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Magnetic Resonance Imaging - Anatomical Mapping and Classification of Perianal Fistulas before Surgery

Major Haribaskar Subbukrishnan[1], Smita Borale[2]

[1]Associate Professor, Department of Radiodiagnosis, BGS Global Institute of Medical Sciences, Bengaluru.
[2]Consultant Teleradiologist at 5C Network (India) Private Limited, Bengaluru.

Corresponding Author: Smita Borale

ABSTRACT

Perianal fistula is an annoyingly painful relatively common disease which is surgically curable. However, over-ambitious and injudicious surgery may convert this malady into a disaster for the patient. To diminish the postoperative incidence of recurrence rate and fecal incontinence, the operator must understand the exact anatomical relationship of the fistula with the perianal structures and spaces. MR imaging depicts infected tracts and remote foci of infection clearly than any other method including surgical exploration. Detailed MRI evaluation of perianal fistula provides complete pre-treatment route map to the surgical team and thereby enabling them treat it successfully. We would be describing the plethora of imaging findings that we came across our patients in this case series using MRI. Magnetic resonance imaging is non-invasive imaging method which is devoid of any radiation exposure. Hence it's the imaging modality of choice particularly for the younger age group that present with disease most commonly.

Keywords: Perianal fistula, Fistula in ano, Magnetic resonance imaging, Tract, sinus, Abscess.

INTRODUCTION

Fistula is defined as a chronic granulating track connecting the two epithelium lined surfaces which could be between cutaneous or mucosal surface. Sinus is a blind ending tract from an epithelial surface without any internal opening. Perianal fistulas run from perianal skin or perineum into the anal canal. They cause considerable discomfort and morbidity to the patients.

Despite seemingly adequate surgery, fistulas often recur, due to the omitted infectious focus during surgery. Until the recent past, classifications of perianal fistulas were mainly clinical, based on the techniques of inspection, digital examination, probing and fistulography. The methods to delineate the location of the internal opening and the exact anatomy of the track by examination methods alone were really hard, agonizing and potentially hazardous to the patients.

MRI imaging plays vital role in preoperative identification and planning not only the infected tract but also help in identifying abscesses that otherwise would have been missed or undetected and untreated at the time of examination under general anesthesia.

MATERIALS AND METHODS

After clinical examination, patients were referred for MRI imaging of perianal fistula. The following points were evaluated in detail after MR imaging: Site of external opening, primary track, secondary ramifications and evidence of abscess if any, position of internal opening and complex supralevator extensions.

TECHNIQUE

MR Imaging of fistula was performed using SIEMENS MAGNETOM 1.5 Tesla Scanner with body coil. Multiplanar T2WSE sequences with and

without fat saturation and T1WSE sequences without fat saturation were obtained.

In this series of 22 patients, we would be emphasizing about the accuracy of the Magnetic resonance imagining in evaluation perianal fistulas clearly before surgery.

OBSERVATIONS

We would be presenting our observations and results. We aim mainly to elicit our findings and representative images that will lead to easy understanding and accurate image interpretation. We would also be explaining pathogenesis and the Magnetic resonance imaging classification and describe them in brief.

Results: 12 males (55%) and 10 females (45%) were included in our study. Age range was 17 - 65 years and mean age being 41 years.

Table 1: Age wise demographics of the cases given below in the table 1.

Age group in years	No of cases
20 and below	1
21 - 30	4
31 - 40	4
41 - 50	9
51 - 60	3
61 and above	1

MRI clearly demonstrated fistula in 20 patients and 2 cases were diagnosed as sinus.

External opening was visible with MRI and in case of ambiguity; the site was marked with vitamin E capsule (Evion 400) for identification after clinical examination.

Primary track was easily identified by the T2 hyperintense linear signal. Secondary tracks and abscesses were identified in 7 patients.

Table 2: Case distribution according to MRI grading is given below in the table 2.

