

## REVIEW

## Significance of MRI in the treatment of perianal fistula

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**Abstract:** *Objectives:* Objective of the study was to examine patients with fistula preoperatively with MRI and then compare with operative findings.

*Background:* Most common cause of perianal suppuration is infection of cryptoglandular origin. This results in simple intersphincteric abscess, or spreading of infection in cranial or caudal direction, horizontally or circularly. To choose the correct surgical therapy, sufficient diagnostic is necessary. This includes clinical examination, endorectal ultrasonography, rectoscopy with fistula injection with hydrogen peroxide or dye. More and more often MRI is used.

*Methods:* In 2007 19 patients with perianal fistula were operated on. In 14 patients, preoperative MRI was done without contrast dye or probing. Fistulas were classified on 5-grade scale. We treated simple fistulas with fistulectomies, in three cases of complicated fistulas cutting setons were used.

*Results:* We examined 14 patients and confronted preoperative MRI result with operative findings. In 12 patients results matched, in two patients peroperatively diagnosed and treated fistula did not show on MRI. One was transsphincteric fistula with abscess and one was simple transsphincteric fistula. Because of low number of patients, statistical interpretations are not significant.

*Conclusions:* Results are preliminary, we continue in prospective analysis. MRI may be useful for successful treatment by correct assessment of the extent of disease. It is necessary to consider cost-effectiveness when indicating MRI (Tab. 6, Fig. 3, Ref. 11). Full Text (Free, PDF) [www.bmj.sk](http://www.bmj.sk).

Key words: MRI, perianal fistula.

Great number of possible causes of anorectal suppuration and consequent fistula formation exist (Tab. 1) (2), most common being a non-specific infection of cryptoglandular origin (11). Anal glands facilitate defecation by stool lubrication. Most surgeons find obstructed, abnormal, or infected anal glands as a source of anorectal abscess and fistula. Infection starts in the intersphincteric compartment and may result in simple intersphincteric abscess or the infection may spread vertically upwards or downwards, horizontally or circularly (“horse shoe” fistula). According to fistulas characteristics, these may be divided into 4 types (7).

Classification and percentual distribution according to literature is in Table 2.

The most common sign of abscess is perianal pain and most common sign of fistula is chronic suppuration from paraanal opening. Clinical examination of fistula tract, which is palpable or explorable with probe, is often sufficient for diagnosis. To choose the right treatment, much more information is needed, especially regarding fistula location, branching, location of in-

ner fistula opening and relationship to sphincteric complex. Possible studies together with their importance are in Table 3.

In 2006 the establishment of Dr. Magnet Ltd. allowed us to do MRI scans in our department. Consequently, we started examining the possibilities of MRI and its value in diagnosis of perianal fistulas. The purpose of our study was to compare results of MRI with operation findings in perianal fistulas treated in our department. Our ambition was to perform preoperative

**Tab. 1. Possible causes of anorectal fistula.**

Persistent cryptoglandular sepsis
Anal fissure
Trauma
Malignancy – anal, rectal, leukemia, lymphoma, pelvic malignancy
Radiation injury
Anal intercourse
Foreign body
Inflammatory bowel disease
Acquired immunodeficiency syndrome
Actinomycosis
Tuberculosis
Hidradenitis suppurativa
Pilonidal disease
Diverticulitis
Lymphogranuloma venereum
Osteomyelitis
Urethroperineal fistula

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**Tab. 2. Classification and percentual distribution of anorectal fistula (Parks, 1976).**

Intersphincteric – the fistula track is confined to the intersphincteric plane – 70 %
Transsphincteric – the fistula connects the intersphincteric plane with the ischiorectal fossa by perforating the external sphincter – 23 %
Extrasphincteric – the track passes from the rectum to perineal skin, completely external to the sphincteric complex – 5 %
Suprasphincteric – similar to transsphincteric, but the track loops over the external sphincter and perforates m. puborectalis and m. levator ani – 2 %

**Tab. 3. Examination and studies in the diagnosis of perianal fistula.**

Clinical examination – mostly sufficient
Rectoscopy (colonoscopy) with instillation of hydrogen peroxid or dye
Radiographic fistulography – unsuitable
Endoanal ultrasonography
External MRI – optimal
Endoanal MRI – expensive
CT – without advantage

