MR Imaging Classification of Perianal Fistulas and Its Implications for Patient Management

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Until recently, imaging had a limited role in the preoperative assessment of perianal fistulas. Magnetic resonance (MR) imaging has been shown to demonstrate accurately the anatomy of the perianal region. In addition to showing the anal sphincter mechanism, MR imaging clearly shows the relationship of fistulas to the pelvic diaphragm (levator plate) and the ischiorectal fossae. This relationship has important implications for surgical management and outcome and has been classified into five MR imaging–based grades. If the ischioanal and ischiorectal fossae are unaffected, disease is likely confined to the sphincter complex (simple intersphincteric fistulization, grade 1 or 2), and outcome following simple surgical management is favorable. Involvement of the ischioanal or ischiorectal fossa by a fistulous track or abscess indicates complex disease related to trans-sphincteric or suprasphincteric disease (grade 3 or 4). Correspondingly more complex surgery may be required that may threaten continence or may require colostomy to allow healing. If the track traverses the levator plate, a translevator fistula (grade 5) is present, and a source of pelvic sepsis should be sought.

Abbreviation: STIR = short-inversion-time inversion recovery

Index terms: Anus, MR, 757.12141 • Fistula, anal, 757.245


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2RSNA, 2000

See the commentary by Taylor.
Introduction
Perianal fistulization is an uncommon but important condition of the gastrointestinal tract that causes substantial morbidity. Perianal fistulas occur in approximately 10 of 100,000 persons, with a twofold to fourfold male predominance. Although anal fistulas were known to Hippocrates and have been described throughout the centuries, they began to receive special attention in the 19th century. In 1835, Frederick Salmon founded the Benevolent Dispensary for the Relief of the Poor Afflicted with Fistula, Piles, and Other Diseases of the Rectum and Lower Intestines—the now world famous St Mark’s Hospital—in London. Much of our understanding of perianal fistulas comes from the work of surgeons at St Mark’s Hospital: Salmon, who operated on Charles Dickens; Goodsall, who described the course of fistulous tracks from the skin to the anus (1); and Parks, whose classification of fistulas in relation to anal anatomy is widely used in surgical practice (2).

Goodsall (1) described the relationship of the cutaneous opening to the expected site of the enteric opening. The rule states that cutaneous openings anterior to the transverse anal line are associated with direct radial fistulous tracks into the anal canal, whereas openings posterior to the line have tracks that enter the canal in the midline posteriorly. The cutaneous opening is evident to the surgeon and thus of little importance for the radiologist to demonstrate. The surgeon passes blunt probes along the track from the cutaneous opening and may determine the enteric opening of the fistula at proctoscopy. The challenge in the management of fistulas is to define the course of the track between these openings so that the appropriate surgical option can be used.

Until recently, imaging had a limited role in the preoperative assessment of perianal fistulas. Magnetic resonance (MR) imaging has been shown to demonstrate accurately the perianal anatomy. In this article, we review the anatomy of the perianal region, causes of perianal fistulas, and surgical management; previous methods for preoperative assessment; and useful MR imaging protocols for this evaluation. We then describe an MR imaging–based grading system for perianal fistulas (the St James’s University Hospital classification) that has been validated by surgically proved cases with documented long-term outcome. Management implications of the use of preoperative MR imaging are also discussed.

Anatomy, Causes, and Surgical Management
Anatomy of the Anal Region
Surgeons describe the site and direction of fistulous tracks by referring to the “anal clock” (Fig 1); that is, the view of the anal region with the patient in the lithotomy position. The anterior perineum (p) is at the 12 o’clock position, and the natal cleft (n) is at the 6 o’clock position; 3 o’clock refers to the left lateral aspect, and 9 o’clock, the right lateral aspect of the anal canal. This schema exactly corresponds to the orientation of axial MR images of the perianal region.

Figure 1. Drawing illustrates the anal clock, which is the surgeon’s view of the perianal region when the patient is in the lithotomy position. The anterior perineum (p) is at the 12 o’clock position, and the natal cleft (n) is at the 6 o’clock position; 3 o’clock refers to the left lateral aspect, and 9 o’clock, the right lateral aspect of the anal canal. This schema exactly corresponds to the orientation of axial MR images of the perianal region.

