

Original paper

Fistula in Ano; the Correlation of Pre-Operative Magnetic Resonance Imaging with Video Assisted Anal Fistula Treatment Findings

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Abstract

Background: Fistula-in-ano (FIA) is a common medical problem. Magnetic resonance imaging (MRI) is an excellent modality for the pre-operative evaluation of this condition. Video assisted anal fistula treatment (VAAFT) is a relatively new modality introduced in 2006, and is both diagnostic and operative.

Aim: To correlate MRI findings with video assisted anal fistula treatment findings.

Patients and methods: Thirty-five patients with clinically diagnosed FIA, had a pelvic MRI followed by VAAFT surgery.

Results: Mean age was 42 years. In one case both MRI and VAAFT revealed a sinus. In 29 cases (82.8 %) there was concordance regarding the presence of an FIA, both tracts and internal openings. In 5 cases (14.2%), there was no concordance regarding the presence of an internal opening.

Conclusion: MRI is essential in the pre-operative assessment of FIA especially for clinically complex fistulas.

Key words: fistula in ano (FIA). Video assessment anal fistula treatment (VAAFT). Magnetic resonance imaging (MRI)

Introduction

Fistula in ano is a common medical problem with incidence rates of 1-2.3 /10000/year, affecting males more than females^(1,2).

MRI is an excellent modality (of choice) for the pre-operative evaluation of FIA and can give a roadmap for appropriate surgical management; it also reduces the rate of recurrence after surgery^(3, 4, 5). MRI is superior to surgery when predicting the outcome⁽⁶⁾.

Surgery is the only effective modality for treating FIA⁽⁷⁾. VAAFT is a relatively new modality, introduced in 2006, and is both diagnostic and operative. The principles of VAAFT are direct identification of the fistula tract, accessory tracts, any abscesses and more importantly, the internal opening

for proper treatment under direct vision. It is safe and performed without a gluteal wound, but carries a relatively high recurrence rate^(8, 9, 10). It can also be performed in children⁽¹¹⁾

Patients and methods

Thirty-five patients with a clinical diagnosis of FIA had a pelvic MRI. Video assisted anal fistula treatment was carried out within two weeks of the MRI evaluation.

MRI protocol

The MRI examinations were carried out at Al-Hussein Medical City, using Siemens Avanto (1.5 Tesla), Siemens Symphony (1.5 Tesla) and General Electric Optima (1.5 tesla) at Al-Kafeel Super Specialty Hospital. No preparation was required.

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The MRI sequences used were T1w axial and coronal, T2w axial, coronal and sagittal, and T2w fat saturation axial and coronal.

Pelvic diaphragm and the entire perineum were included in the axial and coronal planes. The region from the sacrum to the pubic symphysis was included in the sagittal plane.

All cases underwent surgery within 1-2 weeks of the MRI examination at Al-Kafeel Super Speciality Hospital with a VAAFT kit which included a rigid fistuloscope, obturator, unipolar electrode and endobrush (Karol stores) (Fig. I).

Results

The mean age of the patients was 42 years (range 27 – 70 years), 94.3 % were male. Thirteen cases (37.1 %) presenting as recurrent fistulas.

In all cases, both MRI and VAAFT identified the tracts giving an MRI sensitivity of 100% for identification of the tract. In 29 cases (82.8 %), there was concordance regarding the presence of the fistulas tracts and location of internal openings. In one case, both MRI and VAAFT did not identify the internal

opening; the tract was at a blind end, lying subcutaneously and so was regarded as a sinus (Fig. 2). In 5 cases (14.2%), no concordance was seen regarding the internal opening (Table 1).

MRI could not locate the internal openings in two fistulas, giving an MRI sensitivity of 93.7% when correlated to VAAFT (Table 2).

The MRI revealed that the majority of fistulas were intersphenctric (57.5%) and most internal openings were posterior at 5-7 o'clock 63.6%) (Table 3). Abscesses were seen in 12 of the 35 patients (34.2 %).

