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Cross sectional study of MR fistulography in the evaluation of perianal fistulae and its surgical correlation

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Abstract: *Aims and objectives:* To evaluate the diagnostic accuracy of Magnetic Resonance Fistulography in the assessment of the perianal fistulae. *Background:* The success of the surgical approach for perianal fistulae treatmentis closely associated with the preoperative assessment. MR imaging plays a key role in describing the fistulae in relation to the anatomy of the perianal region. This has been categorised according to the involvement of the fistulous tract in relation to the sphincters and its extension of the disease into five imaging based grades. This helps in selecting the appropriate surgery in order to reduce the load of recurrences. *Materials and methods:* Over a period of 6 months, a cross sectional study was conducted among 18 patients who were admitted with the features of perianal fistulae at Al-Ameen Medical College Hospital , Vijayapura. The average age of patients was 44.5 years, ranging from 33 to 72 years, with the number of females 22.2% (n = 4) and males 77.8% (n = 14). The pre-operative MR imaging assessment was studied and correlated with intra operative surgical findings. *Results:* The accuracy of MR Fistulography was consistent with 17 out of 18 surgical findings, except for one case, which was falsely over diagnosed. *Conclusion:* To conclude, MR Fistulography is an essential investigation of choice in the evaluation of perianal fistulae. It helps in accurate identification of the type of perianal fistula in relation to the anal sphincters and adjacent anatomical structures. Hence this investigation should be recommended routinely in preoperative work up for precise surgical management of perianal fistulae.

Keywords: Perianal Fistulae, MR Fistulography, St. James University Hospital Grading, Surgical correlation.

Introduction

As per the definition, a fistula is any abnormal passage connecting two epithelial surfaces. Perianal fistulae commonly originate from anal gland infections leading to chronic inflammation of perianal tissues by forming a tract between the skin of the perineum and the anal canal [1]. Conservative line of therapy has little treatment value, and hence patients eventually undergo surgery. The success of the surgical approach is closely associated with the preoperative evaluation as the post-operative recurrences are high in blind surgeries. Therefore, it is of utmost importance to assess the course of the fistula and the presence of associated findings to overcome the possible failures [1-2].

MRI Fistulography has become the method of choice for evaluating the perianal fistulae due to its ability to display the extensions of the disease and its characterization, aiming for the complete surgical elimination of all sources of infection and ultimately reducing the load of recurrences [3]. The objective of this study is to present our experiences in the diagnostic accuracy of the application of Magnetic Resonance Fistulography in imaging and assessment of perianal fistulae along with its comparison to the operative findings with a brief description of the technique, illustration of relevant normal anatomy, and classification of perianal fistulae based on the St. James University Hospital grading [1, 3-4].

Material and Methods

Imaging Findings and Procedure Details:

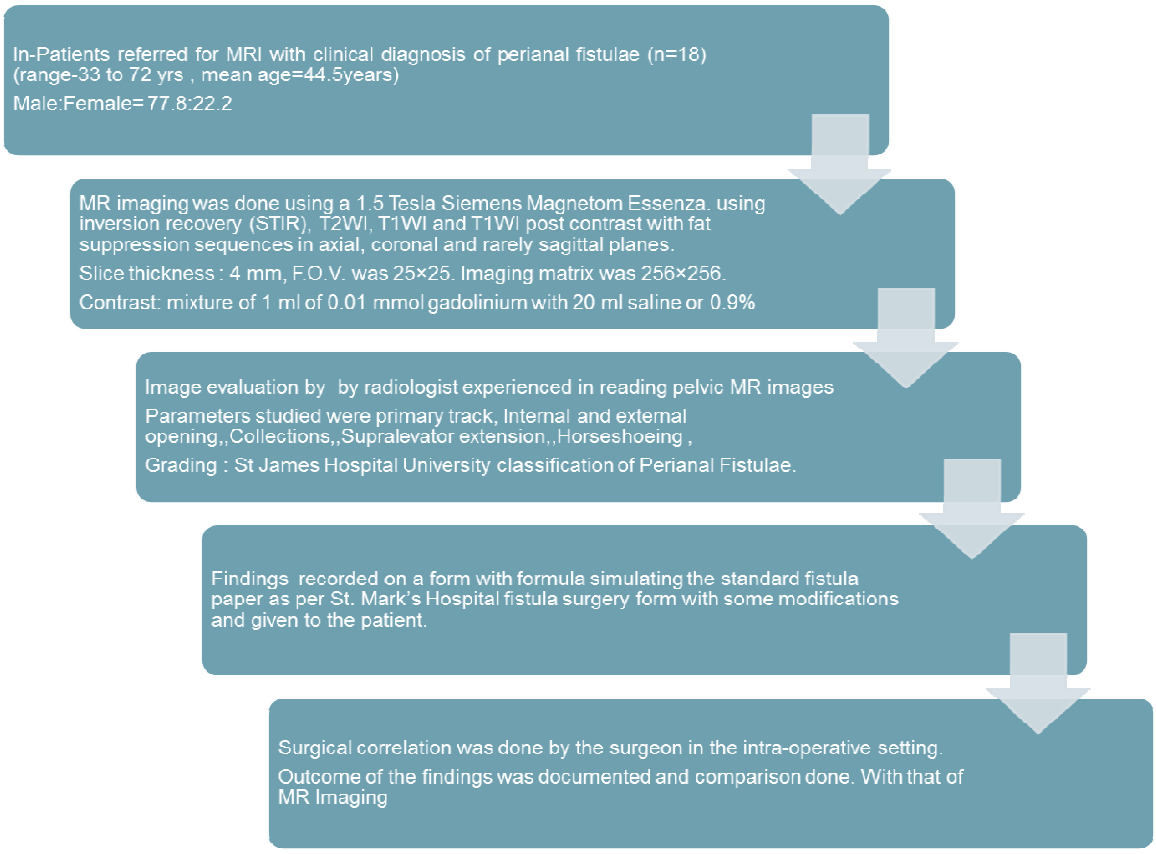
Over a period of 6 months, a cross sectional study was conducted among 18 patients who were admitted at our institution with the

