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MRI-based Evaluation of Perianal Fistulas: A Pictorial Review

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Abstract: ***Background*: Perianal fistulas are abnormal tracts that originate from the anal canal and extend to the perianal skin or surrounding tissues. They are a common cause of recurrent perianal sepsis and can significantly impact a patient's quality of life due to pain, discharge, and in some cases, fecal incontinence. Recurrence is common, especially when secondary extensions or abscesses are not detected prior to surgery. MRI has emerged as the gold standard imaging modality for evaluating perianal fistulas. It offers high-resolution multiplanar imaging and superior soft-tissue contrast, enabling precise delineation of the fistulous tract, its relationship with the anal sphincters, and any associated abscesses or secondary tracts. *Aims*: To characterize the various types of perianal fistulas in patients referred to our institution. *Conclusion*: MRI plays a pivotal role in evaluating perianal fistulas, enabling precise classification, detection of secondary tracts or abscesses, and facilitating tailored surgical planning. Adoption of the St. James classification improves diagnostic accuracy and surgical outcomes. Radiologists must be familiar with this classification and relevant pelvic anatomy to provide optimal care.***

Keywords: perianal fistula, mri fistulogram, st. james classification, sphincter complex, fistulous tract, surgical planning

1. Introduction

Perianal fistulas are abnormal tracts connecting the anal canal to the perianal skin, commonly resulting from cryptoglandular infections. They are often recurrent, cause significant patient discomfort, and may lead to complications like abscesses and fecal incontinence if inadequately treated. Accurate anatomical delineation is essential for effective surgical planning and reducing recurrence. Magnetic Resonance Imaging (MRI) is the modality of choice due to its superior soft tissue resolution and multiplanar capabilities. The St. James's University Hospital Classification provides a standardized MRI-based grading system that helps guide management by identifying the extent, complexity, and anatomical relationships of the fistulous tract.

Aims and Objectives:

- To characterize the various types of perianal fistulas in patients referred to our institution.
- To classify these fistulas using the St. James University Hospital MR classification system.
- To highlight the role of MRI in surgical planning through structured reporting and recognition of clinically relevant features.

2. Research Methodology

This cross-sectional study was conducted at the Department of Radiodiagnosis, Akash Institute of Medical Sciences and Research Centre, Akash Hospital, Bengaluru. The study included patients presenting with clinical symptoms suggestive of perianal fistula. A total of 30 cases were selected based on predefined inclusion and exclusion criteria.

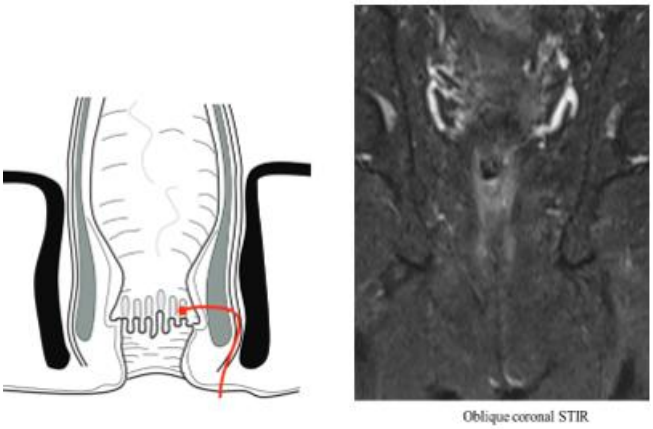
Patients with a clinical suspicion or symptoms of perianal fistula referred for MRI fistulogram were included in the study.

Patients with MRI-incompatible implants, pacemakers, or a prior history of anorectal trauma or surgery, as well as those younger than 18 years, were excluded from the study.

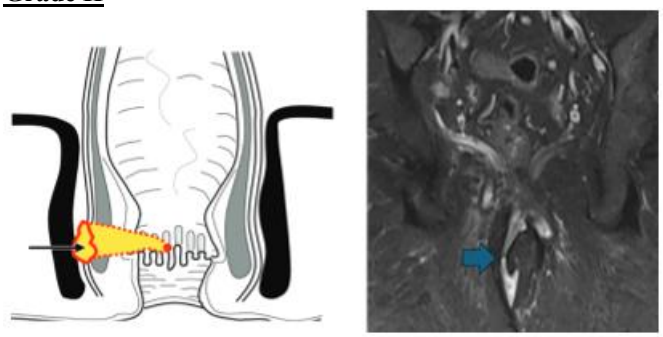
All MRI examinations were performed using a 1.5 Tesla Siemens MRI scanner. Imaging was performed with dedicated protocols for perianal region evaluation, including the following standard sequences:

- Sagittal T2-weighted images (T2WI)
- Oblique axial STIR
- Oblique coronal T2WI
- Oblique 3D T2 SPACE
- T1-weighted oblique image.
- Coronal STIR centered through the anal canal

