

Digital Rectal Examination versus Magnetic Resonance Fistulography in Diagnosis of Perianal Fistula

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Introduction: Fistula in ano disease has significant implications for the patient's quality of life as a sequelae range from minor pain and social hygienic embarrassment to frank sepsis. The majority of fistula in ano has a single simple track that is easily identified through PR examination and during surgery, however 5%-15% of cases have more complicated course, with high recurrence rate due to errors in assessing and dealing with the internal openings, the primary tract, or any secondary extensions and abscesses, particularly supralelevator sepsis. Although most fistulae are simple and easy to treat, some pose greater problems. Fear of causing incontinence and lack of confidence in fistula assessment prompt most referrals from other surgeons.

Aim of work: To compare digital rectal examination and Magnetic Resonance Fistulography findings in diagnosis of perianal fistula and its type according to Parks classification depending on intraoperative findings.

Patients and methods: This is a Cross-sectional study (Diagnostic accuracy testing) was done on 30 patients presented to outpatient clinic at El Demerdash hospital and Dar Elshefaa hospital examined and diagnosed with perianal fistula by colorectal consultants and had done Magnetic Resonance Fistulography.

Results: This study's results showed that there is no preference between preoperative examination findings and MRI findings in the determination of the type of tract of fistula in ano; however, there's a significant preference for preoperative examination over MRI findings in the detection of external and internal openings.

Conclusion: There is no preference between preoperative examination of a fistula in ano by experienced colorectal consultants and MRI findings in the determination of fistula type, while preoperative examination has a greater preference in the detection of external and internal openings over MRI findings.

Key words: Digital rectal examination, magnetic resonance fistulography, perianal fistula.

Introduction

A fistula-in-ano is an abnormal hollow tract or cavity that is lined with granulation tissue and that connects a primary opening inside the anal canal to a secondary opening in the perianal skin; secondary tracts may be multiple and can extend from the same primary opening.¹

Most fistulas are thought to arise as a result of cryptoglandular infection with resultant perirectal abscess. The abscess represents the acute inflammatory event, whereas the fistula is representative of the chronic process. Symptoms generally affect quality of life significantly, and they range from minor discomfort and drainage with resultant hygienic problems to sepsis.¹

The majority of anal fistula has a single simple track that is easily identified through PR examination and during surgery, however 5%-15% of cases have more complicated course, with high recurrence rate due to errors in assessing and dealing with the internal openings, the primary tract, or any secondary extensions and abscesses, particularly supralelevator sepsis. Although most fistulas are simple and easy to treat, some pose greater problems. Fear of causing incontinence and lack of confidence in fistula assessment prompt most

referrals from other surgeons.²

MRI provides information about the anatomical plane in which the fistula is located as well as on the relationship between the fistula track and anal sphincters, pelvic floor and the levator ani muscle. Despite this, there is a percentage of cases where operative findings are not identical to MRI findings. Therefore digital rectal examination by experienced hand still plays a crucial role in the diagnosis of perianal fistula.³

Aim of the work

The aim of this study is to compare digital rectal examination and Magnetic Resonance Fistulography findings in diagnosis of perianal fistula and its type according to Parks classification depending on intraoperative findings.

Patients and methods

This was a Cross-sectional study (Diagnostic accuracy testing) was done on 30 patients presented to outpatient clinic at El Demerdash hospital and Dar Elshefaa hospital examined and diagnosed with perianal fistula by colorectal consultants and had done Magnetic Resonance Fistulography.

Patients presented with perianal fistulas irrespective to their age and gender were included in the study

while patients with Chron's disease, recurrent fistula and active abscess on fistula.

Each patient was introduced to the study by a member of the research group and receive an explanation of the study protocol with protection of the privacy of research participants. An oral informed consent regarding participation in the trial and explanation of the study was obtained and signed before enrolling in the study.

Both the MRI findings and preoperative digital rectal examination findings of every patient will be compared with his /her operative finding will be analysed using SPSS version 24.0 (IBM software suite; Armonk, NY). Data will be expressed in its frequency and percentage as well as mean & standard deviation.

Patients diagnosed with perianal fistula by digital rectal examination with identification of the tract, external opening and internal opening according to parks classification along with the examination was done by experienced consultants in both El-Demerdash and Dar El Shefa hospitals. Patients underwent magnetic resonance Fistulography with data considered concerning the tract, internal opening & external opening. All the patients were prepared pre-operatively by full history taking, clinical assessment and full investigations.

