VOLUME - 9, ISSUE - 11, November - 2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Radiodiagnosis

A DESCRIPTIVE CROSS SECTIONAL STUDY FOR MR IMAGING EVALUATION OF PERIANAL FISTULAS: SPECTRUM OF THE IMAGING TECHNIQUE.

Dr.Shikha Krishnani* P. G Resident, Radio-diagnosis ,D.V.V.P.F"s Medical college,Ahmednagar. *Corresponding Author

Dr.Sushil Kachewar Professor and HOD,D.V.V.P.F's Medical college,Ahmednagar

Dr.Dilip Lakhkar Professor ,D.V.V.P.F's Medical college,Ahmednagar

ABSTRACT Anorectal fistulas are chronic inflammations of perianal tissues characterized by the presence of a track lined by granulation tissue, with a connection between the skin of the perineum and the rectum or anal canal. [1,2]

The etiology includes idiopathic & iatrogenic fistulas, & fistulas secondary to other causes. [3]

Imaging from the various modalities (Conventional Fistulography, AES, CT & most recently, MR Fistulography) needs to accurately determine the exact anatomy & origin of the fistula, which is originally the most important management objective. This will define the surgical approach & ensure that treatment is complete. MRI is now generally available, & in recent years has become the pre-eminent investigation for fistula evaluation. This study aimed to determine the role of magnetic resonance imaging (MRI) and the suitable sequence for imaging the in diagnosing fistula-in-ano.

KEYWORDS : MR Fistulography,MR Sequences,Time taken for sequences.

INTRODUCTION

Perianal and anal fistulae commonly originate from anal gland infections leading to chronic inflammation of perianal tissues by forming a track between the skin of the perineum and the anal canal. [4]

Perianal fistulas may be caused by several inflammatory conditions and events, which include Crohn`s disease, pelvic infection, tuberculosis, diverticulitis, trauma during childbirth, pelvic malignancies and radiation therapy. [5]

Fistulas have traditionally been imaged by conventional fistulogram which has two main drawbacks: Firstly, the primary track and its extensions do not fill with contrast if they are plugged with pus/debris and secondly, the sphincter muscle anatomy is not imaged and hence the relation between the track, the sphincter, and the levator ani muscle is not revealed. TRUS better depicts fistulae along with their relation to the sphincter muscle complex. Its pitfalls include operator dependence, limited field of view and absence of a coronal plane of imaging. [6]

CT fistulography is bounded by the fact that attenuation values of the fistulous track, areas of fibrosis and anal sphincter muscles are similar to each other. [6]

With the advent of MRI- its superior soft-tissue contrast resolution and MPR imaging capabilities have brought a dramatic change in imaging of perianal and anal fistulas in terms of identifying the exact size, site of fistulous tracks, branching patterns and associated soft tissue changes. [7]

Several studies have investigated the accuracy of MRI in the diagnosis of perianal fistulae with sensitivities ranging from 86%–97%. [9,10]

MR Fistulography has become the method of choice for evaluating fistulae in perianal and anal region due to its power to display the ramifications of the disease and characterization, aiming for the complete surgical elimination of all sources of infection and ultimately reducing a load of recurrences. Therefore, accurate pre-surgical mapping of these tracks is vital to prevent recurrence. [11,12]

Radiologists can provide detailed anatomic descriptions of the relationship between the anal sphincter complex and the fistulae, thereby allowing surgeons to choose the best treatment option, significantly reducing the possibility of recurrence of the disease or possible secondary effects of surgery, such as fecal incontinence. [9,10]

MRI has been considered the 'gold standard' technique for the preoperative evaluation of fistula-in-ano.

MR imaging features of perianal fistulas & abscesses [8]

Condition	Pulse Sequence	Signal Intensity appearance
Fistula/Oedema	T1 WI T2 WI STIR T1- contrast-enhanced	Low/low High/high High/high Enhancing/low
Abscess	T1 WI T2 WI STIR T1- contrast-enhanced	Low High High Low, with peripheral enhancement

AIMS AND OBJECTIVES

The role of MRI in the diagnosis & evaluation of perianal & anal fistulae in terms of the following:

- To identify perianal/anal fistulae as seen on MR Fistulogram.
- Attempt to find the shortest and the best sequence to show the pathology.

