

Magnetic Resonance Imaging - A Road Map for Peri Anal Fistulae in Comparison with Contrast Fistulography

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Objective: To assess the complete details of peri anal fistulae with the help of MR Imaging in comparison with contrast fistulography. **Design:** It is an observational and comparative study. **Place and duration:** This study was carried out in department of diagnostic radiology of Sir Ganga Ram and Masood Hospitals Lahore from January 2000- December 2002. **Subject and methods:** 15 patients with history of peri anal fistulae were included in this study. Contrast fistulography was performed with the help of water soluble contrast medium and these points were noted: 1- Site of external opening, 2- Extension of primary track, 3- Any secondary track, 4- Any evidence of abscess and 5-Position of internal opening. All the patients were advised MR Imaging and again above important points were evaluated in detail. **Results:** 12 males (80%) and 3 females (20%) were included in our study. Age range was 20 – 60 years and mean age being 42 years. MRI clearly demonstrated fistulae in 12 patients and 3 cases were diagnosed as sinus. But only 4 patients out of 12 identified on fistulography. External opening was visible with MRI as well as with fistulography in all patients. Primary tracks were also seen with both modalities but, in 3 patients length of primary tracks was found to be rather small as compared to MRI which showed complete extension. In only two patients abscesses / cavities were seen with the help of fistulography while on MRI 4 additional cases were identified. In none of patient Park's classification of fistulae was possible on fistulography instead this was possible only with MRI. **Conclusion:** MRI is an excellent examination for peri anal fistulae. It showed each and every aspect of peri anal fistulae which could be essential for excellent management in comparison with fistulography which is rather a invasive procedure, inconvenient for patient, radiation exposure to patient and there could be chance of exacerbation of inflammation.

Key words: Magnetic resonance imaging, contrast fistulography, peri anal fistulae.

Peri-anal fistulae is a relatively common problem, has long history was known to hippocrates (400B.C) and has attracted medical attention ever since¹. Few renowned personalities had been operated for peri-anal fistulae e.g. Charles Dickens (1841) and many late great surgeons have different opinions and experiences about peri-anal fistulae e.g. John of Ardene in 1376 said that the treatment of anal fistulae had fallen into disrepute because it was a troublesome condition which brought very little credit to surgeons and required long treatment. He advised his students not to do too much at one sitting in complex fistulae. Lowe in 1612 wrote that it was better not to operate on the very complicated fistulae owing to the danger of producing incontinence². Different etiologies have been proposed e.g. too much sitting. Other proposed etiologies have included 'deprived condition of the blood' riding on an omnibus and sitting on damp seats. However etiology of peri -anal fistulae remains largely obscure. Most practitioners believe to the crypto-glandular hypothesis of pathogenesis³. The anal glands first described by Chiari in 1878 are key to the crypto glandular hypothesis of peri anal fistulae. These glands arise at the level of dentate line (the squamo-columnar junction) in the mid anal canal and can penetrate the internal sphincter to reach the inter-sphincteric plane. These minute glands have no clear function and thought to become infected and produce an abscess which can extend in any direction. If this acute abscess fails to heal then a chronic infection will produce a persistently discharging fistulae. Exact treatment requires complete anatomical detail of the area as well as type of

fistulae. The anal sphincter is the most complex sphincter in the human body. The two sphincters surround the anal canal – the external and internal as shown in (Fig.1). External sphincter is formed of striated muscle, capable of strong voluntary contractions, contributes 15% of resting anal canal tone⁴. In contrast smooth muscle internal sphincter is involuntary which is a terminal condensation of rectal circular smooth muscle and contributes 85% of resting anal tone. The sphincters are separated by the inter -sphincteric space that contains fat and longitudinal muscle, the termination rectal longitudinal smooth muscle⁵. Its fibers pass directly down the inter-sphincteric space, splitting into septas that course between the bundles of the subcutaneous external anal sphincter to insert into the skin of the lower anal canal and perineum. The longitudinal muscle is the least understood ano-rectal structure, but is thought to play a role in binding and bracing the components of the anal canal together, fixing the perineum to the pelvis. The puborectalis is the highest muscle having a sphincteric effect and cradles the ano-rectal junction in a sling. It forms the medial edge of the fan like levator ani or levator plate, which divides the abdominal cavity from perineum, and merges with the proximal external sphincter. All of these muscles are very important and play a key role in continence so that incontinence may result if their integrity or innervation is damaged.

Anal fistulae can be defined as a track which connects external opening to a internal enteric communication, usually in the anal canal but occasionally in the rectum.

surgery. Fistulography showed secondary track in 1 patient while in 5 patients secondary track was identified on MRI. In none of cases Parks classification was possible with fistulography and this was only possible with MRI examination. High anal fistulas were observed in 4 of 12 patients on MRI while fistulography showed 1. MRI showed following types of fistulas according to Park's classification.