Anatomy, Causes, and Surgical Management
Anatomy of the Anal Region
Surgeons describe the site and direction of fistulous tracks by referring to the “anal clock” (Fig 1); that is, the view of the anal region with the patient in the lithotomy position usually used for fistula surgery. At 12 o’clock is the anterior perineum and at 6 o’clock, the natal cleft; 3 o’clock refers to the left lateral aspect, and 9 o’clock, to the right of the anal canal. Fortunately, these descriptions correspond exactly with the view of the anal canal on axial MR images, and it is helpful for surgical colleagues if the radiologists relate the MR imaging findings to the anal clock.

To understand the surgical options for treating fistulous disease, one must first consider the anatomy and function of the anal sphincters and the causes of perianal fistulas (Figs 2, 3). The internal sphincter is involuntary and is composed of smooth muscle continuous with the circular smooth muscle of the rectum. It is responsible for 85% of resting anal tone. In most individuals, it can be divided without causing a loss of continence. The external sphincter is composed of striated muscle and is continuous superiorly with the puborectalis and levator ani muscles. It contributes only 15% of resting anal tone, but its strong voluntary contractions resist defecation. A division of the external sphincter can lead to incontinence.
Causes of Perianal Fistulas

Idiopathic fistulas are generally believed to represent the chronic phase of intramuscular anal gland sepsis (ie, the cryptoglandular hypothesis). However, perianal fistulas may also be caused by other conditions and events, including Crohn disease, tuberculosis, trauma during childbirth, pelvic infection, pelvic malignancy, and radiation therapy. Anal glands lie at the level of the dentate line in the midanal canal and can penetrate the internal sphincter to lie in the intersphincteric plane. From this space, the infection may track down the intersphincteric plane to the skin, and about 70% of fistulas behave in this way. Alternatively, infection may pass through both layers of the anal sphincter (trans-sphincteric fistulization) to enter the ischiorectal fossa; this development pattern occurs in about 20% of cases.

Abscess cavities may develop along the course of fistulous tracks. Characteristically, the abscesses associated with intersphincteric fistulas are perianal or indeed encysted within the intersphincteric space. Trans-sphincteric fistulas are typically associated with ischiorectal fossa abscesses. In rare cases, infection tracks upward over the sphincter complex to enter the ischiorectal fossa (suprasphincteric fistulization). Sepsis arising within the pelvis may track down to the skin through the ischiorectal fossa, resulting in fistulas that are referred to as extrasphincteric or translevator.

Surgical Approaches

Surgical management of perianal fistulas depends on the nature of the primary fistula and any secondary fistulous tracks or associated abscesses. For simple intersphincteric fistulas, the surgeon performs a fistulotomy or fistulectomy, in which the internal sphincter is divided to lay open the track. Alternatively, in patients with perianal abscess, the surgeon performs a simple incision and drainage first. Fortunately, the majority of fistulas are of this type. More complex disease
provides a challenge for the experienced colorectal surgeon and can be treated with several different approaches, the discussion of which is beyond the scope of this article.

Preservation of fecal continence is the paramount consideration, and treatment strategies aim to preserve the integrity of the external sphincter. Over the years, surgeons have been acutely aware of the damage to their reputations that has resulted from rendering patients incontinent. Surgical papers abound with quotes, such as “if this ring be cut, loss of control surely follows” (3).

Preoperative Evaluation of Perianal Fistulas

The objectives in performing and interpreting any imaging study for perianal fistulas are simple:

1. To determine the relationship of any fistulous track to the sphincter complex. Is the sphincter involved, does the track traverse both layers of the sphincter (trans-sphincteric) or only the internal sphincter (intersphincteric)?

2. To identify any secondary fistulous tracks and the sites of any abscess cavities. Failure to detect and eradicate these may lead to relapse and thus therapeutic failure. Secondary tracks or ramifications may be found within the intersphincteric plane, the ischiorectal fossa, or the suprarectal space. “Horseshoe” tracks may pass circumferentially in these planes and may cross the midline.

Until very recently, surgeons have operated without preoperative imaging, and the finger of the experienced surgeon has held sway in the assessment of perianal fistulization. Before MR imaging was used in the classification of perianal fistulas, the surgical approach was determined from clinical findings derived from a combination of digital rectal examination, proctosigmoidoscopy, and surgical exploration performed with anesthesia with or without probing.

Various imaging techniques have failed to surpass the accuracy of clinical examination. Fistulography is the most traditional of the radiologic techniques used to define the anatomy of fistulas. However, it is also the most unreliable and difficult to interpret (4,5). Because the sphincter complex is not directly visualized, its position and that of the levator ani sling must be inferred. Thus, it is difficult to distinguish, for example, between an abscess high in the ischiorectal fossa and one low in the suprarectal space. Secondary fistulous tracks often fail to fill with contrast material, and the level of the internal opening in the anal canal is difficult to visualize because of the absence of precise anatomic landmarks.