features of perianal fistulae. The average age of patients was 44.5 years, ranging from 33 to 72 years, with the number of females 22.2% (n = 4) and males 77.8% (n = 14).

All the patients with suspected perianal fistulae with features of discharge/infection were included. After preoperative clinical examination, MR imaging was done using a 1.5 Tesla Siemens MagnetomEssenza. Imaging was done using inversion recovery (STIR), T2WI, T1WI and T1WI post contrast with fat suppression sequences in axial, coronal and rarely sagittal planes. MR fistulogram with instillation of contrast (mixture of 1 ml of 0.01 mmol gadolinium with 20 ml saline) or 0.9% saline through the external opening was performed in few cases. Slice thickness was 4 mm, F.O.V. was 25×25. Imaging matrix was 256×256.

The images were evaluated for the presence of the primary fistulous tract, internal opening and its relations to the sphincters. Secondary extensions, any abscesses or collections were also recognized.

Figure-1: Descriptive flow chart of the present study



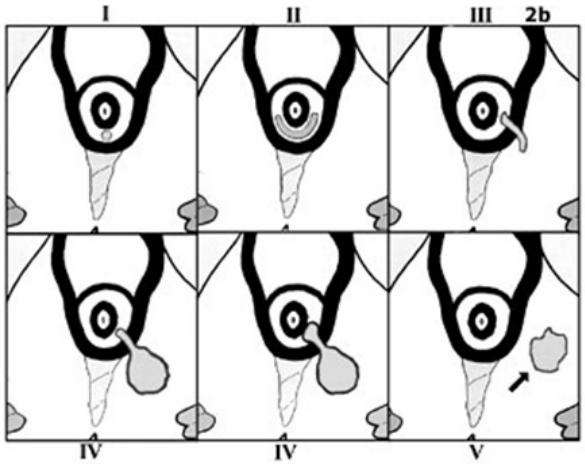
Teaching / Educational Importance

The fistula is identified as hyper intense tubular structures on T2WI and abscess appears as fluid filled cavities either high or low signals on T2WI. These findings were compared to the operative findings [5]. Normally the external anal sphincter (a striated muscle) is clearly visualized on MRI. It is hypo intense on T1W, T2W, and fat-suppressed T2W images, and is bordered laterally by the fat in the ischioanal fossa [5-6].

The internal sphincter (a smooth muscle) is hypo intense on T1W and T2W TSE images and is relatively hyper intense on fat-suppressed T2W images. It shows enhancement on postgadolinium T1W images [2, 5]. The coronal images depict the levatoranimuscle, the identification of which is important to distinguish supralevator from infralevator infections [2, 5].Perianal fistulae are classified according to the route taken by the primary tract that links the internal and

external openings on the basis of radiologic anatomy on pelvic MRI, which is known as the St. James' University Hospital Classification of perianal fistulae [1, 3].

