

## Fistula Cancer \*

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THE OCCASIONAL development of malignant disease in chronic sinuses and fistulous tracts is well recognized. The question of whether or not carcinomatous changes are caused by the prolonged inflammatory reaction in such tracts, however, has not been established so clearly. In 1940, Ewing<sup>2</sup> quoted Kraske's statement, "there is no satisfactory evidence that cancer develops in tissues altered by hemorrhoids, fistulae or cicatrices." A reasonable doubt can often be raised in a given case of whether the fistula or sinus did not arise in a malignant tumor already present. Which preceded which is usually impossible to determine.

Numerous authors have concluded that chronic sinuses and fistulas do of themselves sometimes give rise to malignant changes. Among them are Rosser,<sup>9</sup> Miller and Lypin,<sup>8</sup> and Skir.<sup>10</sup> The latter suggested that the best criteria for determining a causal relationship is the time factor. He arbitrarily set ten years as the period over which a fistula must be present before neoplastic changes develop in it, to prove an etiologic connection between the tumor and the tract. Of 50 cases of fistula cancer which he found in the literature, only 14 met this requirement, plus three which he added. The development of epidermoid carcinoma in a pilonidal sinus, reported by Hall and Lee<sup>4</sup> and in war wounds described by Gillis and Lee,<sup>3</sup> gives added

evidence of the fact that malignant degeneration is not limited to anal fistulas, but can occur in any chronic draining sinus or tract.

### Anal Fistula Carcinoma

Buie described fistula-in-ano as one of the diseases for which surgical treatment has long been performed successfully. In an interesting article he stated that Albuca-sis reported a fistulectomy in 1013 A.D. During the 14th century John of Aderne performed the operation as it is carried out in modern times. Henry V is said to have had an anal fistula which caused his death. Louis XIV underwent fistulectomy twice, the second operation proving successful.

As noted by Miller and Lipin,<sup>8</sup> fistula-in-ano usually develops at the dentate line of the anal canal. Here the upper portion of the canal with its cylindrical cells ends, and the lower squamous cell portion begins. Cancer therefore usually develops at the anorectal line, and may be adenocarcinoma or colloid carcinoma from high rectal fistulas or squamous or occasionally, as noted by Manheim and Alexander,<sup>6</sup> basal cell from more superficial tracts. Since the majority of these tumors are adenocarcinomas, it follows that the much less frequent high level fistulas, with the internal opening above the dentate line provide most of the cases. The occurrence of mucoid carcinomas in fistulas with a low internal opening has been explained by Leblanc and Thompson<sup>5</sup> as due to the penetration of columnar cells into the internal sphincter during embryo-

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\* Presented before the Southern Surgical Association, Boca Raton, Florida, December 9-11, 1958.

logical development. Fistulas and adenocarcinomas can develop from these cells.

### Clinical Course and Treatment

Whenever a fistula-in-ano has been present for many years, the possibility of malignant change in it should be suspected. Indications of the development of carcinoma are the onset of pain, induration or bleeding in an otherwise asymptomatic fistula; or the appearance of mucinous drainage. The appearance of the fistula in the early stages of malignancy is not remarkably different from that of the inflammatory lesion itself. Gradually hard induration develops around the fistulous tract, or a mass may appear near the tract, palpable only under the skin of the perineal region. Rectal examination is usually surprisingly noncontributory and no lesion is visible on proctoscopic visualization of the rectosigmoid area.

**Treatment:** Operative removal of these tumors should be by the abdominoperineal approach, with a particularly wide dissection of the perirectal tissues. Since the lesion invades the levator ani muscles, fascia, subcutaneous tissue and skin, the perineal incision should be wide, extending well beyond the limits of the tumor. The levator ani muscles should be divided as close to their origin as possible. The tumor mass, together with the rectum and an adequate covering of normal tissue, should then be excised en masse to insure complete removal of the lesion.

### Case Reports

Following are six cases of carcinoma which developed in anal fistulous tracts. In five, abdominoperineal resections were performed; in one, local excision only. Four of these patients are well from one to four years postoperatively without evidence of recurrence. One patient died six months after operation. In one, the tumor has been

excised too recently for significant evaluation.

**Case 1.** A 77-year-old negro female was hospitalized on May 6, 1958 because of a firm mass in the left perianal area. She stated that a number of years previously she had had an operation for a perianal abscess and that there had been some pain in the region of the scar from time to time thereafter. For the two weeks prior to admission there had been perirectal and perianal pain and the appearance of a mass in the right side of the perineum near the anus. There were no other symptoms.

Physical examination on admission revealed a pulse of 80, respirations 18, B.P. 140/90. General examination of the heart, lungs and abdomen was noncontributory except for general obesity. There was a 6 × 6 cm. nontender right perianal mass which seemed to lie in the subcutaneous tissue. No masses were felt inside the rectum on rectal examination. Urinalysis, hematology and blood chemistry studies were within normal limits.