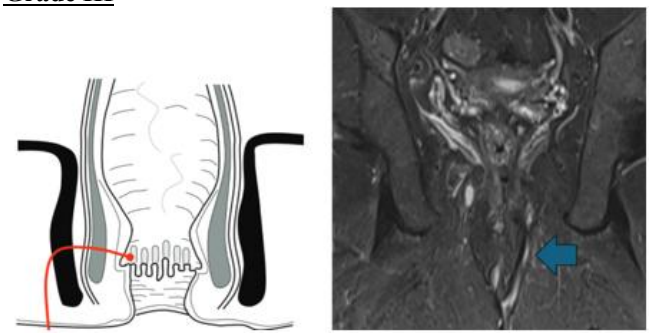
Grade I



Grade II



Grade III



Grade IV

St. James's University Hospital MR Imaging Classification of Perianal Fistulas:
Grade 1: Simple linear intersphincteric fistula
Grade 2: Intersphincteric fistula with abscess or secondary tract
Grade 3: Transsphincteric fistula
Grade 4: Transsphincteric with abscess or secondary tract in the ischiorectal fossa
Grade 5: Supralevator and translevator extension.

3. Observation and Results

Classification System Used

1) Most Common Grade: Grade II (Intersphincteric with secondary tract/abscess) – 30% of cases
2) Least Common Grade: Grade V (Supralevator involvement) – 0% of cases
3) Mean Age of Presentation: 40 years
4) Sex Predominance: Male > Female

4. Conclusion

Perianal fistulisation is a chronic inflammatory condition that frequently requires surgical intervention due to its high recurrence rate. Accurate preoperative mapping of the fistulous tract is essential to reduce recurrence and avoid complications such as fecal incontinence.

MRI, with its excellent soft-tissue contrast and multiplanar imaging capability, is the modality of choice for evaluating perianal fistulas. It enables detailed assessment of the primary tract, internal and external openings, sphincter muscle involvement, associated abscesses or secondary tracts, and the relationship of the fistula to the levator ani and other pelvic floor structures.

The use of the MRI-based St. James's University Hospital classification allows for standardized reporting and enhances communication between radiologists and surgeons. A thorough understanding of the anal sphincter anatomy and fistula subtypes is essential for radiologists to ensure accurate diagnosis, aid in surgical planning, and ultimately improve patient outcomes.

References

[1] de Miguel Criado J, del Salto LG, Rivas PF, del Hoyo LF, Velasco LG, de las Vacas MI, Marco Sanz AG, Paradela MM, Moreno EF. MR imaging evaluation of perianal fistulas: spectrum of imaging features. Radiographics. 2012 Jan;32(1):175-94.
[2] Halligan S, Stoker J. Imaging of fistula in ano. Radiology. 2006 Apr;239(1):18-33.
[3] Gage KL, Deshmukh S, Macura KJ, Kamel IR, Zaheer A. MRI of perianal fistulas: bridging the radiological–surgical divide. Abdominal imaging. 2013 Oct; 38:1033-42.
[4] Iqbal N, Tozer PJ, Fletcher J, Lightner AL, Sackitey C, Corr A, Patel U, Ilangovan R, Lung P. Getting the most out of MRI in perianal fistula: update on surgical techniques and radiological features that define surgical options. Clinical Radiology. 2021 Oct 1;76(10):784-e17.
[5] Adam A, Dixon AK, Gillard JH, Schaefer-Prokop C. Grainger & Allison's Diagnostic Radiology, 2 Volume Set E-Book. Elsevier Health Sciences; 2020 May 25.
[6] Öz DK, Zorlu SN, Eskalen Z, Ateş FS, Akyol C, Erden A, Geçim İE. Goodsall's Rule Revisited: An MRI-Based Assessment of its Accuracy in Perianal Fistulas. EDITORIAL BOARD. 2025 Jun 1;35(2):41-7.
[7] Abdulrahman SM. The Role of Magnetic Resonance Imaging in Preoperative Evaluation of Perianal Fistulas: A Cross-Sectional Study on Diagnostic Accuracy,

Classification, and Surgical Implications. Journal of Patient Safety & Quality Improvement. 2025 Apr 1;13(2):113-20.

[8] Inggriani S, Rahmawati DL, Octavius GS. A systematic review and meta-analysis of the diagnostic test accuracy of diffusion weighted imaging and apparent diffusion coefficient in differentiating active from inactive perianal fistula. Radiography. 2025 Mar 1;31(2):102884.

[9] Hussein AA, Abdelghaffar W, Shalaby MM, El-Sayed NT. Added Value of Diffusion Weighted Imaging in Evaluation of Perianal Fistula in comparison with conventional MRI Fistulogram. Egyptian Journal of Hospital Medicine. 2024;97(1):4293-301.

[10] Patil Y. Magnetic Resonance Imaging for Perianal Fistulizing Disease: Evaluation Methods and Anatomical Insights. IJLRP-International Journal of Leading Research Publication.;5(6).