

## ACCURACY OF MRI AND ENDOANAL SONOGRAM IN FISTULA IN ANO COMPARING WITH OPERATIVE FINDINGS

Sadhan G<sup>1</sup>, Syed Mahmood Ayaz<sup>2</sup>, Sajid Ibrahim Ali<sup>3</sup>

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Corresponding Author:  
**Dr. Sajid Ibrahim Ali,**  
Email: sajid.itga@gmail.com  
ORCID: 0000-0002-0539-2651

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<sup>1</sup>Senior Resident, Department of General Surgery, MMC and RI Mysore, Karnataka, India.

<sup>2</sup>Consultant General and Laparoscopic Surgeon, Al Ansaar Hospital, No 3208, 3210/L1, Mohammed Sait Block, Lashkar Mohalla, Mysore, Karnataka, India.

<sup>3</sup>Assistant Professor, Department of General Surgery, SDM College of Medical Sciences and Hospital, Manjushree Nagar, Sattur, Dharwad, Karnataka, India.

### Abstract

**Background:** The study aims to determine accuracy of MR Fistulogram and endo anal ultrasound in cases of perianal fistula taking operative findings as gold standard. To determine accuracy of MR Fistulogram and endo anal ultrasound in cases of perianal fistula taking operative findings as gold standard to determine sensitivity and specificity of MRI and endoanal sonogram. **Materials and Methods:** This comparative study includes 29 patients with perianal fistula from surgical units of KMC affiliated hospitals. All patients will undergo MR Fistulogram and Endoanal sonogram preoperatively after clinic evaluation. Both the imaging results are compared with intra operative findings. **Result:** MR Fistulogram showed 100% sensitivity in identifying internal openings, TRUS was 86.6% sensitive in identifying internal openings. Both MRI and EUS were accurate equally in identifying external opening. MR Fistulogram showed 100% sensitivity in identifying tracks, whereas TRUS was 75.5% sensitive in identifying tracks. **Conclusion:** MR Fistulogram is the best modality in complete assessment of fistula-in-ano preoperatively.

## INTRODUCTION

The anal glands are located throughout circumference of anal canal. Infected anal glands spread infection through anal lumen to sphincter muscles, from which secondary spread can occur in all directions.<sup>[1,2]</sup> Theories of the causes of perianal fistulas are supposed to result from obstruction of the anal gland that may lead to infection of these glands and formation of abscesses and external rupture decompression of the abscesses outside forming route for drainage and fistula track formation. The fistula track most commonly arises internally at the dentate line, at middle part of anal canal.

Peri-anal fistula (Fistula in ano) is a common disease with high incidence of recurrence even after proper treatment. Recurrence is regularly caused by infection that was not detected by surgery and thus gone untreated. Recurrence rate after surgery is variable depending on the type of the operation, may reach up to (13.3%) with a median time to recurrence of 7.5 months. Interpretation of MRI of perianal fistula necessitates knowledge of pathophysiology, applicable anatomy of the pelvis, and fistula types, classification plus its implication for treatment. TRUS is used to assess fistula track

and its course through sphincter complex, and also assessment of internal opening. The drawbacks being inability to assess extra-sphincteric and high fistulas due to limited field of view.<sup>[3]</sup>

Pelvic MRI is the preferable imaging modality for recognition and assessment of perianal fistulas as it offers the capacity to achieve high-spatial-resolution and multiplanar images, enabling it to be the preferable imaging modality for recognition and grading of perianal fistulas. It allows detection of the infected tracts and abscesses plus detailed assessment of the relationship between the fistula to the anal sphincter complex. There are two main classification systems for peri-anal fistula; the classification suggested by Parks et al. in 1976, which was mainly developed for surgical use, and the classification by St James University Hospital that was developed based on an MRI examination.<sup>[4]</sup> Hence this study was conducted to determine accuracy of MR fistulogram and endo anal ultrasound in cases of perianal fistula taking operative findings as gold standard to determine sensitivity and specificity of MRI and endoanal sonogram.

