ORIGINAL ARTICLE

PRE-OPERATIVE MRI EVALUATION OF FISTULA IN ANO

Shaista Shoukat, Kausar Illahi Bux, Humera Nisar, Tariq Mahmood

Department of Radiology, Jinnah Post Graduate Medical Centre (JPMC), Karachi, Pakistan

PJR July - September 2016; 26(3): 198-201

ABSTRACT

A fistula is defined as a pathologic tract connecting two hollow organs, or one hollow organ and the skin. Fistula in Ano is a benign condition but may cause considerable distress to the patient and difficulty for surgeons. Fistula in Ano effects approximately ten individuals in 100,000, with male predominance, higher abundance of anal glands is thought to be the partial reason. The infected gland leads to fistula formation after some time, which starts as an abscess. There are, of course, other causes including chronic ulcerative colitis, Crohn's disease, tuberculosis, carcinoma of the rectum or anal canal, benign rectal strictures, foreign bodies or diverticulitis. **OBJECTIVE:** To determine the sensitivity of MRI in pre-operative evaluation of fistula in Ano. **STUDY DESIGN:** Cross-sectional. **SETTING:** Radiology department Jinnah Post Graduate Medical Center, Karachi. **SUBJECTS AND METHODS:** A total of 30 patients from Radiology department with symptomatic fistula in ano referred for MRI pelvis and were meeting inclusion criteria were included in the study conducted during four months period (from 25th August to 20th December 2013). Informed consent was taken for MRI pelvis. The MRI pelvis was performed on 1.5 Tesla scanner the findings were confirmed by consultant radiologist having >5 years of post-fellowship experience. The data were entered and analysed in to SPSS (version 21). Descriptive statistics were calculated for the characteristics of age of the patients. **RESUTLS:** Out of 30 patients, 24 (80 %) cases had inter sphincteric primary tract and 6 (20%) patients had trans sphinteric primary tract. Primary tracts were correctly identified in all patients, in 25 out of 30 patients internal opening were identified while remaining 5 patients showed diffuse trans mural signal abnormality and in 27 patients (80%) external opening were correctly identified. 18(60%) had low fistula in Ano, 8 (26%) had high anal fistula and in 2 (6%) patients low rectal fistula was identified. 2 patients had complex fistula. **CONCLUSION:** MRI was well correlated with the post-surgical findings regarding the primary tract, extension and their relationship with anal sphincter complex.

Introduction

A fistula is defined as a pathologic tract connecting two hollow organs, or one hollow organ and the skin. Fistula in Ano is a benign condition but may cause considerable distress to the patient and difficulty for surgeons. Fistula in Ano effects approximately ten individuals in 100,000, with male predominance, higher abundance of anal glands is thought to be the partial reason. The infected gland leads to fistula formation after some time, which starts as an abscess. There are, of course, other causes including chronic ulcerative colitis, Crohn's disease, tuberculosis, carcinoma of the rectum or anal canal, benign rectal strictures, foreign bodies or diverticulitis.

Parks at el explicate the primary tracts as following four patterns. The most common group is the inter-sphincteric type, where the primary track reaches the perianal skin through the intersphincteric plane. The next common type, or trans-sphincteric type, occurs when the track courses through the external sphincter muscle, usually involving the ischioanal fossa. In the suprasphincteric fistula, in contrast to intersphincteric fistula, courses initially upward above the sphincter muscles, and then coursing down to the perianal skin. The fourth type or extrasphincteric, shows no communi-

Correspondence : Dr. Shaista Shoukat
Department of Radiology,
Jinnah Post Graduate Medical Centre (JPMC),
Karachi, Pakistan
Email: shaistadr@hotmail.com

Submitted 25 December 2015, Accepted 28 January 2016

cation with the anal canal and it does not involve intersphicteric plane.
Fistula is intimately related to the anal sphincter complex so that incision and drainage may damage these structures to a degree with risk of fecal incontinence. The role of imaging is very important to outline all hidden tracts and define the relationship of the fistula to the anal sphincter so the unintentional damage to the anal sphincter which can lead to anal incontinence can be easily avoided; hence the knowledge of the relations between the fistulous tract and the anal sphincter is very essential for proper surgical approach.
The correct balance between eradication of infection and maintenance of continence depends upon accurate preoperative assessment with fistulography, namely the site and level of any internal opening, the anatomy of primary tract and secondary ramification.

Objective

To determine the sensitivity of MRI in pre-operative evaluation of fistula in Ano.

