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ANO -RECTAL FISTUAL - EVALUATION WITH MRI

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ABSTRACT

Aim: The study was done to assess the diagnostic accuracy of MRI in suspected or established case of ano-rectal fistula.This study is based on twenty five patients with a clinical diagnosis of ano-rectal fistula. The MRI findings were correlated with surgical findings.

Conclusion: MRI is the choice of investigation in cases of ano-rectal fistula because of it's ability to accurately demonstrate the pelvic anatomy, disease extension & the prognosis of surgical treatment. MRI provides an overview of the perianal fistula & its various types.

KEYWORDS : Ano-rectal fistula, Intersphincteric, MRI, Transsphincteric

Introduction

A fistula is defined as a pathological tract connecting two hollow organs,or one hollow organ & the skin.Anal fistula is somewhat uncommon condition but seen more commonly in male population with a male female ratio of 1: 2-4.Men are more commonly involved because of higher abundance of anal glands.The fistula occurs mainly because of anal obstruction,with secondary abscess formation and external ruputure of the abscess.[1]

They have traditionally seen with conventional fistulograms; the procedure involves cannulation of the external opening and injection of water soulble contrast.If the tract is filled with pus or debris,the tract will not be opacified.Further on x-ray imaging it is not possible to identify the sphincteric anatomy.hence the relation between fistulous tract and the internal / external sphincter and the levator ani can not be evaluated.[2]

Trans rectal sonography also depicts fistula and their relation to the anal sphincter muscles.However it is operator dependent and also provides limited field of view.[2]

MRI helps not only to accurately demonstrate disease extension but also to predict prognosis,make therapy decisions and monitor therapy. Missed extensions at surgery are usually the cause of recurrence. MRI is helpful in reducing the recurrence and subsequentially the reoperation.

Types of fistula [3]
Low fistula: when the primary opening is below the anorectal ring.
High fistula: when the internal opening is above the anorectal ring.

Clinical importance of high & low fistula is that high fistula is at risk of post operative fecal incontnence due to sphincter damage than low variety. High fistulas have their internal opening above the anorectal ring which is chifely responsible for anal continence. During surgery for high fistula the anorectal ring may get damaged and lead to fecal incontinence.

Classification of fistula[3]:
There are three types of fistula classification.
(1):Standard classification
(2):Radiological classification
(2) Park's classification

Standard classification:
(1)Subcutaneous fistula
(2):Submucous fistula
(3):Low anal fistula
(4): High anal fistula

Radiological classification:
Radiologists have develpoed another grading system for perianal fistulae which is based on landmarks on axial plane & incorporates abscesses and seconadry extensions to the grading system,is called St.James's University Hospital classification:
Grade 0: normal appearance
Grade 1: Simple linear intersphincteric fistula
Grade 2: intersphincteric fistula with abscesses or secondary track
Grade 3: transsphincteric fistula
Grade 4: transsphincteric fistula with abscesses or secondary tract within the ischio-rectal fossa.
Grade 5: supralavator and translevator extension.
Grade 1 & 2 have good surgical prognosis. Grade 3 to 5 has poor surgical prognosis.

Park's classification
(1)intersphincteric fistula: This is the most common type(60-70%) and runs between the internal & external sphincter.

(2)Transsphincteric fistula(20-30%): Extends through both internal and external sphincter.

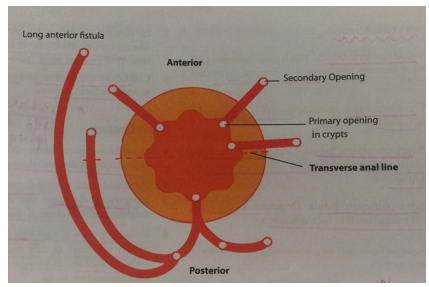
(3):suprasphincteric fistula(uncommon): Originates in the intersphincteric plane and track up & around the entire external sphincter.

(4):Extrasphincteric fistula(uncommon): Originates in the rectal wall and tracks lateral to both sphincters.

Salmon-Goodsalls law[4] is used to determine the location of internal opening i:e opening inside anal anal or rectum.According to this rule fistula with external opening anterior to horizontal imaginary line drawn across the mid point of anus is connected to internal opening by short straight tract.

Fistulas with external opening posterior to the horizontal line run a curvilinear course and open internally into the posterior midline. However exception to this rule often occurs.

Figure (1): Salmon- Goodsell 's law.[4]



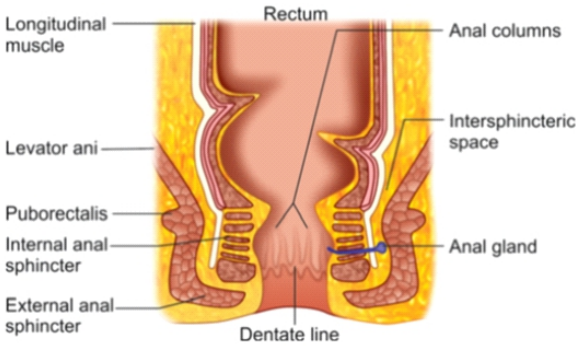
Anatomy of the anal canal[5]:

Surgeons describe the site & direction of the fistulous tracks be refering to anal clock.Lithotomy position is usually used for the surgical treatment.At 12 o'clock position lies the anterior perineum and at 6 0'clock,the natal cleft.3 o'clock refers to left lateral aspect,

and 9 o'clock, to the right of anal canal.These descriptions corrosponds with axial image of coronal image.These description on MR image helps surgeons proper surgical planning.