MATERIALS & METHODS

STUDY POPULATION:

40 patients presenting to the Department of Radio-diagnosis for MR Fistulography were studied who satisfied the inclusion & exclusion criteria

INCLUSION CRITERIA:

All patients being referred to radiology department for MR Fistulography with:

1. History of perianal pain & discharge of pus / blood.
2. Suspected & Diagnosed perianal & anal fistulae. 3. Patient willing to participate in the study.

EXCLUSION CRITERIA:

1. Patients with metallic clips, implants
2. Patients who are claustrophobic despite reassurances.

3. Patient not giving consent.
4. Patients with sinus / normal imaging on MR Fistulography.

TECHNIQUE: MRI was performed using phased array coil & no patient preparation. A scout sagittal section was obtained through the ano rectal region, which was used for planning of the coronal, axial & sagittal views.

These sections were taken extending from perianal region to above the level of levator ani muscle.

MRI FINDING PARAMETERS:

1. Pathology seen best in sequence a. T1, T2, STIR
2. Time taken (Average) for sequences.

a. T1, T2, STIR

OBSERVATION: Distribution based on Sequences-

Table 1: Distribution according to pathology seen best on which sequence

Sequence	No. of Cases	Percentage (%)
FRFSE T2	26	65
FSE STIR	08	20
FS T2	04	10
FSE T1	02	05
Total	40	100

Table 2: Time Taken for T1 (n=37)

Time Taken (minutes)	No. of Cases	Percentage (%)
2	11	29.7
3	14	37.8
4	09	24.3
5	03	8.2
6	00	00
Total	37	100

Table 3: Mean, median & mode Time Taken for T1 (in minutes)

Mean	3.1
Median	3
Mode	3
Range	2-5 mins
Maximum	5 mins
Minimum	2mins
Sum Total	115
Count	37

Table 4: Time Taken for T2 (n=39)

Time Taken (minutes)	No. of Cases	Percentage (%)
2	04	10.2
3	17	43.5
4	14	35.9
5	02	5.2
6	02	5.2
Total	39	100

Table 5: Mean, median & mode Time Taken for T2 (in minutes)

Mean:	**4.1**
Median:	4
Mode:	4
Range:	2-6mins
Maximum:	6mins
Minimum:	2mins
Sum Total:	156
Count:	38

Table 6: Time Taken for STIR (n=38)

Time Taken (minutes)	No. of Cases	Percentage (%)
2	05	13.2
3	05	13.2
4	14	36.8
5	09	23.6
6	05	13.2
Total	38	100

Table 7: Mean, median & mode Time Taken for STIR (in minutes)

Mean:	**4.1**
Median:	4
Mode:	4
Range:	2-6mins
Maximum:	6mins
Minimum:	2mins
Sum Total:	156

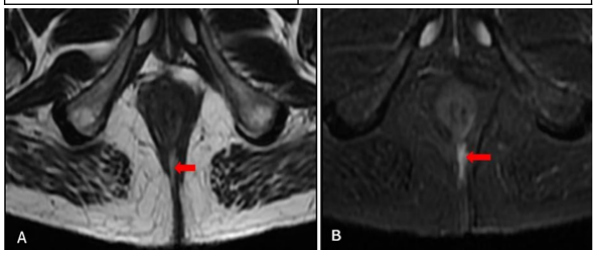

Image 1: CASE 1- 45 year old male with an Intersphincteric track 'I' shaped with external & internal openings at 6 'o' clock positions Axial FRFSE T2 (A) & STIR images(B)

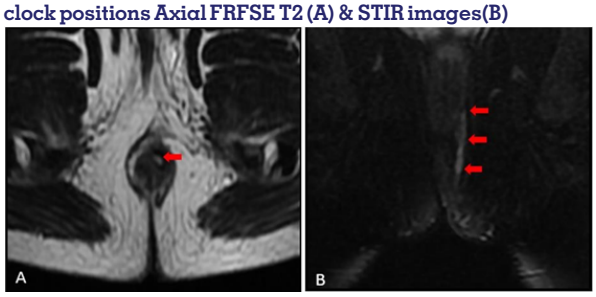

Image 2: Case 36- 55 year old male -Axial T2WI (A) & Coronal T2FS (B) images showing an 'I' shaped Intersphincteric fistulous track (Red arrows) on the left side

DISCUSSION

Imaging evaluation of perianal & anal fistula was done by MR Fistulography in patients with a positive history & clinical diagnosis. A total of 40 patients who were diagnosed during the study period were included & MRI sequences were reviewed, tabulated & analyzed for various aspects & the results were calculated for the fistula best visualized in various MR sequences and time taken for the various sequences to image fistula.