Table 1. Showing types of fistulae (n=12)

Type of Fistulae	n=	%age
Inter-sphincteric	5	41.66
Trans-sphincteric	3	25
Supra-sphincteric	2	16.66
Extra-sphincteric	2	16.66

Discussion

Anal fistulae is a common problem and can be irritating for surgeon as well as for patient if not treated properly. Success of surgery for anal fistulae depends on accurate assessment of fistulae, which is technically difficult⁷. Similar to our observation it is impossible to identify all changes with the help of fistulography as shown in (Fig. 3). Many techniques have been applied to see complete detail of anal fistulae for better preoperative assessment such as contrast fistulography has proved disappointing, we noted the same results⁸. Contrast fistulography is useless in telling fistulous classification and we could not determine the type of fistulae in any of patient in our study. Only 4 out of 12 fistulas were identified on fistulography while MRI was positive in all 12 cases. Abscess was detected in 2 patients and in MRI 4 patients were noted. Secondary track was visualized in only 1 out of 15 patients on fistulography but MRI showed 4 more cases. However, external fistulous opening was identified in all cases. Beside these less information obtained from the contrast fistulography, it is a rather an invasive procedure, painful, hazard of radiations and there could be exacerbation of inflammation.

Many authors have expressed the importance of careful digital examination under anesthesia by an experienced surgeon⁹, but many important findings can be missed by even a trained digit which may lead to complications / recurrence. Patients referred to our department never had digital examination so comparison with digital examination was not assessed. Our study demonstrated the high degree of accuracy of MRI in demonstrating the topography of anal fistulae. All the important aspects of fistulae important for management were properly assessed and the following main five points were noted and were essential according to us¹⁰ i.e. 1st location of external opening, 2nd the internal opening, 3rd primary track, 4th secondary track and 5th the presence or the absence of area of abscess. Many researchers have found the presence of primary disease process such as Crohn's disease¹¹, but we could not find any primary disease process. The optimal surgical management of anal fistulae is based on accurate preoperative knowledge of the classification of the fistulae. The excellent visualization of muscular planes,

septas, inter-muscular spaces, fat and areas of abscesses, which is its inherent natural characteristics, has made this modality so important for this purpose. High and low anal fistulae i.e. extension above the levator plate and was possible with the MRI because of better visualization of levator plate with this modality. Both axial and coronal images were essential for classifying the fistulae by looking track extensions which was seen as hypo intense line on T1 weighted images especially extension through bright fat on this sequence, while on T2 weighted images it was hyper intense and inflammatory tissue /reaction was also identified with this sequence, but STIR sequences found to be more accurate for this purpose. We found that coronal and axial images both were used in assessing the full course of the fistulae. The coronal images gave the clearest detail of levator ani muscle, which is an important landmark especially deciding high or low anal fistulae. Axial image provides the best definition of inter-sphincteric space although the site of the external opening and course of the primary track was identified on T1 weighted images as shown in (Fig. 4), as a hypo intense track in bright fat. These were most clearly demonstrated on STIR sequences as shown in (Fig. 5). STIR imaging is particularly useful for demonstrating anal fistulae because the pathology stands out so clearly from all the adjacent normal tissues the same findings were also observed by the P.G. Baker and his colleagues¹². The pus within fistulae identifies itself as high signals against background of low signal fat. The same changes were noted with T2 weighted images, but STIR images were superior for detecting these changes and especially in locating areas of occult inflammation. T1 weighted images can be omitted to reduce time, but it provides useful information regarding normal anatomical features therefore increasing the level of confidence in evaluating the course of the fistulous track. The coronal plane was particularly useful in relating the fistulae to levator ani muscle. Horse shoeing presence is also better seen with axial images, but we could not identify any case of horse shoe type of secondary track. Most anal fistulae were simple i.e. 11 out of 15 making 73.33% which is almost same with another study¹³ either as superficial or simple inter-sphincteric fistulae.



Fig.3: Contrast fistulography showing fistulous track outlined by contrast medium but showing no detail of anal muscular complex.

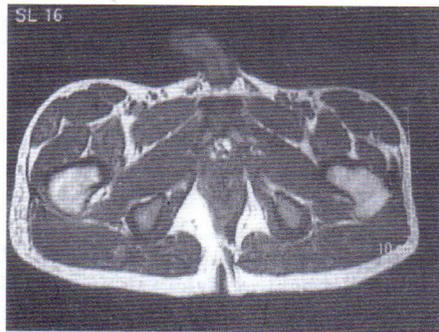


Fig. 4: Axial T1 weighted image showing a transsphincteric track in left posterior quadrant with an internal opening at 6 o'clock.



Fig. 5: Coronal STIR sequence at posterior anal canal level showing a transsphincteric primary track posteriorly with internal anal canal opening at 6 o'clock position.

Conclusion

MRI is a highly accurate, non invasive technique for assessing peri anal fistulae. MRI provides anatomical and pathological data. It not only identifies the presence and course of the primary track but also demonstrates the presence, site and shape of any secondary extension or abscess. So we think that MRI is excellent examination for

peri anal fistulae evaluation and should be recommended to see details necessary for management to decrease rate of recurrence. MRI can be gold standard in future for peri anal fistulae.

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