Discussion

Fistula in ano is a common medical problem with an incidence of 1-2.3/10000 people (1-2). Most cases are idiopathic⁽¹²⁾. The treatment is surgical, except for infants, as conservative treatment here usually gives good results^(7, 13).

Seventy eight-eighty seven% of FIA are found in males^(5, 14, 15). In the present study, the majority of cases were male (33 of 35= 94.3%). This may be due social and religious factors, as females in Iraq prefer a female surgeon to manage medical problems at the perianal region.

Table 1. Results of the five cases that showed non-concordance between the MRI and VAAFT regarding the presence of an internal opening.

	MRI	VAAFT
Two cases	-ve	+ve
Two cases	+ve	-ve
One case	Two +ve fistulas	One +ve and one -ve

Table 2. Correlation of internal opening of fistula as identified by MRI and VAAFT.

	MRI and VAAF (MRI true positive)	By VAAFT only (MRI true negative)	By MRI only	Not seen by MRI and VAAFT	MRI sensitivity	MRI specificity
No of fistulas	30	2	3	1	93.7	100%

**One patient had two FIA with two internal openings as identified via MRI

Table 3. Location of the internal openings and types of fistulas as seen by MRI (33 fistulas in 32 patients).

Location of internal fistula	Posterior 21 (63.6%)	Anterior 5 (15.1%)	Lateral 7 (21.1%)	33
Type of fistula	Intersphenctric 19 (57.5 %)	Transphenctric 11(33.3)	Extrasphenctric 3 (9 %)	33

In the current study, the most common location of internal openings was posterior at 5-7 o'clock (63.6 %), followed by a lateral location (21 %), the least common being anterior at 1-2 o'clock (15%). Similar findings have been reported by which the posterior location is the most common ^(16, 17, 18). This may be due to the anatomical distribution of anal glands which are more numerous around 6 o'clock within the RT and LT lower anal quadrants ⁽¹⁹⁾.

In the present study the most common type of FIA was intersphinctric (57.5%), followed by transphinctic (33.3%) then extrasphinctric (3%). These results are similar to those of other studies which found the intersphinctric fistula to be the most common ranging from 41 to 70% ^(14, 20, 21).

The concordance rate between MRI and VAAFT was 85.7 % (30 of 35 patients). In 5 of the 35 patients (14.2 %), non-concordance between MRI and VAAFT was observed. In one of these 30 concordant cases, the internal opening was not seen by either MRI or VAAFT and so it was regarded as a sinus ⁽²²⁾.

The MRI identified all the fistulas seen with VAAFT, including the internal openings, with the exception of 2 patients in whom the fistulas tracts were detected while the internal openings could not be identified (Fig. 3), giving a sensitivity of 100% for fistula tract visualization and 93.7% for internal opening identification. MRI proved to be highly sensitive (97-100%) for the detection of the fistula tract ^(23, 24). Non-visualization of the internal opening is a recognized finding of MRI with a sensitivity of 90-97% ^(23, 25, 26). Although some conclude that MRI can diagnose a sinus when the internal opening is not seen ⁽²⁸⁾, the present study showed that when MRI does not show the internal opening, surgery may reveal a fistula.

VAAFT is a safe and minimally invasive approach for treating FIA ⁽¹⁾, and has only

recently been introduced in Iraq. In the current study, VAAFT could not identify the true fistula tract and consequently the internal opening in three fistulas that were seen by MRI. For one patient, there were multiple accessory tracts (Fig. 4); for a second patient, there was an intra-operative failure due to a fistula tract which was too long (17 cm) (Fig. 5) while for the third patient where the MRI identified two fistulas, VAAFT identified a fistula and a sinus (Fig. 6). All these fistulas were recurrent with marked inflammation.