All patients during intraoperative setting were at lithotomy position. Examination under anaesthesia was done with assessment of the tract, external opening & internal opening. Surgical procedure (Mobilization of the tract, seton insertion, supralelevator tract opening.... etc.) were decided accordingly.

The data collected from digital rectal examination & magnetic resonance imaging was evaluated according to the intra-operative management.

Results

This study was conducted on 30 patients with different types of perianal fistulae, and the average age was from 22 to 64 years.

Depending on final operative data 60% of cases were transsphincteric fistulae, 20% were intersphincteric, 13% were horseshoe fistulae and the remaining 7% were extrasphincteric and multiple tract fistulae.

On an overview, clinical examination was matching the operative finding in 26 cases out of 30 (about 86%), while the MRI findings percentage of accuracy was slight lower 23 out of 30 cases (About 77%), that includes 4 single tract cases that misdiagnosed

as multiple tract fistulae. These results show statistical insignificance between examination and MRI to determine the type of fistula preoperatively.

The 4 mistaken cases from clinical examination were transsphincteric fistulae that misdiagnosed as intersphincteric, while the other types of fistulae was not mistaken by examination. And the mistaken cases from MRI were horse shoe fistula that misdiagnosed as multiple tract fistulae or transsphincteric one.

The external opening was easily detected during preoperative clinical examination in all cases (100%), while the MRI detection of external opening percentage of accuracy was 8 cases out of 30 cases (About 27%). This showed statistical highly significant accuracy of clinical examination over MRI findings.

Also, preoperative examination showed highly significant accuracy in detection of internal opening as it missed only 3 cases out of 30 (About 10%) while MRI has missed 11 out of 30 cases (about 37%).

Multiplicity means diagnosis of more than one fistula tracts that was always correctly diagnosed preoperatively regarding the intraoperative finding, which was found in this study in 2 cases.

On the other hand, the MRI findings misdiagnosed 4 cases as multiple fistulae when there were not. 2 of these cases were horse shoe fistulae and the others were trans-sphincteric.

According to this chart preoperative examination was successfully able to diagnose 77% of transsphincteric type, 100% of horseshoe type and 100% of intersphincteric type (Including about 22% misdiagnosis which was transsphincteric type intraoperative)

Clinical examination also was able to detect 100% of multiple tracts whoever the number of cases with multiplicity is low and cannot be correctly assessed (About 2 cases only).

According this chart MRI was successfully able to diagnose about 85% of transsphincteric fistula, 83% of intersphincteric fistula and 25% only of horse shoe fistula.

MRI was also able to detect 100% of multiple tract fistulae but there were misdiagnosed cases to be multiple tract and was not according to intraoperative data (25% of cases were horse shoe fistula and 25% were single tract branched transsphincteric type).

Table 1: Age and sex of the study group

		No. = 30
Age	Mean±SD	40.97 ± 10.57
	Range	22 – 64
Sex	Female	7 (23.3%)
	Male	23 (76.7%)

Table 2: Comparison of fistula type between examination, MRI

Type of fistula	Examination		MRI		Test value*	P-value
	No.	%	No.	%		
Not detected	0	0.0%	0	0.0%	2.022	0.364
Transsphincteric	14	46.7%	18	60.0%	1.440	0.487
Horse shoes	4	13.3%	1	3.3%	2.222	0.329
Intersphincteric	10	33.3%	7	23.3%	1.518	0.468
Extrasphincteric	1	3.3%	1	3.3%	0.000	1.000
Multiple tract	2	3.3%	6	6.7%	0.523	0.770

Table 3: Comparison between examination, MRI regarding Ext op, Int op and multiplicity

		Examination		MRI		Operation		P-value
		No.	%	No.	%	No.	%	
Ext op	Not detected	0	0.0%	22	73.3%	0	0.0%	0.001
	Detected	30	100.0%	8	26.7%	30	100.0%	
Int op	Not detected	3	10.0%	11	36.7%	0	0.0%	0.007
	Detected	27	90.0%	19	63.3%	30	100.0%	
Multiplicity	Not detected	28	93.3%	24	80.0%	28	93.3%	0.165
	Detected	2	6.7%	6	20.0%	2	6.7%	

Discussion

As multiple medical and surgical treatment options exist, imaging and examination play a critical role in accurately characterising fistulae in ano to individualize management strategies.