Figure-2: Diagrammatic representation of St.James University Hospital Classification of Perianal Fistulae

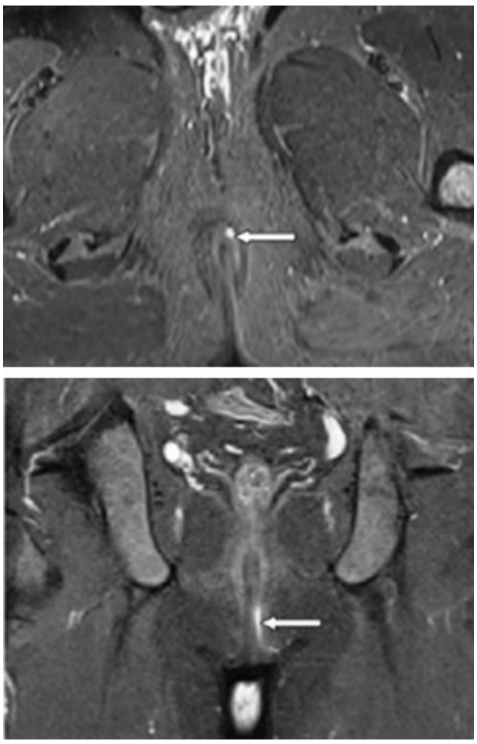


- Grade I - Simple, linear intersphincteric fistula
- Grade II - Intersphincteric fistula with intersphincteric abscess or secondary fistulous tract
- Grade III - Trans-sphincteric fistula
- Grade IV - Trans-sphincteric fistula with abscess or secondary tract within ischioanal / ischiorectal fossa
- Grade V - Supralevator and translevator disease

Figure-3: MR Imaging of normal perianal region

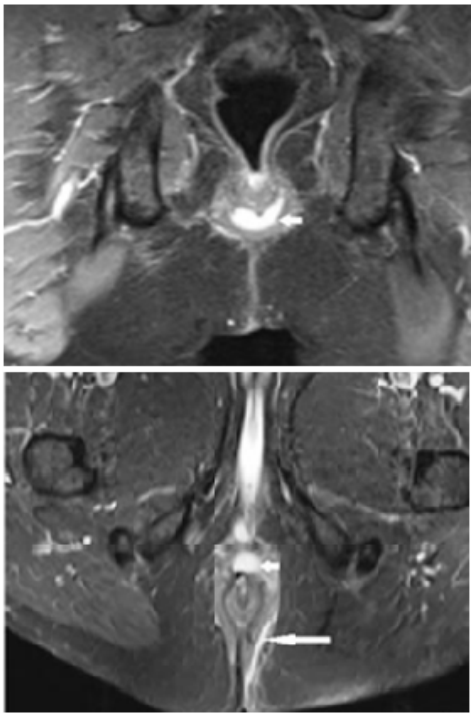
1. Apposed anal mucosa.
2. Internal sphincter.
3. External sphincter (pubococcygeus part of levatorani).
4. Iliococcygeus part of levatorani.
5. Right Ischioanal fossa.
6. Supralevator plane.

Figure-4: Type I, Simple Intersphincteric Fistula



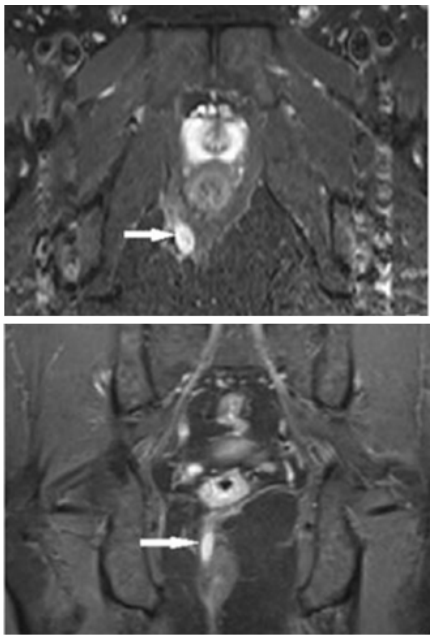
MR Fistulography of a 36 year old male patient, who presented with perianal discharge since 1 month. Axialand Coronal STIR images showing simple, intersphicteric fistula-in-ano (arrows).