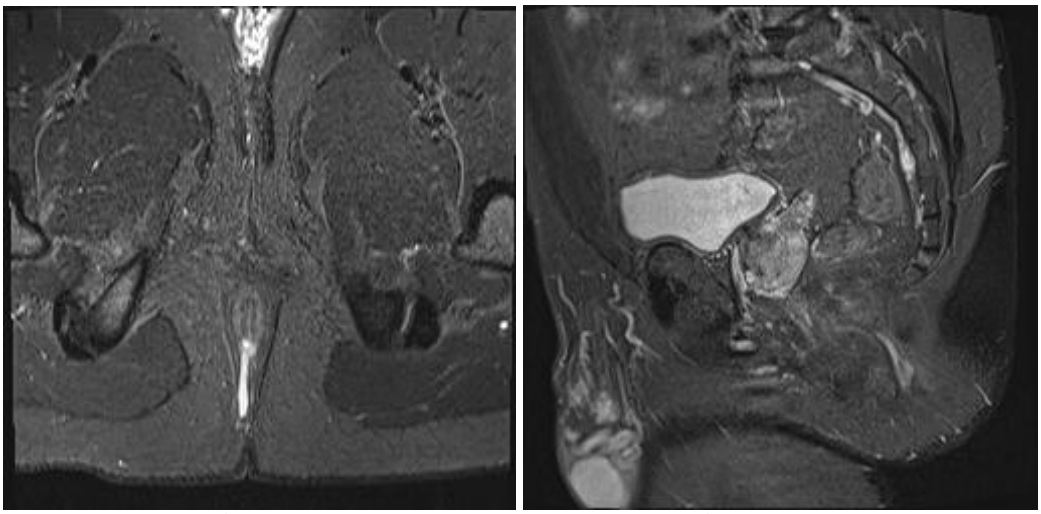
Grade of fistula	No of cases
Grade 1 fistula	9 cases
Grade 2 fistula	3 cases
Grade 3 fistula	4 cases
Grade 4 fistula	3 cases
Grade 5 fistula	1 case

In the Grade 5 fistula case, no source of pelvic sepsis identified.

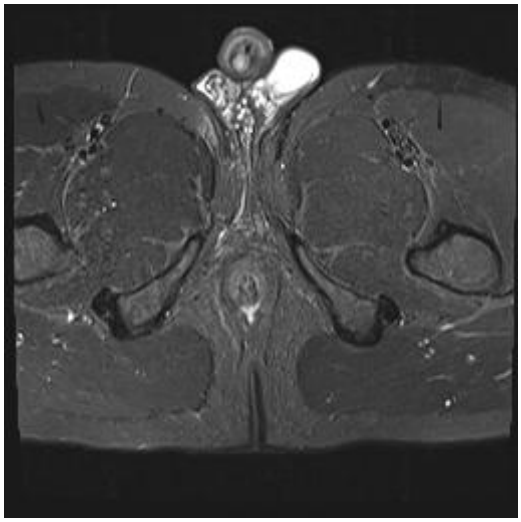
One case was identified as blind ending sinus in the perineal region and the other case was identified as pilonidal sinus superiorly in the intergluteal cleft region.

3 cases showed T1 and T2 hypointense signal in the tracks representing chronic nature of the fistula and we did not evaluate this post IV contrast enhancement as the treatment does not differ for both. Rest of the cases showed T2 hyperintense tracks which implied active disease.

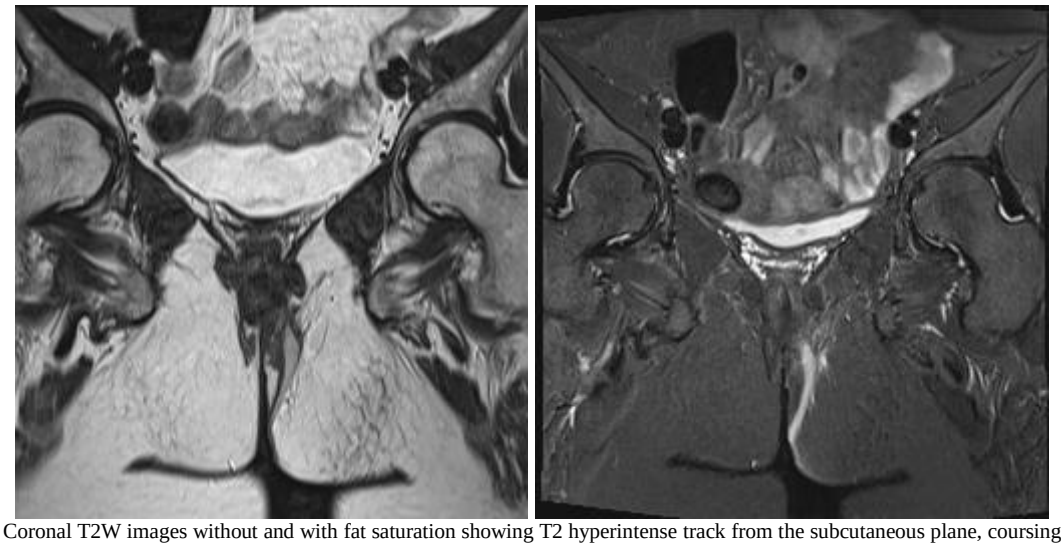
Most cases showed position of the internal mucosal opening on axial images, posteriorly around 6 o’clock in 13 cases and anteriorly around 12 o'clock in 5 cases. 2 other cases respectively showed at 8 o’clock and 1 o’clock of the anal clock face.