## MATERIALS AND METHODS

Study design-Prospective study comparing MRI and endoanalsonogram in cases of perianal fistula. Patients from surgical units of KRH (MMC and RI) and few private hospitals with perianal fistula. 29 patients were included in this study.

### Inclusion Criteria

- Consenting for the study
- Age:  $\geq 18$  years
- Cases of primary perianal fistula

### Exclusion Criteria

- Age  $< 18$  years
- Patients not consenting for study
- Recurrent perianal fistula.

Sample size given by

$$n = Z^2 L \text{SPE}(1-\text{SPE}) / e^2(1-\text{prevalence})$$

$$Z_L = 1.96 \text{ at } 95\% \text{ C.I.}, e = 10\% \text{ } n = 29.$$

29 patients with perianal fistula from surgical units of KRH and private hospitals in Mysore. All patients will undergo MR Fistulogram and Endoanal Sonogram preoperatively after clinic evaluation. Both the imaging results are compared with intra operative findings.

## RESULTS

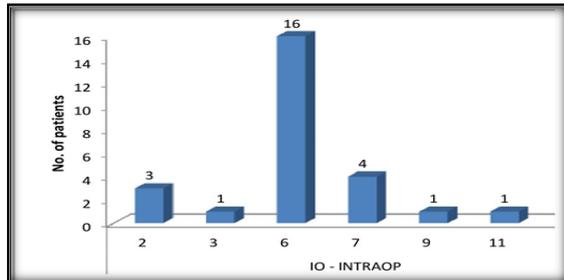


Figure 1: Intraop assessment of internal opening

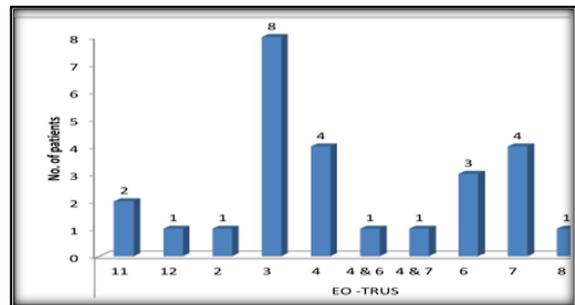


Figure 2: External opening assessment with TRUS

13.8% of patients were in age group between 21-30, 27.6% in age groups between 31-40, 34.5% between 41-50, 24.1% between 51-60yrs, out of which 17.8% were females and 82.2% were males. MR Fistulogram showed 100% sensitivity in identifying internal openings, TRUS was 86.6% sensitive in identifying internal openings. Both MRI and EUS were accurate equally in identifying external opening. MR Fistulogram showed 100% sensitivity in identifying tracks, whereas TRUS was 75.5% sensitive in identifying tracks.

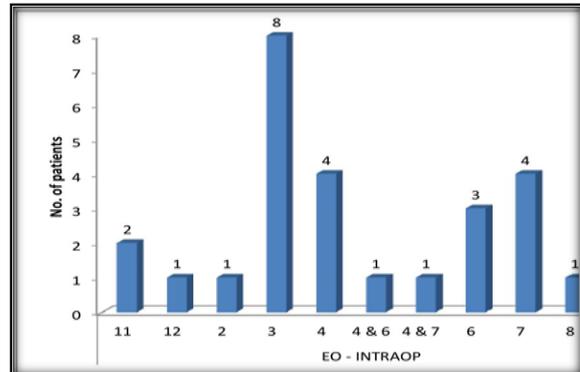


Figure 3: External opening assessment intraop

Table 1: Percentage of age groups presenting with fistula in ano

|         | Frequency | Percent |
|---------|-----------|---------|
| 21 - 30 | 4         | 13.8    |
| 31 - 40 | 8         | 27.6    |
| 41 - 50 | 10        | 34.5    |
| 51 - 60 | 7         | 24.1    |
| Total   | 29        | 100.0   |