Anal endosonography, while promising much, has also proved inferior to expert clinical assessment (6). The sphincter mechanism and intersphincteric plane are usually well visualized with endosonography, but the external sphincter can be difficult to assess in some individuals. In addition, infection cannot be distinguished from fibrosis with this technique, and insufficient depth penetration results in a failure to identify secondary ramifications and more distant sepsis.

Computed tomography, performed with rectally and intravenously administered contrast media, also showed some early promise (7,8). However, the attenuation values for the sphincters, levator ani, fibrotic fistulous tracks, and active fistulas are so similar that it is difficult to characterize these structures accurately, unless the track contains gas or leaked contrast material.

The role of MR imaging in the diagnosis of perianal fistulas and their complications is emerging. The MR imaging appearance of this condition shows greater concordance with surgical findings than does any other imaging evaluation (9,10). Many different MR imaging techniques have been described (Table 1). MR imaging in the coronal and axial planes demonstrates fistulous tracks in relation to the sphincter complex, ischiorectal fossa, and levator plate. Imaging in the sagittal and oblique planes is helpful in selected cases (eg, anovaginal or presacral disease).

MR imaging examinations performed with a body coil require no patient preparation and are

<table>
<thead>
<tr>
<th>Table 1</th>
<th>MR Imaging Pulse Sequences Used for Perianal Fistula Assessment</th>
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<tbody>
<tr>
<td>Pulse Sequence</td>
<td>Reference</td>
</tr>
<tr>
<td>Short-inversion-time inversion recovery (STIR)</td>
<td>9</td>
</tr>
<tr>
<td>Gradient-echo T1-weighted with or without gadolinium-based intravenous contrast material</td>
<td>10</td>
</tr>
<tr>
<td>Fast spin-echo T2-weighted with fat suppression pulse sequences</td>
<td>11</td>
</tr>
<tr>
<td>Spin-echo T1-weighted</td>
<td>12</td>
</tr>
<tr>
<td>Spin-echo T2-weighted with saline instillation (MR fistulography)</td>
<td>13</td>
</tr>
</tbody>
</table>
Figure 4. Normal perianal anatomy. Coronal T1-weighted (a) and axial T2-weighted (b) MR images show the normal anatomy of the perianal region. \( a = \) anal canal, \( es = \) external sphincter, \( iaf = \) ischioanal fossa, \( irf = \) ischiorectal fossa, \( R = \) rectum, straight arrow in a = the levator plate.

Table 2
MR Imaging Features of Perianal Fistulas and Abscesses

<table>
<thead>
<tr>
<th>Condition</th>
<th>Pulse Sequence</th>
<th>Signal-Intensity Appearance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fistula/edema</td>
<td>T1-weighted</td>
<td>Low/low</td>
</tr>
<tr>
<td></td>
<td>T2-weighted</td>
<td>High/low</td>
</tr>
<tr>
<td></td>
<td>STIR</td>
<td>High/low</td>
</tr>
<tr>
<td></td>
<td>T1-weighted contrast-enhanced</td>
<td>Enhancing/low</td>
</tr>
<tr>
<td>Abscess</td>
<td>T1-weighted</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>T2-weighted</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>STIR</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>T1-weighted contrast-enhanced</td>
<td>Low, with enhancing ring</td>
</tr>
</tbody>
</table>

*The first descriptor refers to the signal intensity of a fistula; the second, to that of edema (eg, low/low = low-signal-intensity fistula and low-signal-intensity edema).

well tolerated. Use of endoanal coils was initially hoped to further improve the MR imaging evaluation of perianal fistulas (14). However, this technique is poorly tolerated in symptomatic patients, and although it provides excellent anatomic detail of the anal sphincters, it fails to provide the overview required for surgical management (15). It seems likely that use of pelvic surface coils may further improve image quality.

MR Imaging of Perianal Fistulas

Normal Anatomy

The anatomy of the perianal region is well demonstrated on coronal and axial MR images (Fig 4). The internal and external sphincters are not separately resolved in normal subjects on MR images obtained with a body coil, but the sphincter complex, ischiorectal fossae, and levator ani muscles are clearly seen.