Proper anatomy and function of anal sphincters and knowledge of probable cause of fistula helps the radiologist as well as surgeon in surgical planning. The internal sphincter is involuntary and is composed of smooth muscles continous with the circular smooth muscles of the rectum. It is responsible for 85% resting anal tone,In most individuals, it can be divided without causing loss of continece. The external sphincter is composed of striated muscle and is continuous superiorly with the puborectalis and levator ani muscles. It contributes only 15% resting anal tone,but its strong voluntary contractions resist defecation.A division of the external sphincter can lead to incontinence.

Figure 2: Ano-rectal anatomy[5].



Material and Methods

A total of twenty patients were referred to our tertiary care providing hospital in Ahmedabad,Gujarat from Nov-2016 to July. 2017. Patient's Serum creatinine was checked before the procedure as intraveneous contrast was given to highlight the fistula & to the sorrounding structures.Procedure was approved by the Review board of our Institute.Written concent was taken before the scan.In ideal case minimum four hour nil by mouth was advised to the patients.

All MRI studies were carried out on a 1.5 T MRI system(GE signa Explorerer) using an 16 channel phased array coil.The sequences taken were Axial T1WI and T2WI, Axial STIR,Coronal STIR,Coronal T1WI, sagital fat suppressed T2WI,Axial,coronal,sagital fat suppressed post contrast T1WI (post injection of 5-7 cc of Gadolinium).

Result:

Twenty patients were included in the study out of which 14 patients were male & six patients were female with majority of patients were in 4th & 5th decade.MRI findings was as described in Table 2.One patient was having a residual fistulous tract on subsequent follow-up MRI. Four patients were having associated abscesses.The MRI findings were coorelated with surgical findings.

Table 1

Male/ female ratio	Total no of patients(20)
Male	14(70%)
Female	6(30%).

Table 2

Type of fistula	No of patients(%)
Transsphincteric	14(70%)
Intersphincteric	6(30%)
Extrasphincteric	0(0%)

Discussion:

MRI is more effective in outlining the fistulous tract.In one of the study done by Lunniss et al on MRI fisulography was effective upto 86-88% bteween findings on MRI & surgical findings.[6].In the present study the effectiveness of MRI & surgical findings was 90%. Missed extensions are the most common cause of recurrence.[7]. MRI detect fistulous extent with good localization in relation to surgically constant anatomical landmarks,especially in coronal sequences. The most important landmark for the surgeon is internal opening location which is described in clock position in relation to external sphincter, course of the tract in relation to sphincters and levator ani muscles. Preoperative characterization of the anatomical couse of the fistula and associated infection is crucial[8].MRI is helpful in limiting the recurrence and/or incontinence after the surgery.MR imaging will definitely improve the surgical outcome in high grade fistula[9].Recurrent fistulas, complex fistulas are often difficult to evalauate at surgery because of the extensive secondary extensions and multiple perianal and perirectal abscess formation. When not identified properly and not treated properly these extensions and abscesses may lead to recurrences.[10].

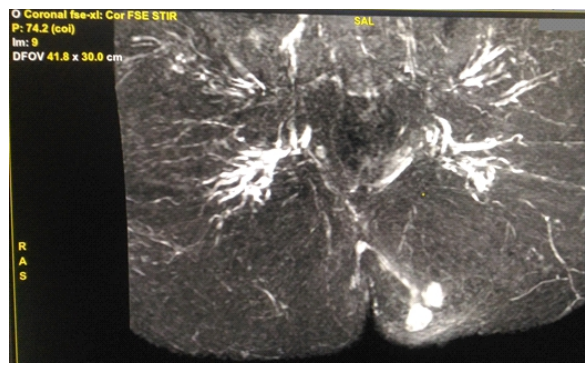
Conclusion:

Perianal fistulae is a clinical entity with significant patient morbidity. While multiple surgical options exist, recurrence rate and the risk of fecal incontinence are important consideration in management strategy. MRI provides information about the fistulae with greater anatomic detail with respect to secondary tracts and absecceses as well as surrounding pelvic organs. The use of MRI for the identification and classification of anorectal fistulae can provide essential information that has been shown to have both preoperative and prognostic value. Preoperative MRI helps in identification of hidden infection, secondary extensions and abscess formation and reduces the chance of recurrence.