Table 2: Distribution of Male and Female

|       | Frequency | Percent |
|-------|-----------|---------|
| F     | 5         | 17.2    |
| M     | 24        | 82.8    |
| Total | 29        | 100.0   |

Table 3: Internal openings of MRI, EUS and intraop

|        |   | IO - INTRAOP |       |       |       |       |       |       |       |
|--------|---|--------------|-------|-------|-------|-------|-------|-------|-------|
|        |   | 2            | 3     | 6     | 7     | 9     | 11    | 12    | Total |
|        |   | Count        | Count | Count | Count | Count | Count | Count | Count |
| IO-MRI | 2 | 3            | 0     | 0     | 0     | 0     | 0     | 0     | 3     |
|        | 3 | 0            | 1     | 0     | 0     | 0     | 0     | 0     | 1     |
|        | 6 | 0            | 0     | 16    | 0     | 0     | 0     | 0     | 16    |
|        | 7 | 0            | 0     | 0     | 4     | 0     | 0     | 0     | 4     |
|        | 9 | 0            | 0     | 0     | 0     | 1     | 0     | 0     | 1     |

|           |                |   |    |    |   |   |   |    |    |
|-----------|----------------|---|----|----|---|---|---|----|----|
|           | 11             | 0 | 0  | 0  | 0 | 0 | 1 | 0  | 1  |
|           | 12             | 0 | 0  | 0  | 0 | 0 | 0 | 3  | 3  |
|           | Total          | 3 | 1  | 16 | 4 | 1 | 1 | 3  | 29 |
| IO - TRUS | 11             | 0 | 0  | 0  | 0 | 0 | 1 | 0  | 1  |
|           | 12             | 0 | 0  | 0  | 0 | 0 | 0 | 1  | 1  |
|           | 2              | 3 | 0  | 0  | 0 | 0 | 0 | 0  | 3  |
|           | 3              | 0 | 1  | 0  | 0 | 0 | 0 | 0  | 1  |
|           | 6              | 0 | 0  | 14 | 0 | 0 | 0 | 0  | 14 |
|           | 7              | 0 | 0  | 0  | 4 | 0 | 0 | 0  | 4  |
|           | 9              | 0 | 0  | 0  | 0 | 1 | 0 | 0  | 1  |
|           | not identified | 0 | 0  | 2  | 0 | 0 | 0 | 2  | 4  |
| Total     | 3              | 1 | 16 | 4  | 1 | 1 | 3 | 29 |    |