The distribution of the cases according to the sequence on which the fistula was best seen was done.

The following sequences was taken:
FRFSE T2, FSE STIR, FS T2 & FSE T1.
The count in each were 26, 8, 4 & 2.

According to the observations the fistulous track (pathology) was best seen in FRFSE T2 sequence in 26 cases (65%) followed by FSE STIR, 8 cases (20%). Axial T2 weighted fat suppressed images were the most beneficial for localizing the fistulous track.

The average time taken for T1, T2 & STIR sequences were calculated for all the cases.

- For T1 sequence the minimum time required was 2minutes (11cases- 29.7%) & the maximum time was 5 minutes (3cases- 8.2%).
  T1- Mean: 3.1, Median: 3, Mode: 3 & Range: 2-5mins.
- For T2 sequence the minimum time required was 2minutes (4cases- 10.2%) & the maximum time was 6 minutes (2 cases- 5.2%).
  Mean: 3.5, Median: 3, Mode: 3 & Range: 2-6mins.

- For STIR sequence the minimum time required was 2minutes
  (5cases- 13.2%) & maximum time was 6 minutes (5 cases- 13.2%).
  Mean: 4.1, Median: 4, Mode: 4 & Range: 2-6mins.

T1 & T2 sequences on average took 3 minutes. STIR sequence took 4 minutes which was more than both T1 & T2.The tracks were best seen on FRFSET2 sequence & T2 sequence took an average of 3mins.Therefore T2 sequence can be considered to be the best & fastest sequence for fistula evaluation.

CONCLUSION:

MR Fistulography should be used as a first-line imaging modality in the pre-operative complete evaluation of previous fistula as it reliably diagnoses and classifies anal & perianal fistula. We in our study attempted to explore the best sequence which could help evaluate the pathology and the time taken for the sequence . MR Fistulography though expensive is a one-stop imaging investigation for complete delineation of the fistulous track. If few selective sequences are performed it can reduce the time taken for the study & hence the cost. In our study, we concluded that FRFSE T2 sequences were the fastest with the best visualization of the tracks & sphincters.

REFERENCES

1. Waniczek D, Adamczyk T, Arendt J, Kluczewska E, Kozi ska-Marek E. Usefulness assessment of preoperative MRI fistulography in patients with perianal fistulas. Pol J Radiol. 2011; 76(4): 40–44
2. Dwivedi AK. Diagnosis of Fistula-in-Ano: An Innovative Approach. J Adv Res Ayur Yoga Unani Sidd Homeo. 2017; 4(1&2): 15-21
3. Shawki S, Wexner SD. Idiopathic fistula-in-ano. World J Gastroenteroly. 2011; 17(28): 3277-3285
4. Akhtar M. Fistula in Ano-An Overview. Journal of International Medical Sciences Academy. 2012; 25(1): 53-55
5. de Miguel Criado J, del Salto L, Rivas P, del Hoyo L, Velasco L, de las Vacas M et al. MR Imaging Evaluation of Perianal Fistulas: Spectrum of Imaging Features. RadioGraphics. 2012; 32 (1):175-194
6. Joshi A, Bhuta M, Kulkarni S, Singh S, Modi T. MR Imaging in Perianal Fistulas: a Comparative Study of 25 patients. World j. pharm. med. res. 2016; 2(5): 253-259
7. Alaat El Essawy MT. Magnetic Resonance Imaging in Assessment of Anorectal Fistulae and its role in management. J Gastrointest Dig Syst. 2013; 3: 3-5
8. Joshi AR, Siledar SG. Role of MRI in Ano-rectal Fistulas. Curr Radiol Rep. 2014; 2:6
9. Sudol-Szopinska I, Szczepkowski M, Panorska AK, Szopi ski T, Jakubowski W. Comparison of contrast-enhanced with non-contrast endosonography in the diagnostics of anal fistulas. Eur Radiol. 2004; 14(12): 2236-2241
10. Aggarwal R, Soni BK, Kumar JU, George RA, Sivasankar R. MR fistulography with percutaneous instillation of aqueous jelly: A cost effective technique innovation. Indian J Radiol Imaging. 2017; 27(2): 161-166
11. Gage KL, Deshmukh S, Macura KJ, Kamel IR, Zaheer A. MRI of Perianal Fistulas: Bridging the radiologic-surgical divide. Abdom Imaging. 2013; 38(5): 1033–1042