Techniques for Imaging Perianal Fistulas

Unenhanced T1-weighted images provide an excellent anatomic overview of the sphincter complex, levator plate, and the ischiorectal fossae. Fistulous tracks, inflammation, and abscesses, however, appear as areas of low to intermediate signal intensity and may not be distinguished from normal structures such as the sphincters and levator ani muscles. On T2-weighted and STIR images, pathologic processes including fistulas, secondary fistulous tracks, and fluid collections are clearly depicted (Table 2). They appear as areas of high signal intensity in contrast with the lower signal intensity of the sphincters, muscles, and fat (especially on STIR images). The only comparative study of imaging sequences suggested for use in this condition
showed that STIR imaging has certain limitations (10). In some cases, STIR imaging failed to demonstrate secondary tracks, and in others it did not reveal small residual abscesses within edematous inflammatory change. Furthermore, spurious incidences of high signal intensity in inactive tracks were also observed. Fat suppression techniques used with T2-weighted imaging have also been proposed (11).

We use gradient-echo T1-weighted dynamic intravenous contrast material–enhanced MR imaging combined with T2-weighted imaging to assess perianal fistulas and their complications (10, 16). With use of this technique, active fistulous tracks, secondary ramifications, and abscesses are clearly demonstrated. The tracks brilliantly enhance as do the walls of abscess cavities. Retained pus remains unenhanced, with resulting ring enhancement, an appearance that is typical of abscess formation elsewhere in the body. This breath-hold technique is rapid, noninvasive, and well tolerated, a particular advantage in patients with acutely inflamed perianal regions.

Unenhanced T1-weighted imaging may be helpful in postoperative assessment. First, if MR imaging is performed in the immediate postoperative period, hemorrhage will appear hyperintense and may thus be differentiated from a residual track. Second, fat-containing “grafts” may be placed to fill cavities and resection voids in restorative surgery. These hyperintense structures are readily identified on unenhanced T1-weighted images and can be distinguished from active disease, which appears hyperintense only after enhancement with gadolinium.

Table 3

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>Normal appearance</td>
<td>Fig 4</td>
</tr>
<tr>
<td>1</td>
<td>Simple linear intersphincteric fistula</td>
<td>Figs 5–7</td>
</tr>
<tr>
<td>2</td>
<td>Intersphincteric fistula with intersphincteric abscess or secondary fistulous track</td>
<td>Figs 8–13</td>
</tr>
<tr>
<td>3</td>
<td>Trans-sphincteric fistula</td>
<td>Figs 14–16</td>
</tr>
<tr>
<td>4</td>
<td>Trans-sphincteric fistula with abscess or secondary track within the ischioanal or ischiorectal fossa</td>
<td>Figs 17–22</td>
</tr>
<tr>
<td>5</td>
<td>Supralevator and translevator disease</td>
<td>Figs 23, 24</td>
</tr>
</tbody>
</table>

Source.—Modified from Spencer et al (16).

Figure 5. Grade 1 perianal fistula. (a) Line diagram of the coronal view shows a right intersphincteric fistula (yellow track) extending from the dentate line down to the skin through the intersphincteric plane. (b) Line diagram of the axial view shows the posterior midline intersphincteric fistulous track (yellow spot) confined by the external sphincter.
Although the use of intravenously administered gadolinium produces images that are visually appealing and readily discussed with surgical colleagues, it may not be essential for all cases. We find it most valuable in previously operated cases, especially when there is concern about residual disease activity or abscess formation within postoperative and healing inflammatory tissue. At the time of developing this technique, we could not use fat suppression techniques with our dynamic contrast-enhanced sequences, but with newer MR imaging equipment, we have found these pulse sequences useful.

St James’s University Hospital Classification

MR Imaging
Grading of Perianal Fistulas
Parks et al (2) described the course and relationship of perianal fistulas to the sphincter mechanism with reference to the coronal plane. The MR imaging–based classification used in our institution, the St James’s University Hospital classification, consists of five grades and relates the Parks surgical classification to anatomy seen at MR imaging in both axial and coronal planes (Table 3). Our classification deals not only with the demonstration of the primary fistulous track but also with secondary ramifications and associated abscesses. We believe that this system is easy to use because it utilizes axial anatomic landmarks familiar to radiologists. Its application relies on simple evaluation of this anatomy and robust and reproducible discriminators. Furthermore, the system has been validated in cases with surgical proof (10) and has been shown to correlate better than initial surgical assessment with long-term outcome (16).