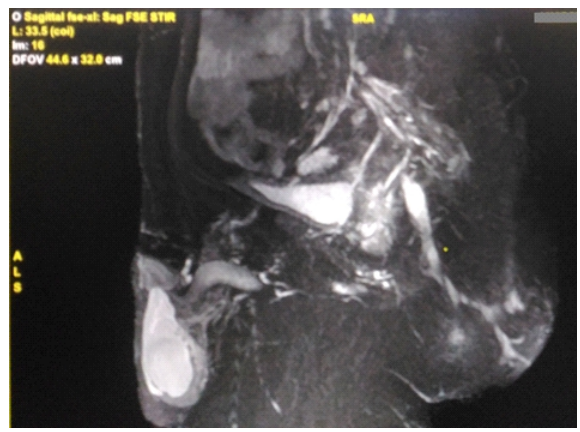
Thus MRI is very much recommended in the preoperative assessment of peri anal fistula.

Images:

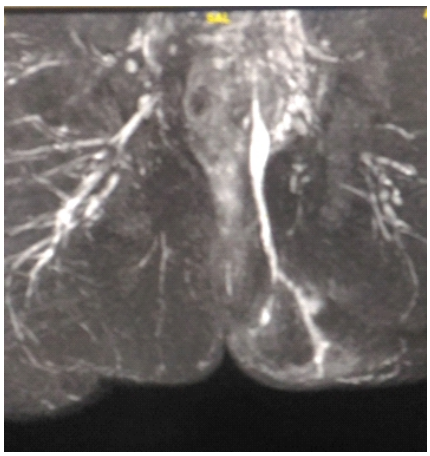
1 Coronal STIR image showing intersphincteric fistula at 5 o'clock position with presence of abscess cavities.



2a & 2b Sagital STIR & Axial STIR image showing transsphincteric fistula at 5-6 o' clock position with side extensions.

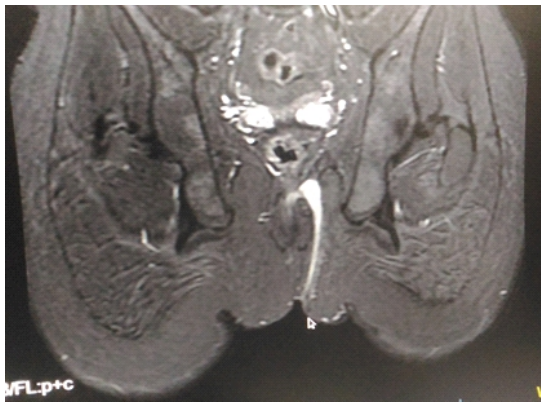


Sagital STIR & Axial STIR image showing transsphincteric fistula at 5-6 o' clock position with side extensions.

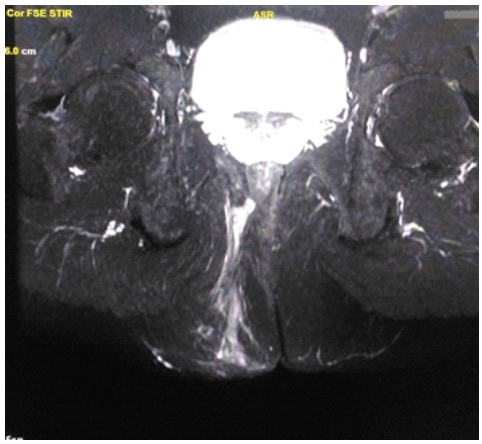


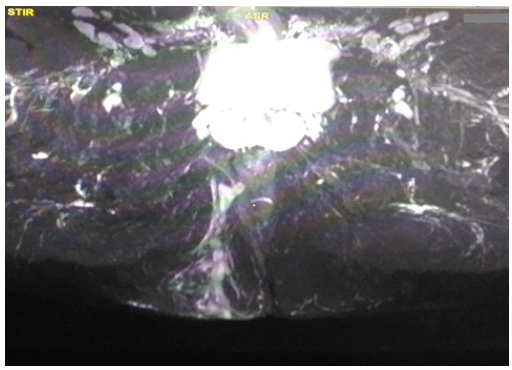
3; sagital T2WI showing transsphincteric fistula.

4:Axial STIR image showing transsphincteric fistula at 5-6 o'clock position.

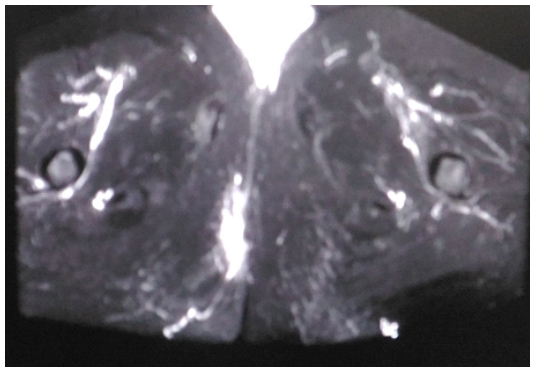


5(a) & (b) Axial & coronal STIR image showing transsphincteric fistula at 6-7 o'clock position.





6: Axial STIR image showing intersphincteric fistula at 7 o'clock position.



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