A variety of radiological techniques have been tried to improve preoperative assessment of fistulas in an attempt to identify patients with complex fistulae and reduce the risk of recurrence. Contrast fistulography, endoanal ultrasonography, and computed tomography have all been found to be less reliable than digital rectal examination by an experienced surgeon in predicting the course and complexity of fistulae.⁴

Preoperative MR imaging of fistulae in ano has been increasingly used since Halligan et al. reported that it was used to correctly classify fistulas in 14 (88%) out of 16 patients.⁵

Subsequent studies confirmed this success (Schwartz et al., 2001; Maier et al., 2016 and Frudinger et al., 2002).^{6,7,8}

Our study found that the accuracy of digital rectal examination was about 86%, while MRI data was about 77%.

In a study of 104 patients with suspected fistula in ano by Buchanan et al., clinical examination correctly classified the fistula tract in 66 patients (61%) compared to 87 patients (81%) by MR imaging, and that supported our results.⁹

In contrast to our results, in a study carried out by the Italian Society of Radiology for patients with fistula in ano from 2014 to 2017 to evaluate preoperative scans for proper diagnosis, MRI was one of the main elements, and the study revealed 98% accuracy to detect the 1ry tract.¹⁰

But unfortunately, they didn't mention any diagnostic or clinical data or the operative outcome of these patients.

Our study found that preoperative examination is relatively more accurate in the diagnosis of horseshoe fistulae and multiple tract fistulae regardless of the type of fistula according to Park's classification, and these findings match the intraoperative findings.

Our results also showed that preoperative examination was less accurate in diagnosing low transsphincteric fistulae and identified them as intersphincteric fistulae, about 22% of the transsphincteric type (4 out of 18 cases). However, this discrepancy didn't change the surgical decision (Laying open the tract).

Our findings were supported by Siddiqui et al.'s findings, which showed 85% accuracy of preoperative examination in 29 out of 34 cases in comparison to intraoperative findings; also, preoperative examination was accurate in all cases of transsphincteric type and 83% of intersphincteric type.¹¹

Our study proved that MRI is relatively more accurate in diagnosis of intersphincteric fistulae and transsphincteric fistulae especially low transsphincteric type, while it is relatively less accurate in determination of horse shoe fistulae, as MRI in some cases misdiagnosed horse shoe fistula as multiple tract fistulae or single tract transsphincteric one. Also MRI has accurate results in diagnosis of multiple fistulae (Highly sensitive), but its findings were not specific as it has false positive results.

Beets-Tan et al.¹² confirmed our results, as MRI accuracy in the detection of transsphincteric fistula is 90%, intersphincteric type is 91%, and horseshoe type is 66% in a study carried out on 56 patients.¹²

Another study carried out by the Turkish Society of Radiology in 2018 on 136 patients has also supported our results, as MRI accuracy with horseshoe type was 31% depending on final operative data (Konan et al., 2018). Another study of 229 patients, MRI added significant information in patients with horseshoe tracts with nearly same results.¹²

The external opening is usually detected by examination, either by inspection or palpation, as one of the components to detect a fistula in ano; however, it may be absent or obliterated. Our study has found that preoperative examination succeeded in detecting external openings in all cases, while MRI detected only 27% of external openings. That may be due to the fact that sometimes external openings are fibrosed, obliterated, or the fistula itself does not reach the skin.

Konan et al.¹³ reported that MRI accuracy to detect external opening is higher in fistulae with an orifice 2 cm away from the anal canal with 47.1% accuracy in comparison to an orifice near the anal verge with 10.2% accuracy, and this is largely consistent with our results.¹⁴

Our study proved that preoperative examination is significantly accurate in detecting internal openings (About 90% of cases).

Shi & Zheng¹⁵ has discussed the mechanism of determination of internal opening as per experienced colorectal consultants, as the internal opening of a fistula in ano is located in the dentate line. A digital rectal examination can locate a well-defined small knot in the dentate line; however, palpation of the internal opening can be painful in some patients, which may interrupt proper detection of the internal opening.¹⁵

The internal opening of a horseshoe fistula is almost always in the posterior median dentate line of the anal canal at 6 o'clock. Internal opening in recurrent or inactive fistulas is usually easier to palpate, whereas during abscess formation or in active fistulas, internal opening is not obvious and is hard to feel.¹⁶

Internal openings can be identified intraoperatively through palpation, injection of gas through the external opening, or dimpling of the internal opening after mobilisation and traction of the tract.

