

# ANORECTAL ABSCESS AND FISTULA-IN-ANO

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**The etiology of anorectal abscess and fistula-in-ano is discussed. The anatomy, which is vital to the understanding and treatment of the above, is reviewed, with two of the more common classifications of fistula-in-ano presented. The different methods of treating each are discussed, and some of the common complications of the procedure are listed. A true understanding of the disease process and anatomy is needed before treatment of fistulous abscesses is begun, but, with it, successful outcomes will occur in most cases.**

Anorectal diseases have plagued mankind since earliest recorded history. It is safe to assume that among them, anorectal abscesses and anal fistulas have occupied a place of concern. Anorectal abscesses are at once inconvenient, painful, and usually sudden in their occurrence; the natural sequelae of anal fistulas are also considered, since it is generally agreed that the same etiologic factors exist for both disease processes.

The pathogenesis of the anorectal abscess and the subsequent development of fistula-in-ano is contro-

versial. There have been several theories that all represent attempts at explanation. The most cogent theory has a long history of advocacy starting with Chiari<sup>1</sup> in 1878, and then two French anatomists, Hermann and Desfosses,<sup>2</sup> who in 1880 described small glands in the anus that are adjacent to the internal sphincter muscle. These glands were found to occur in the anal canal and to discharge their contents into the anus at the dentate line. It was postulated that infection of these glands was the cause of anal abscesses and fistulas. Many others, including Lockhart-Mummery (1929),<sup>3</sup> Gordon-Watson and Dodd (1935),<sup>4</sup> and Hill, Shryock, and ReBell (1943),<sup>5</sup> reiterated this basic theory.

Kratzer and Dockerty,<sup>6</sup> in 1947, examined over 100 anatomical specimens histologically and found that in 55 percent of the specimens anal glands were found, and in 33 percent of the dissections the glands were found to penetrate the internal sphincter. Unfortunately, Kratzer and Dockerty did not perform serial sections of the specimens. Dunphy<sup>7</sup> also postulated that anal glandular infection was the cause of abscess and fistula. Eisenhammer<sup>8</sup> postulated the anal gland theory of fistula abscess formation and gave an accurate account of its intersphincter location and distribution. He did not provide any histologic confirmation of this theory.

Parks,<sup>9</sup> in 1961, performed a selected study involving 30 consecutive cases of fistula-in-ano in which 90 percent were found to result from infected anal glands. He performed serial sectioning of the surgically removed section of the fistulous track, where he found anal glands in all specimens, and cystic dilatation of these glands was a usual precursor to infection.

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## ETIOLOGY

Etiologic factors that can lead to anal fistulas include tuberculosis, foreign body, ulcerative colitis, and Crohn's disease. Other causes include cancer, actinomycosis, lymphogranuloma venereum, radiation, and leukemia-lymphoma. Traumatic causes of fistulous abscesses include impalement, enemas, prostatic surgery, episiotomy, and hemorrhoidectomy.<sup>10</sup>

## ANATOMY

There are two major muscular groups found in the anorectum. The inner muscle group is circular smooth muscle, which becomes hypertrophied distally and develops into the (involuntary) internal sphincter muscle. This cone-shaped structure is surrounded by a second set of (voluntary) muscles called the external sphincter muscles. Starting distally and advancing into the anal canal, the external anal sphincter is composed of the subcutaneous, superficial, and deep sections, followed by the puborectalis. The puborectalis is also the level of what is anatomically described as the anorectal ring. This anatomic and somatic muscle is important; it has been described as the "key to continence." Transection of the anorectal ring and the puborectalis will lead to anal incontinence. Above the puborectalis lies the levator mechanism (iliococcygeus and pubococcygeus). The space between the internal and external anal sphincter is called the intersphincter plane. This space contains some anal glands. Obstruction of the glands with accumulation of fecal and other foreign debris is felt to represent the necessary combinations of stasis, bacterial accumulation, and chronicity to account for the development of a fistulous abscess. The anatomic spaces where abscesses can track include the intersphincteric, ischiorectal, and the pararectal space above the levators.

## HISTORY AND PHYSICAL EXAMINATION

With anal fistulas as with all other conditions, the cornerstones of any therapeutic endeavors are history and physical examination. Mazier,<sup>11</sup> in a retrospective study of 1,000 fistula-in-ano patients treated between 1961 and 1968, found that historical symptoms of pain, swelling, and drainage were by and large the predominant early symptom complexes. A late and ominous symptom was fever and chills. The fatal potential of untreated or improperly drained fistulous

abscesses is very thoroughly documented by Marks, Chase, and Mervine.<sup>12</sup> They analyze the deaths of 11 patients (from 1962 to 1969) seen at Jefferson Medical College Surgical Service. In all cases inadequate initial therapy followed by patient or physician follow-up delay led to an overwhelming soft tissue and fascial infection that proved fatal. Adequate drainage and debridement remain the standard of care in advanced cases of fistulous abscess. No other therapy, including antibiotics, can be effective until this has occurred.