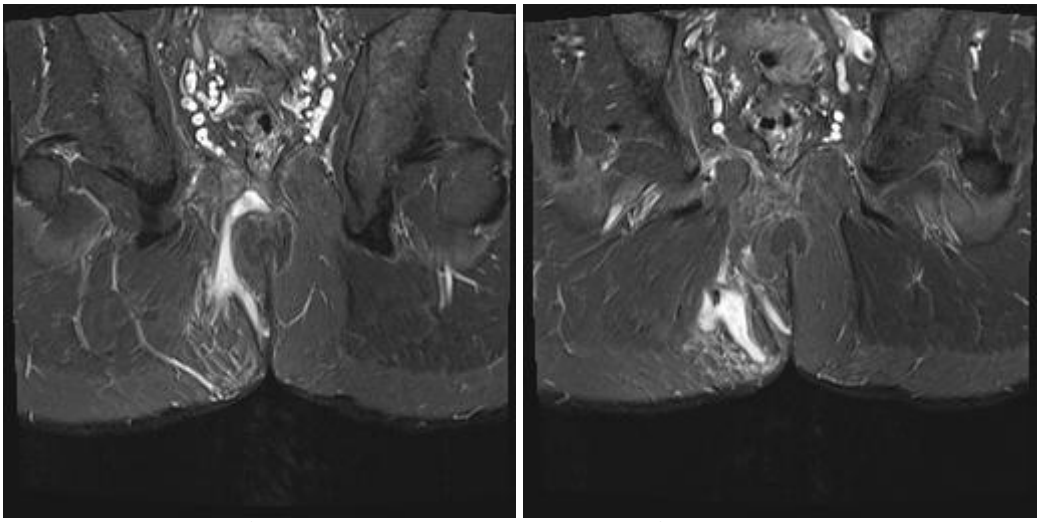
Case 1: Axial and sagittal T2W fat saturation images showing T2 hyperintense track from the subcutaneous plane, traversing in the intersphincteric plane opening internally at 6 o’ clock at the dentate line without any ramifications – Grade 1 simple intersphincteric fistula.



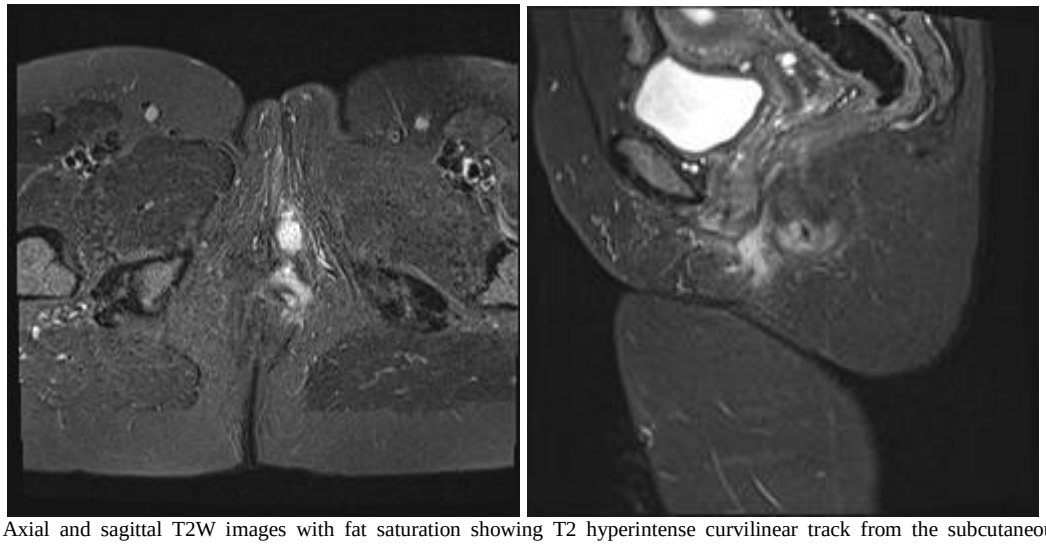
Case 2: Axial T2W fat saturation image showing T2 hyperintense track extending in the intersphincteric plane and forming horseshoe abscess posteriorly between 5 and 7 o' clock and confined within the intersphincteric plane – Grade 2 Intersphincteric Fistula with horseshoe abscess.