Other studies have revealed that non-visualization of true fistula tracts by VAAFT was due to branching fistula, horse shoe type fistula, multiple abscesses or fibrosed tracts ^(8, 27, 29, 30); these may lead to failure of VAAFT or conversion from VAAFT to classical surgery ^(6, 22). The present study also showed that a long tract is another cause for failure of VAAFT surgery.

Some studies ^(6, 7) have visualized all fistulas and internal openings by VAAFT. This may be due to the type of fistulas and personal experience of surgeons or that some fistulas had been missed, explaining the relative high recurrence rate ⁽³¹⁾.

In 4-8% of fistulas, MRI may identify false positives. This may be due to fibrosed or healed fistulas incorrectly diagnosed by MRI as fistulas ^(5,32, 33) but may also be due to fistulas missed at surgery as some patients with MRI positive - surgery negative fistulas, show poor healing with the later development of fistulas identified at the next surgery ^(23, 34). Recurrence would appear to be inevitable if the internal opening is not identified ⁽³⁵⁾. In the current study, fistulas missed by VAAFT could not be regarded as false positives since internal openings were obvious on MRI.

A combination of MRI sequences and imaging planes are necessary for the accurate evaluation of FIA ⁽⁵⁾. The whole perineum should be included, particularly in the sagittal plane to evaluate the pre-

sacral space ^(4, 36). The present study confirms these results (Fig 7).



Figure 1. VAAFT kit

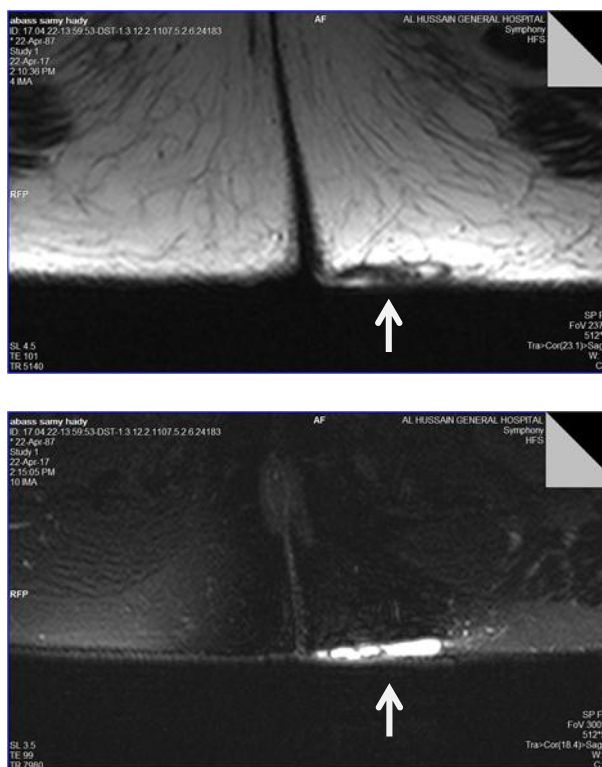


Figure 2. MRI T2w (A) and T2W fat saturation (B) showing the inus (arrow) which proved to be blind end during VAAFT.

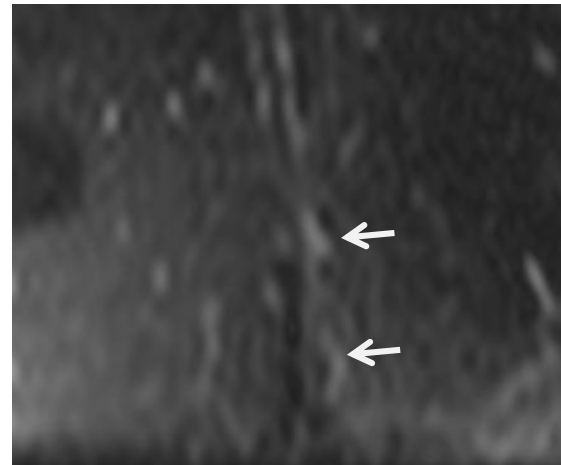


Figure 3. T2w fat saturation image showing a fistulous tract only (arrows). No internal opening could be identified.