Study Design
Cross-sectional.

Setting
Radiology department Jinnah Post Graduate Medical Center, Karachi.

Subjects and Methods

A total of 30 patients from Radiology department with symptomatic fistula in ano referred for MRI pelvis and were meeting inclusion criteria were included in the study conducted during four months period (from 25th August to 20th December 2013).
Informed consent was taken for MRI pelvis. The MRI pelvis was performed (Fig. 1) on 1.5 Tesla scanner the findings were confirmed by consultant radiologist having >5 years of post-fellowship experience. The data were entered and analysed in to SPSS (version 21). Descriptive statistics were calculated for the characteristics of age of the patients.

Inclusion Criteria:
Thirty patients age ranged from 20 - 40 years with complains of pussy rectal discharge.

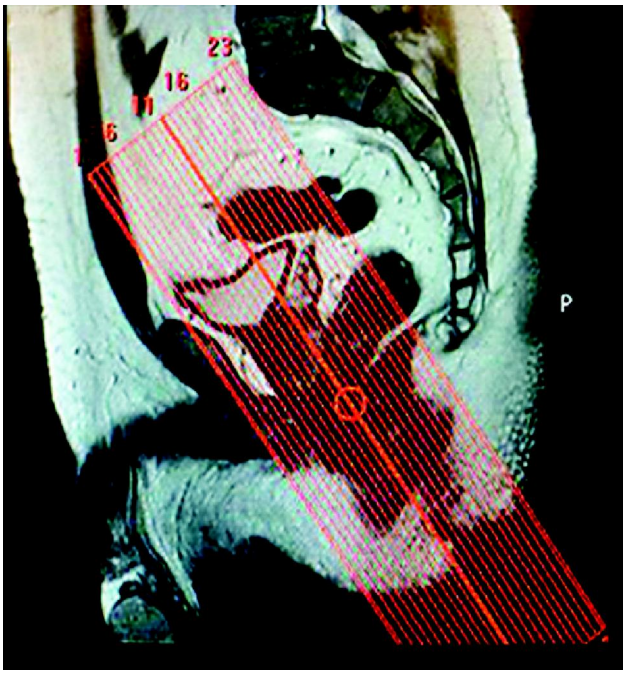

Figure 1: MRI planning for Fistula in Ano.

Sequence and plane	TR/TE	Section Thickness / intersection gap (millimeter)	FOV (millimeter)
T2w fast spin echo without fat suppression (sagittal, coronal and transverse)	4000/ 90	3/0.3	300
T2w fast spin echo with fat suppression (transverse)	3500/ 90	3/0.3	300
T1w fast spin echo with fat suppression (transverse)	640/ 15	4/0.4	300

Table 1: Imaging Protocol; MRI sequences;

Exclusion Criteria:
Post-operative case.

Results

Out of 30 patients, 24 (80 %) cases had inter sphincteric primary tract, (Fig. 2) and 6 (20%) patients had trans sphinteric (Fig. 3 and 4) primary tract. Primary tracts were correctly identified in all patients, in 25 out of 30 patients internal opening were identified while remaining 5 patients showed diffuse trans mural signal abnormality and in 27 patients (80%) external opening were correctly identified. 18(60%) had low fistula in Ano, 8 (26%) had high anal fistula and in 2 (6%) patients low rectal fistula was identified. 2 patients had complex fistula.

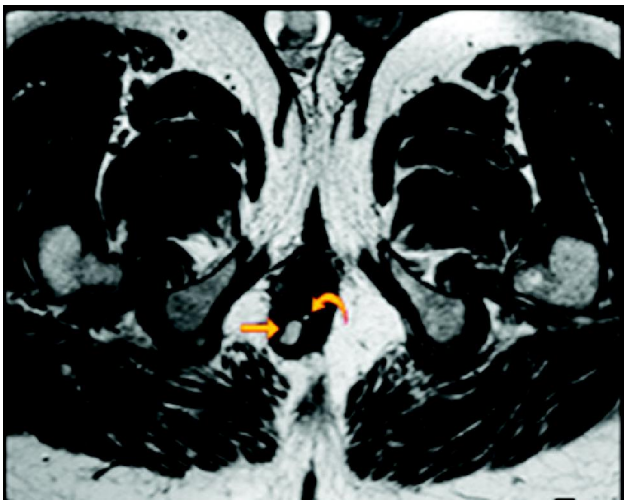

Figure 2: Axial T2W intersphincteric tract (arrow) demonstrating internal opening at 6'o clock position. (curved arrow)