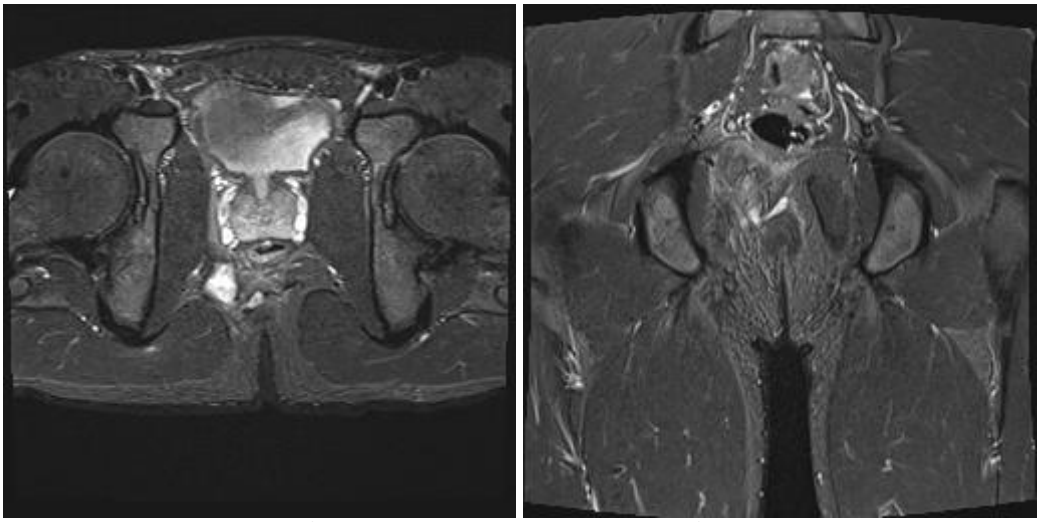
Case 3: Coronal T2W images without and with fat saturation showing T2 hyperintense track from the subcutaneous plane, coursing through the external sphincter without any ramifications – Grade 3 Trans-sphincteric Fistula.



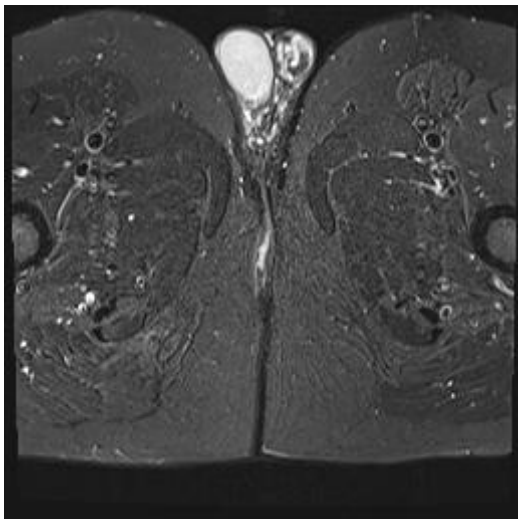
Case 4: Coronal T2W images with fat saturation showing T2 hyperintense track from the subcutaneous plane, traversing through the external sphincter associated with large right ischioanal fossa abscess and inflammation inferiorly – Grade 4 Trans-sphincteric Fistula associated with right ischioanal fossa abscess and inflammation.