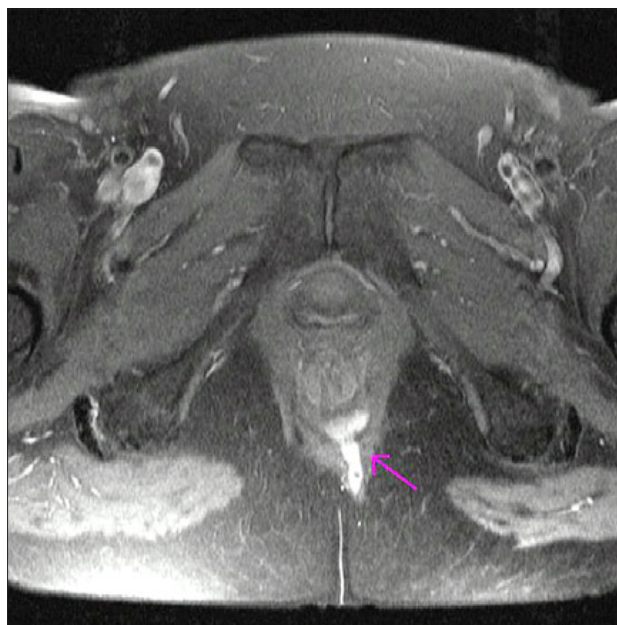
MRI scan in all operated patients and together with Dr. Magnet Ltd. staff contribute to a correct evaluation.

**Material and methods**

19 patients were included in this study. All of them were operated on in 2007 at the IVth Surgical Department of University Hospital, with diagnosis of perianal fistula. The study group consisted of 14 men and 5 women, aged ranging from 30 to 62, average age 49.4 yrs. Diagnosis of perianal fistula was done by clinical examination, probing of fistula, and rectoscopic exam with search for inner fistula opening. We managed to do MRI in 14 patients. The method of external coil was used, without fistula probing or injection of contrast media (GdDTPA – gadolinium diethylene triamine pentaacetic acid). Two MRI modes were used: PDFS – proton density fat saturation suppression, and STIR – short time inversion recovery. St. James’s University Hospital classification was used (6). This classification is shown in Table 4. After the operation, peroperative findings and preoperative MRI scan results were confronted. We treated simple fistulas with fistulectomy after dye injection (Patent blau), and complicated fistulas with use of cutting setons. We used these in one suprasphincteric, one extrasphincteric and one complicated transsphincteric fistula with abscess (Figs 1, 2, 3).

**Results**

Results are shown in Table 5. Preoperative MRI was done in 14 out of 19 patients. In 12 patients the results matched. In two patients peroperatively diagnosed and treated fistula was not seen on MRI. Of these two, one was transsphincteric fistula with ab-



**Fig. 1. Grade 3 “horse shoe” fistula.**



**Fig. 2. Grade 4 fistula.**

scuss, and the second one was transsphincteric fistula. Because of the low number of patients, statistical interpretations are not significant.

**Discussion**

The possibilities of surgical therapy are shown in Table 6. It is important to choose the correct surgical therapy that will prevent fistula recurrence (there are known cases of repeated opera-

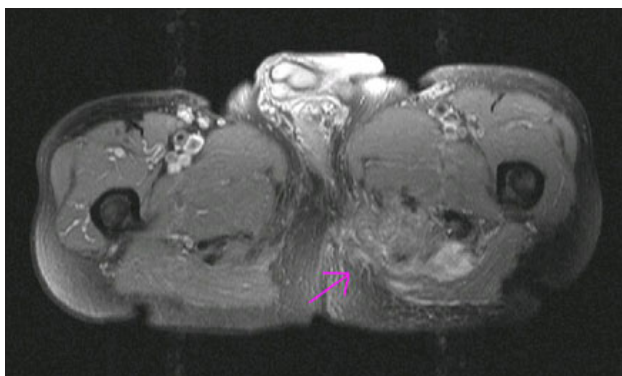


Fig. 3. Grade 5 fistula.

tions for recurrent fistula), but also will not jeopardize stool continence after extensive operation. Key to a successful treatment of perianal fistulas is a correct assessment of the extent of the disease and its relationship to sphincter complex. Additional examinations may give necessary information. Classical method is rectoscopy (eventually colonoscopy) with instillation of hydrogen peroxide or dye for detecting inner fistula opening.