Physical examination should include anoscopy and sigmoidoscopy. In the case of an acute abscess, however, initial treatment of incision and drainage may need to be accomplished, followed at five to seven days with endoscopic examination of the anus and rectum.

Radiographic examination of fistulous tracks are necessary for well-established or complex fistulas. There is no place for these examinations in the typical uncomplicated fistulous abscess encountered.

## DIFFERENTIAL DIAGNOSIS

The different types of perianal abscesses are Bartholin's gland cyst, sebaceous cyst, hidradenitis suppurative, tuberculosis, and inflammatory bowel disease.

## INCIDENCE

Anorectal abscesses are more common in men than in women by a 2-to-1 ratio. The incidence of fistulas subsequent to an anal abscess is the subject of a 1974 paper by Scoma, Salvati, and Rubin.<sup>13</sup> In their paper a retrospective analysis of 232 patients who had an anorectal abscess and who were followed from six months to 13 years was made. One-hundred fifty-four (66 percent) developed fistula-in-ano, and 78 (34 percent) had no sequelae. Although these numbers are subject to interpretation, they provide reasonable criteria for the surgeon to advise his or her patients of their illness and to direct therapy.

## TREATMENT OF ABSCESS

Incision and drainage is the standard therapy for all anal abscesses. This can usually be performed in an outpatient situation under local anesthesia. After the area is prepared with an antiseptic solution, a cruciate incision is made in the indurated area, with care being taken that the incision is placed as close to the anus as possible. This will reduce the length of any

**TABLE 1. PARKS'S CLASSIFICATION OF FISTULA-IN-ANO<sup>14</sup>**


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I. Intersphincteric
a. Simple low track
b. High blind track
c. High track with rectal opening
d. Rectal opening without a perineal opening
e. Extrarectal extension
f. Secondary to pelvic disease
II. Transsphincteric
a. Uncomplicated
b. High blind track
III. Suprasphincteric
a. Uncomplicated
b. High blind track
IV. Extrasphincteric
a. Secondary to anal fistula
b. Secondary to trauma
c. Secondary to anorectal disease
d. Secondary to pelvic infection

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**TABLE 2. HANLEY'S CLASSIFICATION OF FISTULA-IN-ANO<sup>15</sup>**


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I. Low intermuscular anorectal space (between conjoined longitudinal muscle and the internal sphincter muscles)
Infrlevator anorectal spaces
1. perianal
2. subcutaneous anal space
3. superficial postanal space
4. superficial anterior space
5. deep postanal space (horseshoe)
6. deep anterior anal space (horseshoe)
7. ischiorectal ischioanal spaces
II. High intermuscular abscess
Suprlevator anorectal spaces
1. retrorectal space
2. retrovesicle space
3. pelvirectal space
4. retroperitoneal abdominal cavity space
III. Combined infrlevator and suprlevator spaces and suprlevator pararectal space

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subsequent fistula track and make for easier and safer surgical excision.

Although there is a tendency to probe the abscess cavity with digits and/or instruments, this is unnecessary. Wicking or loosely packing the wound with gauze is useful. However, avoid overpacking the abscess cavity; this may result in pain and a recrudescence of the abscess symptomatology. Sitz baths and a bulk laxative with a nonconstipating pain medication are prescribed. Follow-up is usually obtained in seven to ten days. If the patient has chronic medical problems or is immunologically compromised, or if some other special circumstance exists, the routine procedures described are amended to accommodate the special situation.

### CLASSIFICATION OF FISTULA-IN-ANO

There are several fistula classifications that have been created. Parks's classification<sup>14</sup> is both descriptive and easy to use (Table 1). Hanley's<sup>15</sup> classification also is very thorough and descriptive (Table 2). Both classifications are based on anatomic criteria and are dependent upon the clinician having a solid grasp of anorectal anatomy. Hanley's classification is particularly instructive in its categorization of the many anorectal potential spaces. For purposes of this article,

the Parks classification of fistula-in-ano will be used.

Parks classifies fistulas into several categories. The first category of fistulas is the intersphincter fistula. This category deals only with the intersphincter space. This is the commonest of all types, and is the intermediary form that leads to most other types of fistulas.

There are several types of intersphincter fistulas. The *simple low track* fistula goes from the dentate line through the internal sphincter muscle and courses downward to the anal verge. It is easily treated by laying open the tract. The *high blind track* fistula is identical to the low track fistula, except it tracks upward along the intersphincteric space. Treatment consists of laying open the track and the internal sphincter for as high as the track goes. Little change in continence will occur because the muscle is held together by the fibrotic edges of the fistula track. Failure to recognize and lay open the track to its total extent may lead to recurrence of the fistula. The *high track with rectal opening* is an extension of the previously described fistulas with the fistula breaking into the rectum. This fistula can usually be opened without risk. Experience and careful examination of the track is imperative in order to map the fistulous track course. Electromyographic stimulation of the surrounding external muscles may be helpful in establishing the course and character of a fistula. The *high*

*track without a perineal opening* is a fistula that has no downward course. It begins at the level of the dentate line and travels upward. The most important point to be made regarding this fistula is that the lowest part of the track must be laid open because the primary source of the infection is at this level. The *extrarectal extension* is a very easy abscess to treat if it is recognized as an intersphincteric abscess that has extended upward into the true pelvis. This fistulous abscess should be drained through the rectum. If it is drained through the skin (ischioanal fossa), the subsequent suprasphincteric fistula (which rises above the levator mechanism) will be more difficult to treat. *Fistula secondary to pelvic disease* may present in the perineum, but the primary source of infection is in the pelvis. This is not a true anal fistulous abscess (cryptoglandular), therefore division of muscles is unnecessary.

