active fistulous tracts show good enhancement. In our study, it was noted that the enhancement was greater for grades II and IV types of fistulas. Thus, it could be concluded that contrast study is indispensable for good demonstration of abscess and secondary fistulous tracts.

Conclusion

MR imaging does an important role in preoperative patient management. MRI helps in the delineation of fistulous tracks, secondary infections, and the relationship between the fistula with the anal sphincteric complex.

The following were assessed in our study: type of fistula, the position of the internal opening, grading of fistula by St. James's University Hospital MRI Classification, and MRI findings was correlated with surgical findings. Although Perianal fistula is not that common problem but chances of recurrence are high. Rate of the complications like secondary tracks and abscess cavities are very high. Proper assessment of these complications is required otherwise it results in residual and recurrent disease. So, a complete preoperative assessment of perianal fistulas is must. Also, for prevention of injury to the external sphincter which result in fecal incontinence, it is must to establish the relationship of the sphincter with the fistulous tracks.

MRI imaging gives all these necessary details to surgeons and helps in the planning of surgery. MRI provides good anatomic contrast of the fistula and also delineates the secondary tracks and abscesses. MRI with contrast can detect active inflammation of tracks. It can also distinguish between scar and active inflammation. Correct delineation of perianal fistulae and proper grading of fistulae are must for ensuring good surgical outcome. Correlation between operative and MRI findings was significant in this study with a "p-value" of 0.01. Hence, an MR fistulogram with contrast enhancement can give comprehensive guidance for the surgeons in the management of perianal fistulas.

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