

Magnetic Resonance Imaging of Perianal Crohn's Disease: Where Do We Stand?

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Perianal disease is encountered in 30 - 50% of patients with Crohn's disease [1]. It is a particularly invalidating disease that usually needs an invasive surgery [2-4]. The most common symptoms are anal pain and incontinence, with an enormous impact on social life of these patients [5].

In clinical practice, the gold standard technique in the evaluation of perianal Crohn's disease is surgical examination under anesthesia (EUA). This examination is particularly invasive for the patient and it does not allow a complete assessment of complex and branched fistulas, that penetrate into the ischioanal fossa and levator ani.

Endoanal ultrasound, instead, is a less invasive approach for the assessment of perianal Crohn's fistulas but it is limited by the small field of view and by the necessity of injecting hydrogen peroxide for evaluating their track.

Another approach is represented by transperineal ultrasound. This examination should be considered as an extension of the physical surgical examination due to the low spatial and contrast resolution.

The introduction of MRI in the clinical practice allowed to overcome the limits of x-ray fistulography and CT, that should be considered obsolete and of low utility. MRI has an elevated contrast resolution that allow to identify both the origin of the fistula in the anal canal and to follow its path in regard of the intersphincteric space and the ischioanal fossa [6].

Recent ECCO guidelines confirm the highest accuracy of MRI compared to EUA in the detection of perianal fistulas [7].

Moreover, most recent MR scanners do not any endorectal coils. Although the use of these latters increases contrast resolution, it is affected by low spatial resolution; thus, more complex fistulas that penetrate into the ischioanal fossa are less evaluable.

Actually, MRI study of perianal fistulas is mandatory in the clinical and surgical study of patients with Crohn's disease. The radiologist has the role of identifying the internal orifice, the main track, the branches and the distal orifice for each fistula. In regard of this, Park's classification [8] should be considered as radiologists' reference (Table 1). It distinguishes perianal fistulas in 4 types according to the relationship between the internal orifice of the fistula and the wall and muscular layers of the anal canal. However, in order to have a complete description of perianal fistulas, Park's classification needs to be combined with the American Gastroenterological Association (AGA) classification that distinguishes simple and complex fistulas (Table 2).

By combining these two classifications, it is possible to completely and accurately report both the path and the complexity of fistulas, with significant clinical impact in patient's management. However, MR exam is not particularly good in grading disease activity [7]. Finally, in the description it is mandatory to indicate if any set on had been previously placed and the presence of any abscess.

Type	Description	Frequency
Intersphincteric fistula	are fistula confined to the intersphincteric space and internal sphincter. They result from perianal abscesses.	≈70
Transsphincteric fistula	are the result of ischiorectal abscesses, with extension of the tract through the external sphincter; they cross both internal and external sphincters.	25
Suprasphincteric	are the result of supraleator abscesses. They pass through the levator ani muscle, over the top of the puborectalis muscle, and into the intersphincteric space, without relationship with anal sphincter.	5
Extrasphincteric	bypass the anal canal and sphincter mechanism, passing through the ischiorectal fossa and levator ani muscle, and open high in the rectum	1

Table 1: Park's classification of perianal fistula in CD.

Type	Description
Simple fistula	are low fistula including superficial, intersphincteric, or intrasphincteric fistulas below the dentate line, with a single external opening, and are characterized by the absence of perianal complications,
Complex fistula	are high, arriving above the dentate line, with many external openings, and may be associated with perianal abscesses, rectal stricture, proctitis, or connection with the bladder or vagina.

Table 2: AGA classification of perianal fistula in CD.

Regarding the technical side of MR examination, it is mandatory to perform a dedicated technique, with high resolution sequences, small FOV and images with high signal/noise ratio. It is not needed any patient preparation prior to the exam.

MRI protocol requires firstly an axial not fat suppressed T1-weighted sequence for an anatomical view of perianal region. Thereafter, fat suppressed T1- and T2- weighted sequences in the axial and coronal planes. Sagittal images are often of low utility except when anovaginal or anovesical fistulas are suspected [8]; indeed, in the majority of the cases, the main track of a fistula is located on the sagittal plane and its thickness, which is often of few millimetres, does not allow an adequate assessment on this plain plane.

Contrast medium should be used only when malignancy is suspected since it does not affect diagnostic accuracy compared to fat suppressed T2-weighted sequence on the axial and coronal planes; these latter allow an optimal assessment of the path of the fistulas and of the inflammatory involvement of the surrounding tissues [10]. Moreover, radiologist may choose to acquire just a coronal STIR in the protocol instead of a coronal T2-weighted sequence.

DWI imaging does not add any particular information in the radiological assessment of perianal fistulas, allowing just their identification, while to date it has no role in grading disease activity [11].

Finally, in complex cases it is possible to use a coronal heavily T2-weighted pulse sequence with slab thickness of few millimetres (cholangiography sequence) with MIP reconstruction in order to have a panoramic view of fistulae and collections.

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