Our study also proved that MRI has less accuracy to determine the internal opening, as its accuracy is 37%, which may be due to the difficulty of identifying the dentate line and the part of the tract under the anal mucosa, and the connection between them cannot be detected easily. MRI mostly finds it difficult to detect the exact site of the internal opening in some cases, but it can give information about the direction of the tract and the relations with surrounding structures that would give an idea about the internal opening.

Greer & Taylor¹⁷ proved the same explanation, as the vast majority of anal fistulas open into the anal canal at the level of the dentate line; unfortunately, the dentate line cannot be identified as a separate anatomic entity by MRI, but its general position can be estimated with sufficient accuracy for the imaging assessment.¹⁷

Conclusion

There is no preference between preoperative examination of a fistula in ano by experienced colorectal consultants and MRI findings in the determination of fistula type, while preoperative examination has a greater preference in the detection of external and internal openings over MRI findings.

References

1. Thipphavong S, Costa AF, Ali HA, Wang DC, Brar MS, Jhaveri KS: Structured reporting of MRI for perianal fistula. *Abdominal Radiology*. 2019; 44(4): 1295-1305.
2. Phillips J, Lees N, Arnall F: Current management of fistula-in-ano. *Br J Hosp Med (Lond)*. 2015; 76(3): 142, 144-7.

3. Chauhan NS, Sood D, Shukla A: Magnetic resonance imaging (MRI) characterization of perianal fistulous disease in a rural based tertiary hospital of North India. *Polish Journal of Radiology*. 2016; 81: 611.
4. Ang D, Vollebregt P, Carrington EV, Knowles CH, Scott SM: Redundancy in the international anorectal physiology working group manometry protocol: A diagnostic accuracy study in fecal incontinence. *Digestive Diseases and Sciences*. 2022; 67(3): 964-970.
5. Halligan S: Magnetic resonance imaging of fistula-in-ano. *Magnetic Resonance Imaging Clinics*. 2020; 28(1): 141-151.
6. Schwartz DA, Wiersema MJ, Dudiak KM, Fletcher JG, Clain JE, Tremaine WJ, Sandborn WJ: A comparison of endoscopic ultrasound, magnetic resonance imaging, and exam under anesthesia for evaluation of Crohn's perianal fistulas. *Gastroenterology*. 2001; 121(5): 1064-1072.
7. Meyer A, Bouchetemplé P, Costentin B, Dehesdin D, Lerosey Y, Marie JP: Lateral semicircular canal fistula in cholesteatoma: Diagnosis and management. *European Archives of Oto-Rhino-Laryngology*. 2016; 273: 2055-2063.
8. Frudinger A, Halligan S, Bartram CI, Price AB, Kamm MA, Winter R: Female anal sphincter: Age-related differences in asymptomatic volunteers with high-frequency endoanal US. *Radiology*. 2002; 224(2): 417-423.
9. 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.
10. Brillantino A, Iacobellis F, Reginelli A, Monaco L, Sodano B, Tufano G, Grassi R: Preoperative assessment of simple and complex anorectal fistulas: Tridimensional endoanal ultrasound? Magnetic resonance? Both?. *La Radiologia Medica*. 2019; 124: 339-349.
11. Siddiqui MR, Ashrafian H, Tozer P, Daulatzai N, Burling D, Hart A, Phillips RK: A diagnostic accuracy meta-analysis of endoanal ultrasound and MRI for perianal fistula assessment. *Diseases of the Colon & Rectum*. 2012; 55(5): 576-585.
12. Beets-Tan RG, Beets GL, Van der Hoop AG, Kessels AG, Vliegen RF, Baeten CG, Van Engelshoven JM: Preoperative MR imaging of anal fistulas: Does it really help the surgeon?. *Radiology*. 2001; 218(1): 75-84.
13. Konan A, Onur MR, Özmen MN: The contribution of preoperative MRI to the surgical management of anal fistulas. *Diagnostic and Interventional Radiology*. 2018; 24(6): 321.
14. Garg P, Singh P, Kaur B: Magnetic resonance imaging (MRI): Operative findings correlation in 229 fistula-in-ano patients. *World Journal of Surgery*. 2017; 41: 1618-1624.
15. Shi R, Zheng L (Eds.): Diagnosis and treatment of anal fistula. *Springer*. 2021.
16. Limura E, Giordano P: Modern management of anal fistula. *WJG*. 2015; 21(1): 12.
17. Greer MLC, Taylor SA: Perianal imaging in Crohn disease: current status with a focus on MRI, from the AJR special series on imaging of inflammation. *American Journal of Roentgenology*. 2022; 218(5): 781-792.