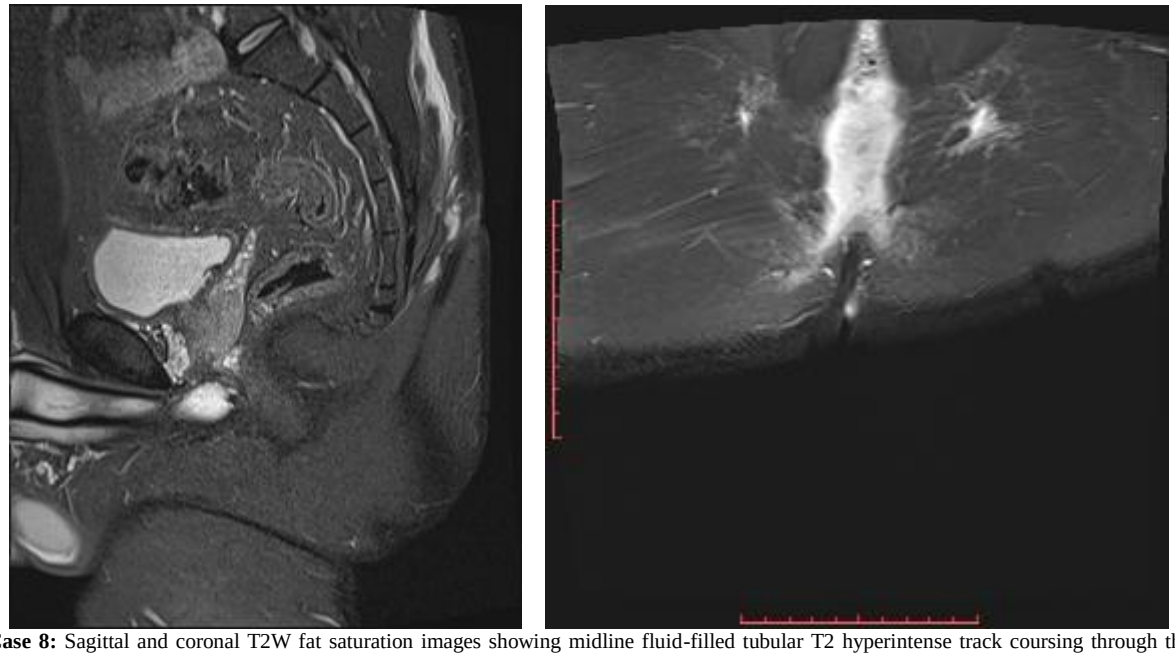
Case 5: Axial and sagittal T2W images with fat saturation showing T2 hyperintense curvilinear track from the subcutaneous plane, traversing through the external sphincter at 1 o' clock anteriorly associated with large left perineal abscess and inflammation superiorly – Grade 4 Trans-sphincteric Fistula associated with left perineal abscess and inflammation.



Case 6: Axial and coronal T2W images with fat saturation showing T2 hyperintense track from the subcutaneous plane, traversing above the external sphincter through the levator muscle at 8 o' clock position associated with large right ischiorectal fossa abscess and inflammation superiorly. No breaches of the levator plate or septic pelvic foci identified – Grade 5 Suprasphincteric fistula associated with right ischiorectal fossa abscess and inflammation.



Case 7: Axial T2W fat saturation image showing a blind ending T2 hyperintense track in the subcutaneous plane of perineum anteriorly without any ramification or extension in to the anal canal. – Blind ending perineal sinus.



Case 8: Sagittal and coronal T2W fat saturation images showing midline fluid-filled tubular T2 hyperintense track coursing through the subcutaneous sacrococcygeal region, from the wider retrosacral external opening at the superior intergluteal cleft. Fat suppression also reveals edematous inflammatory changes of the surrounding subcutaneous fat - Sacrococcygeal pilonidal sinus.

DISCUSSION

The anal glands are distributed in the subepithelial region, internal sphincter and up to approximately two-thirds of glands are deeply sited within the intersphincteric space. [(1)]

It is believed that these intersphincteric glands once infected would initiate the event in fistula in ano and known as the "Cryptoglandular

Hypothesis". [(2)] Acute perianal glandular infection leads to the evolution of anorectal abscess and the chronic infection leads to the development of fistulation. [(3)] There are more lymphoid tissue aggregates surrounding the anal glands, which might explain the increased incidence of perianal pathology in Crohn disease. [(4)]

This disease has prevalence of approximately 1 in 10000 individuals and predominantly affects young adults. Fistula in ano is most common in males with sex ratio of approximately 2:1. [(6)] Similar results were obtained in our study.