Figure-5: Type II,Intersphincteric fistula-in-ano with abscess



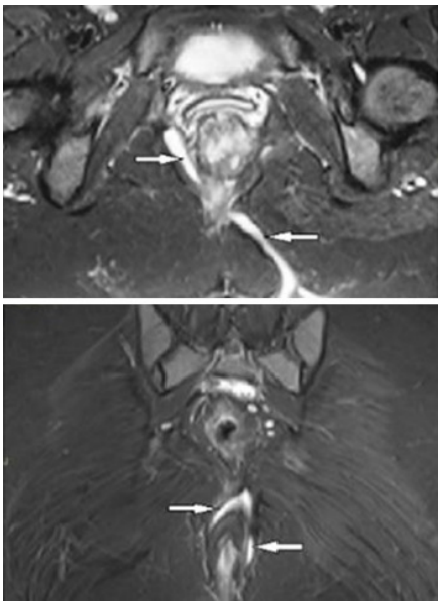
MR Fistulography of a 49 year old female patient, who presented with perianal discharge and pain since 4 months. Coronal and Axial STIR images showing intersphincteric tract (long white arrow) with an intersphincteric abscess (short arrows).

Figure-6: Type III, Transsphincteric fistula-in-ano



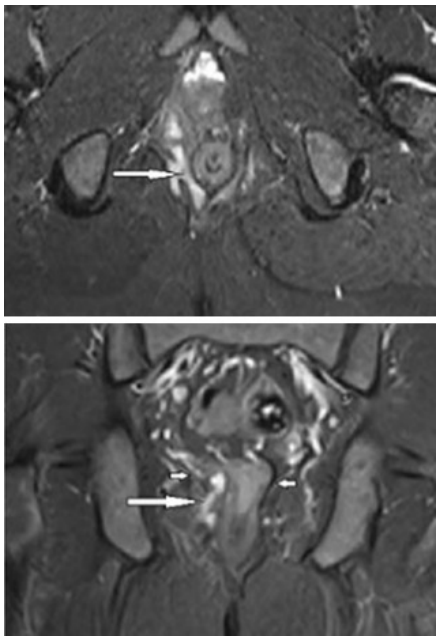
MR Fistulography of a 43 year old male patient, who presented with perianal discharge and pain since 3 months. Axialand Coronal STIR images showing a fistulous tract (white arrows) which has crossed the external sphincter and lying in the left ischio-rectal fossa.

Figure-7: Type IV, Transsphicteric fistula-in-ano



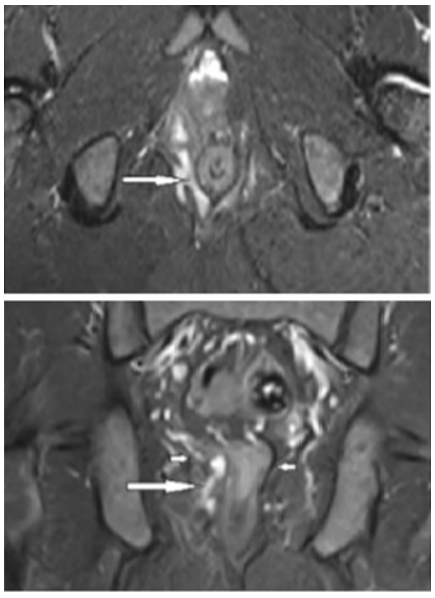
MR Fistulography of a 56 year old male patient, who presented with perianal discharge and pain since 6 months. Axial and Coronal images showing multiple branching fistulous tracts in the ischio-anal fossa (white arrows).

Figure-8: Type IV, Transsphincteric fistula-in-ano



MR Fistulography of a 59 year old female patient, who presented with on & off fever, perianal discharge and pain since 1 year. Axial and Coronal STIR images showing multiple branching fistulous tracts in the ischio-anal fossa (white arrows).

Figure-09: Type V, Fistula-in-ano with Supralevator extension



MR Fistulography of a 62 year old male patient, who presented with foul smelling perianal discharge, pain on & off fever since 8 months. Axial and Coronal STIR images showing fistulous tract (long white arrows) which is extending above the levator sling (short arrows).

Results

Table-1: Frequency and percentage of Gender wise distribution Perianal Fistulae

Gender	Frequency	Percent (%)
Males	14	77.8
Females	04	22.2
Total	18	100.0

Table-2: Frequency and Percentage of MRI findings according to St. James University Hospital Classification of Perianal Fistulae

Grades	Frequency	Percent (%)
GRADE- 1	09	50.0
GRADE- 1I	03	16.6
GRADE- 1II	02	11.1
GRADE- 1V	03	16.6
GRADE- V	01	5.5
Total	18	100.0

Figure-10: Graphic representation of MRI findings according to St. James University Hospital Classification of Perianal Fistulae