Grade 1: Simple Linear Intersphincteric Fistula.—In a simple linear intersphincteric fistula, the fistulous track extends from the skin of the perineum or natal cleft to the anal canal, and the ischiorectal and ischioanal fossae are clear (Figs 5–7). There is no ramification of the track within the sphincter complex. The enhancing track is seen in the plane between the sphincters and is entirely confined by the external sphincter. Fistulous tracks arising behind the transverse anal line, which are by far the most common type, enter the anal canal in the midline posteriorly (Figs 6, 7).

Figures 6, 7. Grade 1 perianal fistula. (6) Coronal dynamic contrast-enhanced MR image shows a right intersphincteric fistula entering the anal canal in the midline posteriorly (arrow). (7) Axial T2-weighted MR image shows a posterior midline intersphincteric fistula (arrowhead).
**Figures 8, 9.** Grade 2 horseshoe perianal fistula. (8) Line diagram of the axial view shows an intersphincteric horseshoe fistula (yellow track, arrow) confined by the external sphincter. (9) Axial T2-weighted image shows an intersphincteric horseshoe fistula (arrow).

**Grade 2: Intersphincteric Fistula with Abscess or Secondary Track.**—Intersphincteric fistulas with an abscess or secondary track are also bounded by the external sphincter. Secondary fistulous tracks may be of the horseshoe type, crossing the midline (Figs 8, 9), or they may ramify in the ipsilateral intersphincteric plane (Figs 10, 11). Even when there is abscess formation, this process is confined within the sphincter complex regardless of imaging plane or sequence (Fig 12).

On T2-weighted images, pus has high signal intensity and thus cannot be reliably distinguished from edema and inflammation, but gas within abscesses has a low signal intensity similar to that of the anorectal lumen (Fig 13). Intersphincteric abscesses and secondary fistulous tracks are well shown by dynamic contrast-enhanced MR imaging. On these contrast-enhanced images, the pus in the central cavity has low signal intensity and is surrounded by a brightly enhancing rim (Figs 11, 12). A horseshoe fistula, in which the process extends to the opposite side, is best demonstrated in the axial plane (Figs 10, 12b).
Figure 14. Grade 3 perianal fistula. Line diagram of the coronal view shows a right trans-sphincteric fistula (yellow track) crossing the ischiorectal fossa and piercing both layers of the sphincter complex.

Grade 3: Trans-sphincteric Fistula.—Instead of tracking down the intersphincteric plane to the skin, the trans-sphincteric fistula pierces through both layers of the sphincter complex and then arcs down to the skin through the ischiorectal and ischioanal fossae (Fig 14). Thus, a trans-sphincteric fistula may disrupt the normal fat of the ischiorectal and ischioanal fossae with secondary edema and hyperemia (Figs 15, 16). These fistulas are distinguished by the site of the enteric entry point in the middle third of the anal canal (ie, corresponding to the position of the dentate line), as seen on coronal images. Because these fistulas disrupt the integrity of the sphincter...
Figures 15, 16. Grade 3 perianal fistula. (15) Coronal dynamic contrast-enhanced MR image shows a right trans-sphincteric fistula (arrow) and inflammatory change in the right ischiorectal fossa. Note the entry site in the middle third of the anal canal. (16) Axial dynamic contrast-enhanced MR image shows a left trans-sphincteric fistula within the ischiorectal fossa and piercing the external sphincter (arrow).

Figures 17, 18. Grade 4 perianal fistula with an ischiorectal fossa abscess. (17) Line diagram of the coronal view shows a left trans-sphincteric fistula with a left ischiorectal fossa abscess (a). (18) Coronal dynamic contrast-enhanced MR image shows a left trans-sphincteric fistula (arrow) with a left ischiorectal fossa abscess (arrowheads) containing nonenhancing pus. Note the contraction of the ischiorectal fossa.

mechanism, their tracks must be excised by dividing both layers of the sphincter, thus risking fecal incontinence.

Grade 4: Trans-sphincteric Fistula with Abscess or Secondary Track within the Ischiorectal Fossa.—A trans-sphincteric fistula can be complicated by sepsis in the ischiorectal orischioanal fossa (Figs 17, 18). Such an abscess may manifest as an expansion along the primary track or as a structure distorting or filling the ischiorectal fossa. Axial and coronal dynamic contrast-enhanced MR imaging clearly depicts a trans-sphincteric abscess, which characteristically has a central focus of low-signal-intensity pus (Figs 18–20). As with grade 3 lesions, the key anatomic discriminator of a grade 4 fistula is the track crossing the external sphincter (Figs 21, 22).
Figures 19, 20. Grade 4 perianal fistula with an abscess. (19) Line diagram of the axial view shows a left trans-sphincteric fistula and left ischioanal fossa abscess (a). (20) Axial T2-weighted (a) and dynamic contrast-enhanced (b) MR images show a left trans-sphincteric fistula (straight arrow) with a left ischioanal fossa abscess (curved arrow) and nonenhancing pus in the cavity (arrowhead).