The next category of fistulas is the transsphincteric fistula. The *uncomplicated* transsphincteric fistula track crosses the internal sphincter, the lower portion of the external sphincter, and into the ischioanal fossa. Usually these fistulas are below the anorectal ring, and transection of the involved muscles will result in little disturbance in sphincter function. Exceptions to this rule are most noticeable in elderly female patients. The *high blind track*, if improperly treated, has catastrophic complications. The key to the proper treatment of this fistula is to recognize the true opening, which occurs at the level of the dentate line. The associated track may extend to the level of the true pelvis. Usually if the primary track is opened, the only other necessity is to allow wide-open drainage of the track. The great fear is to turn this track into an extrasphincter fistula by passing the probe through the rectum.

The third category is the suprasphincteric fistula. The *uncomplicated* suprasphincteric fistula is worrisome and difficult to treat because it extends over the puborectalis and exits through the ischioanal fossa. It usually arises through the midanal canal at the dentate. Treatment can be difficult; staged transections of the muscles involved can be tried. Two principles should be adhered to: (1) obliterate the causative glandular infection, and (2) do not transect the puborectalis. Use of a seton is very prudent in the treatment of these abscesses. The *high blind track* is also difficult to treat, and difficulties are complicated further by extension into the supralevator compartment. Usually this fistulous track will extend in a horseshoe fashion and wrap around the puborectalis. Oblitera-

tion of the track without cutting the puborectalis can usually be accomplished. Identification using milk or methylene blue can be very helpful in delineating the track in its relationship to the normal anatomy.

The final category of fistulas is the *extrasphincteric* fistula. Most extrasphincteric fistulas are a result of iatrogenic injuries. The improper examination of an intersphincteric fistula with random or capricious probing will result in this complicated and difficult fistula. Usually a temporary defunctionalizing colostomy needs to be performed. Other causes of these fistulas include trauma, inflammatory bowel disease, and diverticulitis.

## INCIDENCE OF FISTULAS

Based on Parks's studies of 400 patients, the incidence of fistula was cataloged as intersphincteric (45 percent), transsphincteric (30 percent), suprasphincteric (20 percent), and extrasphincteric (5 percent).

Marks and Ritchie<sup>16</sup> classified 793 nonselected, consecutive patients who were treated at Britain's St. Mark's Hospital from 1968 to 1973. Their incidence of the different categories included intersphincteric (70 percent), transsphincteric (20 percent), suprasphincteric (3 percent), and miscellaneous (4 percent).

Parks<sup>9</sup> felt that his original figures listed were from a selected patient population and that truer numbers regarding the general population would correspond more closely to the numbers derived by Marks and Ritchie.

## COMPLICATIONS

Mazier<sup>11</sup> categorized the complications involved in fistula surgery. High urinary retention rate (25 percent) was reported. Excluding this complication, an overall complication of 5.4 percent was reported. Included were the problems of hemorrhage, incontinence, acute external thrombosed hemorrhoid, cellulitis, inadequate drainage, fecal impaction, recurrent fistula, rectovaginal fistula, and stricture.

The primary cause of a recurrent fistula is failure to find the internal opening or source, which usually occurs at the dentate line. Failure to do this and inadequate drainage of a cavity account for most recurrences.

## SETON

The use of a seton—a nonabsorbent suture that is passed through the fistula and around the involved muscle groups—is based upon the concept of laying open a fistula track without causing gapping of the sphincter muscle. The track opens slowly enough so that fibrosis occurs, thereby supporting the muscle and assuring continence. In conceptualizing this important technique, a useful image is that of a block of ice being placed on piano wires. As the ice block is transected by the wires, there is no loss of continuity of the ice block because refreezing occurs. The block of ice remains intact even though it is transected by the wire. A method that is very useful is to use a rubber band seton, which causes transection of the sphincter by a predetermined pressure dependent upon the amount of muscle that needs to be transected and the amount of tension placed. If this method is used, frequent follow-up visits are necessary to ensure proper therapeutic results.

## SUMMARY

Anorectal abscesses and anal fistulas are disease processes that have their basis of understanding and treatment firmly rooted in the anatomic design of the anal canal. The potential for disastrous complications is real. Careful, thorough, and meticulous care in the diagnosis and treatment of fistulous abscesses will result in successful outcomes in most cases.

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