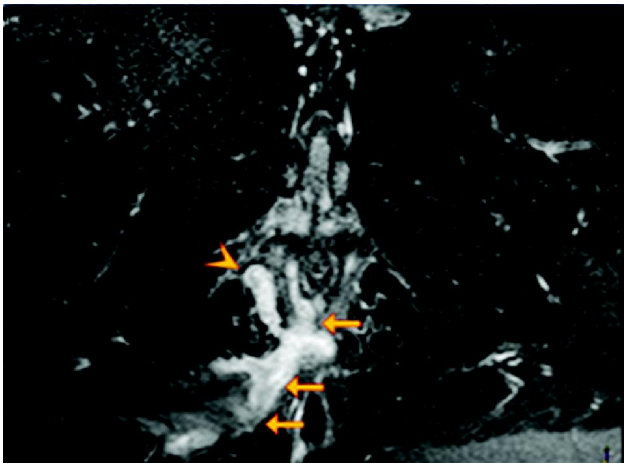

Figure 3: Axial STIR T2W image shows primary transsphincteric tract at 7'o clock position. (arrow) demonstrating extra sphincteric as well as inter sphincteric route, crossing mid line in horseshoe pattern. (arrow head)

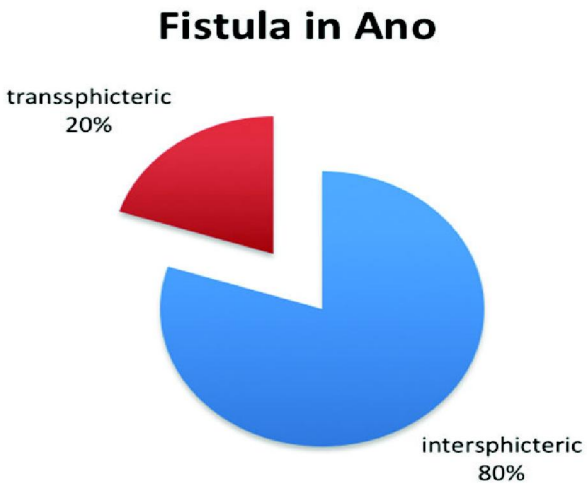

Figure 4: Pie chart of results.

Discussion

Fistula-in-ano is one of the commonly faced surgical problems with prevalence of 1.2 to 2.8/10,000.[1] The classification of fistula-in-ano, as described by Parks et al. is based on the location of its tract in relation to anal sphincter muscle: intersphincteric, transsphincteric, suprasphincteric, or extrasphincteric.[2] Idiopathic fistula-in-ano most commonly occurs in healthy subjects, with cryptoglandular infection being the most widely accepted etiologic factor. The anal crypt gland penetrates the anal sphincter to varying degrees. Once obstructed, infection will ensue and suppuration will follow the least resistant path, which accordingly determines the location of the abscess (perianal, ischiorectal, inter-sphincteric) and the type of fistula.[3] Other common causes of anal fistula include chronic ulcerative colitis, Crohn's disease, tuberculosis, carcinoma of the rectum or anal canal, benign rectal strictures, foreign bodies or diverticulitis. Preoperative assessment and planning is very important. Medical history and physical examination are most important in the assessment phase. Management of fistula in ano demands accurate diagnosis followed by removal of tracts with preservation of continence function of anal sphincter. Magnetic resonance imaging (MRI) has become an integral part of the assessment of fistula as it can distinguish between sepsis and granulation tissue from sphincter muscles.[4] Properly performed MRI can be regarded as the "investigation of choice" for preoperative assessment, replacing surgical examination under anesthesia (EUA) in this regard. Although, endoanal ultrasonography is used by many surgeons in the preoperative workup of anal fistulas, MRI is generally superior to endoanal ultrasonograhy.[5] MRI helps not only to accurately demonstrate disease extension but also to predict prognosis, make therapy decisions, and monitor therapy.[6] We found MRI very informative and useful in accurately diagnosing different types of anal fistulas. As we use multi sequence imaging protocol that helps to accurately demonstrate disease extension, We find coronal and axial planes accurately demonstrates fistulous tracks in relation to the sphincter complex, ischiorectal fossa, and levator plate.

Conclusion

MRI findings of different types of fistulas were well correlated with the post-surgical findings regarding the primary tract, extension and their relationship with anal sphincter complex. So the pre surgical MRI examination of fistula will help surgeons in better surgical approach and successful outcomes.

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