Figures 21, 22. Grade 4 perianal fistula with an abscess. (21) Line diagram of the axial view shows intersphincteric and ischioanal fossa components of the abscess (a). (22) Axial T2-weighted MR image shows a left trans-sphincteric fistula (straight arrow) with intersphincteric and left ischioanal fossa components of the abscess (curved arrows).
The track or its associated abscess clearly involves the ischiorectal or ischioanal fossa. In some cases, the track assumes a “dumbbell” configuration spanning the external sphincter (Fig 22).

**Grade 5: Supralevator and Translevator Disease.**—In rare cases, perianal fistulous disease extends above the insertion of the levator ani muscle. Suprasphincteric fistulas extend upward in the intersphincteric plane and over the top of the levator ani to pierce downward through the ischiorectal fossa. Extrasphincteric fistulas reflect extension of primary pelvic disease downward through the levator plate (Fig 23). These fistulas pose problems for management because further assessment is needed to detect pelvic sepsis. Coronal dynamic contrast-enhanced MR imaging elegantly demonstrates breaches of the levator plate, which is clearly shown in this plane. In some translevator fistulas, horseshoe ramifications to the contralateral side may occur (Fig 24).

**Clinical Experience with the Classification and Its Implications for Patient Management**

We have now studied more than 300 patients with MR imaging before their initial surgical procedure who had surgically proved fistulas. Initially, patients were operated on without access to the MR imaging findings as part of a prospective double-blind study that showed excellent anatomic and diagnostic performance for MR imaging (10). In addition to this excellent correlation between MR imaging findings and the standard of surgical exploration, we and others noted that early patient outcomes vindicated the imaging findings in discrepant cases (9,10). The MR imaging findings proved correct in cases in which initial surgical exploration failed to reveal fistulas. Surgical exploration may be difficult in the presence of inflammatory swelling or fibrosis. A particular advantage of MR imaging is its ability to demonstrate occult intersphincteric space sepsis (ie, pus is trapped within the intersphincteric space with no cutaneous exit and thus cannot be found by probing) (Figs 11, 12). In cases of “high” fistulas (trans-sphincteric and extrasphincteric, grades 3–5), probing or exploration may be abandoned when anatomic landmarks are uncertain and the operator is unsure whether he or she is above or below the levator plate (Fig 24).

Further work has shown that MR imaging is better than initial surgical exploration in the prediction of patient outcome (16). When the St James’s University Hospital classification was used, the MR imaging grading of fistulas was significantly associated with outcome ($P < .001$): MR imaging grades 1 and 2 were associated with a satisfactory outcome (ie, no further surgery needed), whereas grades 3–5 were associated with unsatisfactory outcome (ie, further surgery needed) (16).
Conclusions

MR imaging has had a major impact on the preoperative assessment of perianal fistulas in centers specializing in their surgery (9,10,15,16). We routinely use the St James’s University Hospital classification, an MR imaging–based grading system validated by surgical exploration and long-term clinical outcome. This classification employs simple anatomic discriminators identifiable on axial and coronal MR images. By using this system, the radiologist can alert the referring clinician to the presence of complex disease that may require expert surgical management. The essential teaching points can be summarized as follows:

1. If the ischioanal and ischiorectal fossae are unaffected at MR imaging, disease is likely confined to the sphincter complex (intersphincteric fistulization, grade 1 or 2). Outcome following simple surgical management is favorable.

2. If there is any track or abscess within the ischiorectal fossa, it is usually related to a complex perianal fistula (typically trans-sphincteric fistulization, grade 3 or 4). Correspondingly more complex surgery may be required that may threaten continence or may require fecal diversion (colostomy) to allow healing. When the track traverses the levator plate, a translevator fistula (grade 5) is present, and a source of pelvic sepsis should be sought.

Acknowledgments: We thank Jane Howard for her assistance in preparation of the manuscript and also the Medical Illustration Department of St James’s University Hospital, particularly Paul Brown and Nicola Ruddock, for their work on the illustrations.

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