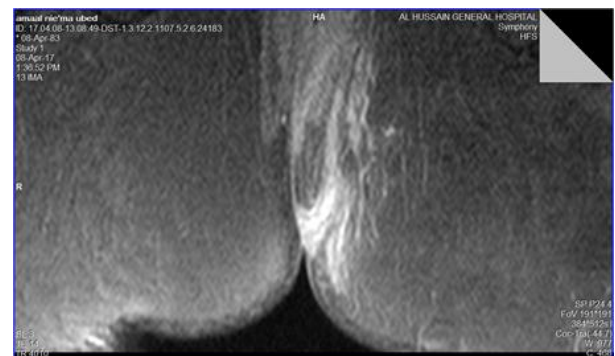


Figure 4. Fistula in ano with marked inflammatory reaction with the multiple tracts.

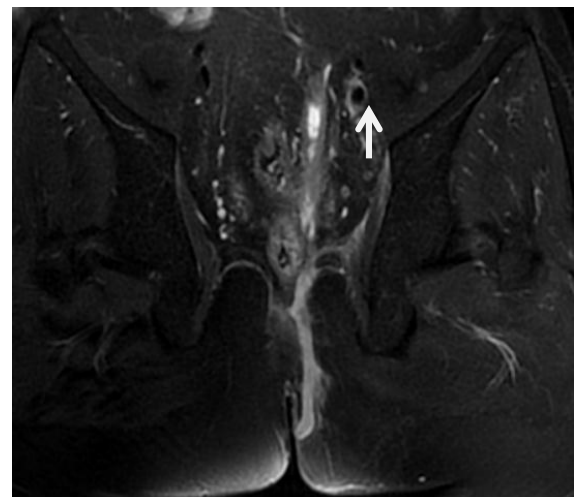


Figure 5. long fistula tract (17 cm).

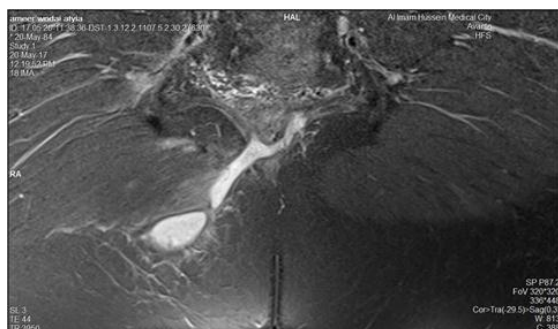


Figure 6. Part of complex fistula with an abscess. VAAFT could not identify the internal opening.

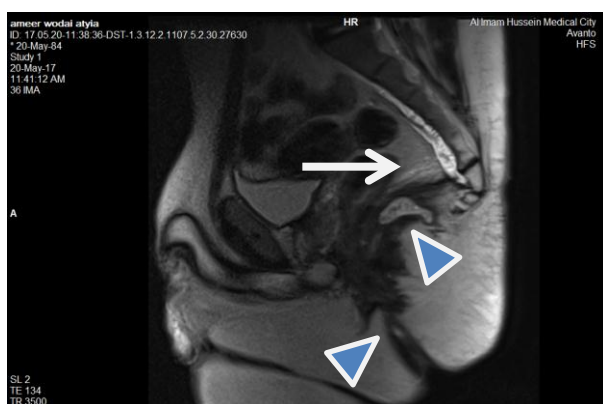


Figure7. collection in presacral space (solid arrow) associated with complex fistula in ano (arrow head)

Conclusion

MRI is essential for pre-operative assessment of FIA at least for clinically complex fistulas.

Complexity of the fistula and the length of its tract are more important regarding the VAAFT technique than the classification of fistulas which is necessary for the conventional surgical management of FIA.

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