Endoanal ultrasonography has good results, especially when used in complex fistulas (3). A remaining problem is to identify the external sphincter and to differentiate between the scar tissue and fistula canal. Cafaro and Onfrio (1) present 7.2 % of positive findings in scar tissue. Hydrogen peroxide instillation may improve USG fistula visualisation. Unfortunately, our hospital does not have access to rotating endorectal ultrasonography probe.

CT imaging has not an advantage over other imaging methods.

The first presentation of MRI use was in patients with Crohn disease with multiple abdominopelvic fistula variations (4).

MRI may be helpful in estimation of anatomical relationship to anal sphincter and other structures (10). When comparing endorectal MRI and MRI with use of external coil, endorectal study has better outcomes with a significance rate of up to 100 %. Disadvantage of endorectal MRI are the costs because endorectal MRI coil is for single use only.

In the light of the presented information, an optimal method is MRI with external coil. It is minimally invasive, painless, has 92 % sensitivity and is financially bearable. It seems, that sensitivity is better in diagnosis of high and complex fistulas, rather

Tab. 4. St James's University Hospital MR Imaging Classification of Perianal Fistula.

Grade	Description
0	Normal appearance
1	Simple linear intersphincteric fistula
2	Intersphincteric fistula with intersphincteric abscess or secondary fistulous track
3	Trans-sphincteric fistula
4	Trans-sphincteric fistula with abscess or secondary track within the ischioanal or ischiorectal fossa
5	Supralelevator and translevator disease

Tab. 5. Clinical material and results.

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Number	Sex	Operative finding	MRI
1	M	Intersphincteric incomplete	not done
2	M	Transsphincteric	not done
3	F	Extrasphincteric – suprasphincteric	grade 4–5
4	M	Transsphincteric complete	no done
5	M	Intersphincteric + fibrosis after abscess	grade 1
6	F	Transsphincteric – „horse shoe“	grade 3
7	M	Transsphincteric – „horse shoe“	grade 3
8	F	Intersphincteric	grade 2
9	F	Transsphincteric with abscess	without finding
10	M	Transsphincteric with abscess	grade 3
11	M	Intersphincteric complete	without finding
12	M	Intersphincteric complete	grade 1
13	M	Suprasphincteric with abscess	grade 5
14	M	Intersphincteric	grade 1
15	M	Transsphincteric with abscess	not done
16	M	Intersphincteric complete	grade 1
17	M	Transsphincteric with abscess	not done
18	F	Intersphincteric with abscess	grade 2
19	M	Intersphincteric incomplete	grade 1

Tab. 6. Possibilities of surgical therapy.

Fistulotomy – single stage
– multiple stage
Anorectal mucosal advancement flap
Dermal island advancement flap
Seton – cutting
– noncutting
– draining (Crohn disease)
Fibrin glue filling of the tract
York-Mason posterior transsphincteric approach
Fistulectomy

than low and simple fistulas (5). In our group, two fistulas were not confirmed on MRI (one transsphincteric and one intersphincteric). A couple of problems remain in interpretation:

- 1) neural and vascular structures may be considered as a fistula canal,
- 2) issues with visualisation of fat, pus and granulation tissue.

Application of contrast medium, described by some authors (8) eliminates noninvasivity and comfort of native MRI.

According to a metaanalysis, MRI is an optimal technique for differentiation of complex and simple perianal fistula, and endorectal ultrasound exceeds clinical examination and should be used, when MRI is unavailable. (9)

## Conclusion

1) We consider our results as preliminary, because of the small amount of patients. We will continue in prospective analysis.

2) MRI may be useful in successful treatment of perianal fistulas by correct assessment of the extent of disease and relationship to sphincter complex.

3) It is necessary to consider cost-effectiveness when indicating MRI. Decision has to be made, whether it is better to treat recurrent fistula or perform MRI.

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