Most common presenting symptom would be with discharge. Perianal pain attributed to inflammation is the next common symptom. Rarely, may be totally asymptomatic. [(7)]

Till the recent past, imaging had a very little role in the assessment of perianal fistulas. Magnetic resonance imaging (MRI) has been shown to accurately depict the anatomy of the perianal region. Besides demonstrating the anal sphincter very well, it also clearly shows the relationship of fistula to the levator plate and the ischioanal fossa. This relationship is vital in surgical management and outcome. [(5, 8, 9,10)]

Fistulas are classified into five MRI – based grades according to the **St James's University Hospital classification**. [(8)]

If the ischioanal/rectal fossae are unaffected, and disease is confined only to the sphincter complex (Simple intersphincteric fistula, grade 1).Any horseshoe collection, secondary track or abscess associated with this (intersphincteric fistula with secondary track or abscess, grade 2) and there is favorable outcome following surgical management for these types. [(9,10)]

Simple fistulation through the external sphincter mechanism without any horseshoe collection, secondary track or abscess affecting ischioanal fossae (Simple trans-sphincteric fistula, grade 3). If the ischioanal fossa is affected by a fistula or abscess, this indicates complex trans-

sphincteric disease, (trans-sphincteric with abscess or secondary tract, grade 4). For these types, more meticulous composite surgical procedures might be required that may endanger fecal continence or even require colostomy to enable healing. [9, 10,12]

If the track extends above the sphincter complex or the levator muscle plate, (suprasphincteric or translevator fistula, grade 5) it's a complex disease and presence of pelvic septic focus should be actively sought. [5, 8]

MR image-guided surgery helps reduce postoperative recurrence by 75% in patients with complex disease. [5] MR imaging provided important additional information in these patients. [11,12] Anal endosonography is a definite alternative when MR is not available, but uncomfortable for the patient already in pain. [13]

CONCLUSION

MRI is an excellent examination for perianal fistulas. It showed each and every aspect of perianal fistula which could be essential for excellent surgical management. MRI is a non-invasive procedure, convenient for the patient and devoid of radiation exposure to the patient. Hence it's the imaging modality of choice in the relatively younger patients presenting most commonly.

BIBLIOGRAPHY

1. McColl I. The comparative anatomy and pathology of anal glands. Ann R Coll Surg Engl 1967; 40:36–67.
2. Parks AG. Pathogenesis and treatment of fistula-in-ano. Br Med J 1961; 5224:463–469.
3. Parks AG, Gordon PH, Hardcastle JD. A classification of fistula-in-ano. Br J Surg 1976; 63:1–12.
4. Langman JM, Rowland R. Density of lymphoid follicles in the rectum and at the anorectal junction. J Clin Gastroenterol 1992;14: 81–84.
5. Steve Halligan, MD, FRCP, FRCR Jaap Stoker, MD, PhD Imaging of Fistula in Ano, Radiology 2006; 239:18–33
6. Sainio P. Fistula-in-ano in a defined population. Incidence and epidemiological aspects. Ann Chir Gynaecol 1984;73: 219–224.
7. Practice parameters for treatment of fistula-in-ano: supporting documentation. The Standards Practice Task Force. The American Society of Colon and Rectal Surgeons. Dis colon Rectum 1996; 39:1363–1372.
8. John Morris, FRCR • John A. Spencer, MD, FRCR • N. Simon Ambrose, MS, FRCS MR Imaging Classification of Perianal Fistulas and Its Implications for Patient Management, RadioGraphics 2000; 20:623–635
9. Spencer JA, Chapple K, Wilson D, Ward J, Windsor ACJ, Ambrose NS. Outcome after surgery for perianal fistula: predictive value of MR imaging. AJR Am J Roentgenol 1998; 171:403–406.
10. Barker PG, Lunniss PJ, Armstrong P, Reznek RH, Cottam K, Phillips RK. Magnetic resonance imaging of fistula-in-ano: technique, interpretation, and accuracy. Clin Radiol 1994; 49:7–13.
11. Myhr GE, Myrvold HE, Nilsen G, Thoresen JE, Rinck PA. Perianal fistulas: use of MR imaging for diagnosis. Radiology 1994; 191:545–549.
12. Buchanan GN, Halligan S, Williams AB, et al. Magnetic resonance imaging for primary fistula in ano. Br J Surg 2003; 90:877–881.
13. Buchanan GN, Halligan S, Bartram CI, Williams AB, Tarroni D, Cohen CRG. Clinical examination, endosonography, and MR imaging in preoperative assessment of fistula in ano: comparison with outcome-based reference standard. Radiology 2004; 233(3):674–681.

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