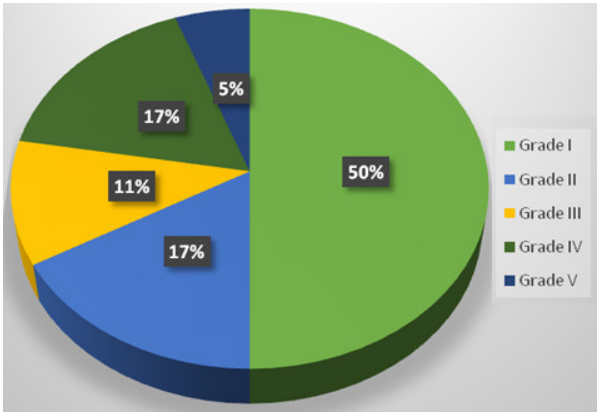


Table-3: Surgical correlation in relation to Frequency and Percentage of MRI findings according to St.James University Hospital Classification of Perianal Fistulae

St. James university & hospital classification for perianal fistulae	MRI findings	Percentage of MRI findings	Surgical correlation	Percentage of surgical correlation
GRADE - I	09	50.0	09	50.0
GRADE - II	03	16.6	03	16.6
GRADE - III	02	11.1	02	11.1
GRADE - IV	03	16.6	02	11.1
GRADE - V	01	5.5	01	5.5
Total	18	100.0	17	94.5

Kappa value for agreement between MRI findings and Surgical correlation with respect to St. James University Hospital Grading for Perianal fistulae was 0.87 (almost perfect agreement).

Table-4: Presence of Internal Opening as a Surgical finding in relation to MRI finding

Internal opening		Frequency	Percent (%)
Agreement with Surgery	Yes	18	100.0
	No	00	00
Total cases		18	100.0

Table-5: Presence of External Opening as a Surgical finding in relation to MRI finding

External opening		Frequency	Percent (%)
Agreement with Surgery	Yes	18	100.0
	No	00	5.6
Total cases		18	100.0

Table-6: Presence of Primary tract as a Surgical finding in relation to MRI finding			
Primary Tract		**Frequency**	**Percent (%)**
Agreement with Surgery	Yes	18	100.0
	No	00	00
Total cases		18	100.0

Table-7: Presence of Secondary tract as a Surgical finding in relation to MRI finding			
Secondary Tract		**Frequency**	**Percent (%)**
Agreement with Surgery	Yes	17	94.4
	No	01	5.6
Total cases		18	100.0

Discussion

In our study, most of the Intraoperative findings were consistent with radiological descriptions of MRI fistulographies. Only in one case, according to surgery findings, it was a trans-sphincteric fistula, whereaspreoperatively it was reported as trans-sphincteric fistula with secondary tract and abscess in ischio-anal fossa [7]. MRI can sometimes give fallaciously high signal intensity in healed fibrous tracts, especially with STIR sequenceand this finding was misdiagnosed as an actively inflamed fistula in one of our cases [6-7].

Conclusion

To conclude, our results revealed that MRI is an essential useful tool in pre-operative evaluation of the perianal fistulae [5-6]. It provides high resolution images of the anatomy of the anorectal region with delicate depiction of the fistulous tracts with their associated secondary ramifications and abscesses. Contrast administration can add more information and assist discrimination between active and inactive tracts with delineation of tracts which are not usually visualized. More specifically, the axial and coronal planes of contrast enhanced FS T1W sequence images represent a significantly high accuracy (94.4%) in identification of ano-rectal fistulas.

Hence the MR Fistulography can be considered to be accurate [Table 3 to 7] and therefore recommended in preoperative work up cum surgical planning to reduce post-surgical recurrences.

References

1. Akhtar M. Fistula in Ano-An Overview. *JIMSA*. 2012; 25(1):53-55.
2. Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. *Br J Surg,* 1976; 63:1-12.]
3. Manar T, Alaat El Essawy. Magnetic Resonance Imaging in Assessment of Anorectal Fistulae and its role in management, *J Gastroint Dig Syst* 2013; 3:3.
4. Khera PS, Badawi HA, Afifi AH. MRI in perianal fistulae. *Indian J Radiol Imaging* 2010; 20:53-7.
5. Myhr GE, Myrvold HE, Nilsen G et al. Peri-anal fistulas: use of MR imaging for diagnosis. *Radiology* 1994; 191:545-554.
6. Dariusz Waniczek, Tomasz Adamczyk, Jerzy Arendt, Ewa Kluczewska, Ewa Kozińska-Marek. Usefulness assessment of preoperative MRI fistulography in patients with perianal fistulas. *Pol J Radiol,* 2011; 76(4):40-44.
7. Buchanan GN, Williams AB, Bartram CI, Halligan S, Nicholls RJ, Cohen CR. Potential clinical implications of direction of a trans-sphincteric anal fistula track. *Br J Surg,* 2003; 90(10):1250-1255.

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