



# What Does Puborectalis Muscle Involvement on Magnetic Resonance Imaging Indicate in Patients With Complex Anal Fistula?

Sung Uk Bae

Department of Surgery, Keimyung University Dongsan Medical Center, Keimyung University School of Medicine, Daegu, Korea

See Articles on Page 51-57

Perianal fistula, defined as an abnormal tract between the anal canal and the perineal skin, is an unusual occurrence that causes serious morbidity and predominantly affects young male adults. It is believed that most perianal fistulas are idiopathic in nature, which can be theoretically explained by the cryptographic hypothesis. Complicated fistula disease includes multiple fistulas, presence of an abscess, or rectovaginal fistula, and generally requires a surgical referral for assessment.

Precise preoperative classification is essential because if the fistula is not properly evaluated, simple fistulas may develop into complex fistulas, and sepsis may recur if secondary expansion is not recognized. Certain diagnostic tools can be used to evaluate anal fistulas. Fistulography is a convenient and economical investigation, but its accuracy is limited [1]. Recent studies using multiplanar reconstructive computed tomography (CT) scans have demonstrated efficacy in evaluating anorectal abscesses, although assessment of perianal fistulas by CT scans is limited by the inadequate tissue contrast agents [2, 3]. Endoscopic ultrasound is also an effective method of evaluating anal fistulas, but previous comparative studies have reported that its efficacy is inferior to that of magnetic resonance imaging (MRI) [4, 5]. Since the first reports on MRI accuracy in assessing anal fistulas published in 1992, MRI has proven to play an important role in the evaluation of perianal

fistulas and is now considered the standard method [6]. In this issue of *Annals of Coloproctology*, the study by Jeong et al. [7] highlights the importance of the puborectalis muscle involvement on MRI in patients with complex fistula.

Several studies have reported a sensitivity and specificity of MRI ranging from 80% to 100% in the classification of anal fistula, as well as providing other clinical information including accurate localization of internal and external openings, presence of secondary ducts and perianal abscess formation, and identification of horseshoe fistulas [8, 9]. Jeong et al. [7] confirmed the remarkably high sensitivity and specificity of MRI in diagnosing fistula tracts of anal fistula and identifying the internal opening. Its sensitivity and specificity in diagnosing fistula tracts and identifying the internal opening were 94.8% and 98.2% and 93.9% and 97.3%, respectively. Moreover, MRI has been shown to change decisions regarding surgical methods and affect the surgical outcomes, and MRI-guided surgery can significantly reduce postoperative recurrence in complex fistulas [10]. Buchanan et al. [11] reported the therapeutic impact and consequent beneficial effect of preoperative MRI in patients with recurrent fistulas and found that postoperative recurrence was 16% in those who underwent preoperative MRI and 57% in those who did not. Additionally, of the 16 patients requiring additional unplanned surgery, MRI accurately predicted the recurrent disease sites in all cases.

Imaging of the puborectalis muscle extension is important, as its position above the pelvic floor makes it difficult for the surgeon to detect it and poses specific difficulties during treatment. Garg [12] assessed the MRI scans of patients in whom the supralelevator extension was confirmed on MRI and demonstrated that it was not possible to predict the supralelevator extension of fistulas based on physical examination alone, and it could be confirmed only after an MRI scan. Jeong et al. [7] analyzed 35 patients with puborectalis muscle involvement on MRI according to the surgical procedure and demonstrated that the involvement of this muscle was a valuable indicator of complex fistula with a variety of clinical features, and a tailored surgical treatment plan should be established. Furthermore, they recommended a sphincter-saving procedure

Correspondence to: Sung Uk Bae, M.D.

Department of Surgery, Keimyung University Dongsan Medical Center, Keimyung University School of Medicine, 56 Dalseong-ro, Jung-gu, Daegu 41931, Korea

Tel: +82-53-250-7322, Fax: +82-53-250-7322

E-mail: [hispower@dsmc.or.kr](mailto:hispower@dsmc.or.kr)

ORCID: <https://orcid.org/0000-0002-7876-4196>

© 2021 The Korean Society of Coloproctology

This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

for complex fistula cases with puborectalis muscle involvement.

It is known that MRI assessment of the perianal region is invaluable for assessing the anal canal for perianal fistulas, and clinical implications of the involvement of the puborectalis muscle in complex fistula cases are important for customized surgical treatment. Recent publications, including Jeong et al's study [7] on this issue, should be considered as an indication of MRI being the gold standard method for evaluating perianal fistula. Moreover, a consensus regarding the imaging guidelines for patients with complex fistula is required.

### CONFLICT OF INTEREST

No potential conflicts of interest relevant to this article were reported.

### REFERENCES

1. Kuijpers HC, Schulpen T. Fistulography for fistula-in-ano. Is it useful? *Dis Colon Rectum* 1985;28:103-4.
2. Ortega AE, Cologne KG, Shin J, Lee SW, Ault GT. Treatment-based three-dimensional classification and management of anorectal infections. *World J Surg* 2017;41:574-89.
3. Halligan S. Imaging fistula-in-ano. *Clin Radiol* 1998;53:85-95.
4. Maier AG, Funovics MA, Kreuzer SH, Herbst F, Wunderlich M, Teleky BK, et al. Evaluation of perianal sepsis: comparison of anal endosonography and magnetic resonance imaging. *J Magn Reson Imaging* 2001;14:254-60.
5. Buchanan GN, Halligan S, Bartram CI, Williams AB, Tarroni D, Cohen CR. Clinical examination, endosonography, and MR imaging in preoperative assessment of fistula in ano: comparison with outcome-based reference standard. *Radiology* 2004;233:674-81.
6. Lunniss PJ, Armstrong P, Barker PG, Reznek RH, Phillips RK. Magnetic resonance imaging of anal fistulae. *Lancet* 1992;340:394-6.
7. Jeong HY, Song SG, Nam WJ, Lee JK. Puborectalis muscle involvement on magnetic resonance imaging in complex fistula: a new perspective on diagnosis and treatment. *Ann Coloproctol* 2021;1:51-7.
8. Beets-Tan RG, Beets GL, van der Hoop AG, Kessels AG, Vliegen RF, Baeten CG, et al. Preoperative MR imaging of anal fistulas: does it really help the surgeon? *Radiology* 2001;218:75-84.
9. Mahjoubi B, Haizadch Kharazi H, Mirzaei R, Moghimi A, Changizi A. Diagnostic accuracy of body coil MRI in describing the characteristics of perianal fistulas. *Colorectal Dis* 2006;8:202-7.
10. Bevans DW Jr, Westbrook KC, Thompson BW, Caldwell JT. Perirectal abscess: a potentially fatal illness. *Am J Surg* 1973;126:765-8.
11. Buchanan G, Halligan S, Williams A, Cohen CR, Tarroni D, Phillips RK, et al. Effect of MRI on clinical outcome of recurrent fistula-in-ano. *Lancet* 2002;360:1661-2.
12. Garg P. Understanding and treating supralelevator fistula-in-ano: MRI analysis of 51 cases and a review of literature. *Dis Colon Rectum* 2018;61:612-21.