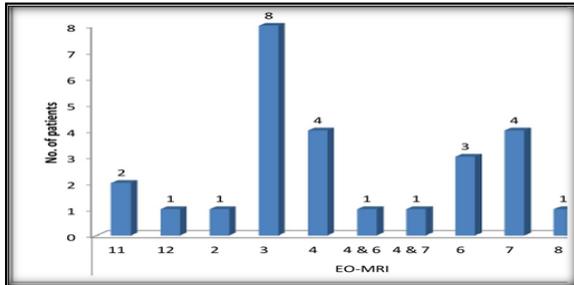


Figure 4: external opening assessment with MRI

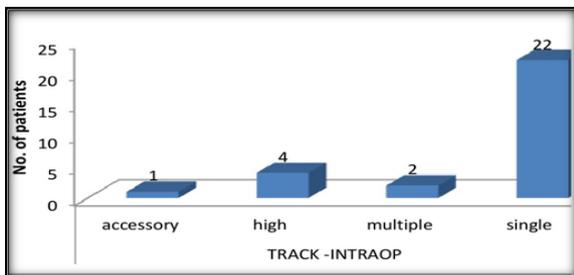


Figure 5: track assessment intraop

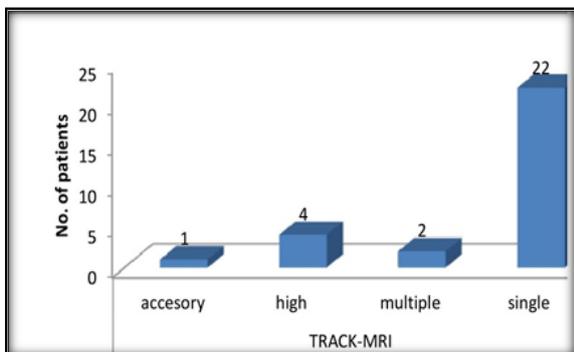


Figure 6: track assessment with MRI

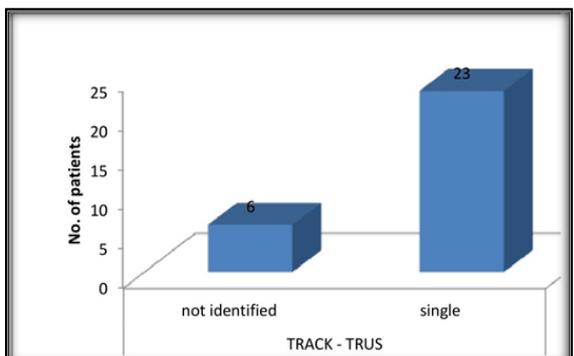


Figure 7: Track assessment with TRUS

## DISCUSSION

Perianal fistula is one of the common disease which occurs mainly due to cryptoglandular disease. Accurate diagnosis of fistula and track which are clinically difficult to assess is important in guiding surgical management and prevention of further recurrence. MR Fistulogram and TRUS are important modalities in diagnosing perianal fistulas with clinical assessment preoperatively.

MRI has been the routine modality preferred for accurate diagnosis of multiple tracks and complex fistulas, high fistulas compared to TRUS. In previous studies MRI has been proven as preferred and accurate modality.

This study was done to prove the best modality for preoperative diagnosis of perianal fistula disease by comparing MR fistulogram with TRUS done preoperatively and comparing findings with intraoperative findings. This study assessed the sensitivity of both modalities. Drawbacks was that specificity could not be assessed.

Buchanan et al,<sup>[5]</sup> in their study showed that MR increases the accuracy of diagnosis by 10% in comparison to EAUS. Additionally, there was a threefold decrease in recurrence rate after surgical interventions based on appropriate diagnostics with the use of MR only.

Maier et al,<sup>[6]</sup> showed a statistically higher efficiency in the detection of perianal fistulas and abscesses in 39 patients with the use of magnetic resonance (84% sensitivity) as compared to endosonography (60% sensitivity). False-positive results were present in 6 patients (15%) examined with MR and in 10 (26%) examined with endosonography.

Beets-Tan et al,<sup>[7]</sup> assessed the usefulness of the method by comparing the results of MRI in patients before surgery with intraoperative findings. They proved that its sensitivity and specificity for fistulous canal detection amounted to 100% and 86%, respectively. For a horseshoe fistula this was 100% and 100%, and for internal openings – 96% and 90%. In the above study conducted male: female prevalence was 4:1, showing male predominance in perianal fistula disease. MR Fistulogram and TRUS was done and internal opening, external opening and track was compared with intraoperative findings.

MRI was 100% sensitive in identifying internal opening and TRUS was 86.6% sensitive in identifying internal openings, MRI was 99% sensitive in identifying tracks whereas TRUS was 75.5% sensitive. Study concluded that MR Fistulogram is best modality compared to TRUS in preoperative diagnosis of perianal fistula, complex fistulas and high fistulas.

## CONCLUSION

MR Fistulogram is the best modality in complete assessment of fistula-in-ano preoperatively.

- Drawbacks of MRI: high cost.
- Endoanal sonogram is the second preferred modality.
- Drawbacks of endoanal sonogram: failure to reach and visualise high tracts, multiple tracts or complex fistulas.

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