On May 16, 1958, an open perineal biopsy was performed which showed evidence of adenocarcinoma in the old fistulous tract. Consequently, an abdominoperineal resection of the rectum including the perianal mass was performed. A wide elliptical incision was made about the anus, removing the levator ani muscles near their origin and a wide border of normal tissue en bloc. The pathologic examination of the tissue removed revealed two dimple-like depressions of the skin. A probe introduced into the tract extending from the skin to the rectum could be passed into the tumor mass. A fistulous tract extended from this into an anal crypt. The patient's course was uneventful and when last seen in October 1958 her condition was excellent and there was no evidence of recurrence.

**Case 2.** A 46-year-old negro female was hospitalized on April 14, 1957, with a history of multiple rectal fistulas and perirectal abscesses of two years' duration. She was admitted for a fistulectomy. For two months prior to admission she had noticed a painful nodule in her left buttock which alternately drained and healed. Two weeks prior to admission incision and drainage of a perirectal abscess had been performed in the emergency room of the hospital.

Physical examination revealed a B.P. of 160/100, pulse 100, temperature 37°. The liver edge was palpable two fingers-breadth below the costal margin. Rectal examination revealed edema of the left perianal tissues and a recent incision was present. There were multiple fistulous tracts on the right side. Routine blood studies and urinalysis were

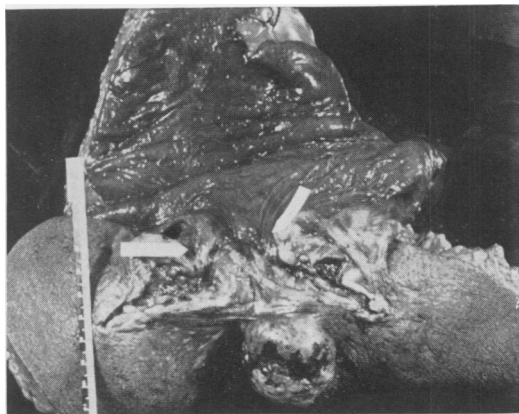
within normal limits. EKG demonstrated left ventricular hypertrophy.

On the day following admission fistulectomy was performed but a large mass was present about the fistulous tract. Microscopic study of this tissue revealed adenocarcinoma arising in a fistulous tract. Therefore, after preparation of the colon with antibiotics, on April 24, 1957, an abdominoperineal resection was performed with removal of the perirectal tissues en masse together with the rectum. The postoperative course was entirely uncomplicated and when last seen in the Surgical Clinic in September 1957, there was no evidence of recurrence.

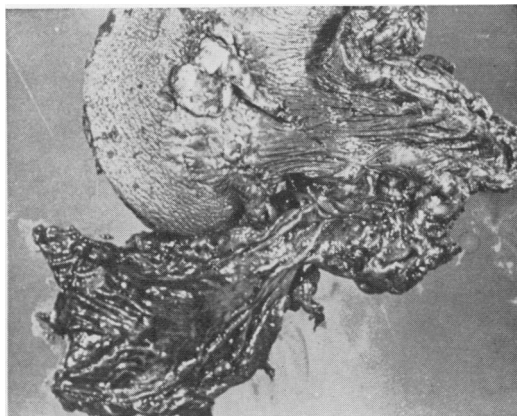
**Case 3.** A 66-year-old colored female was admitted to the hospital on July 15, 1957, for treatment of a mass on her left buttock. She had complained of chronic constipation and hemorrhoids for several years. For the past few weeks she had noted bright red blood on her underclothing. She had developed pain just outside her rectum approximately two weeks before admission and one week before admission had noted a progressively enlarging mass in her left buttock.

On admission the general physical examination was within normal limits. In the anal area, there was a 6 × 8 cm. indurated, fungating mass which bled easily upon contact. Between the mass and the anal opening, the tissue was completely normal. Rectal examination was normal. There was no abnormality in the mucosa of the bowel. Anoscopic and proctoscopic examinations were within normal limits and there was no communication elicited between the mass and the rectum.

A biopsy of the mass proved it to be an adeno-



**FIG. 1.** Adenocarcinoma in anal fistulas. Arrows point to internal openings of two fistulous tracts, which pass through ulcerated tumor mass. (Case 3.)



**FIG. 2.** Epidermoid carcinoma in anal fistula. Papillary lesion in center of buttock marks beginning of fistulous tract which passes into the rectum. (Case 4.)

carcinoma. Accordingly, an abdominoperineal resection was performed with a wide perineal excision. The gross specimen included the rectum and a large portion of the soft tissues about the anus. Upon gross examination the tumor mass did not protrude into the anal canal or rectum. The opened bowel and anus demonstrated normal mucosa and mucous membrane. In transecting the ulcerated tumor mass of the soft tissues of the buttock, it was noted that in the depths there were two tortuous intercommunicating sinus tracts (Fig. 1). A probe inserted into each of these entered the rectum at the mucocutaneous junction. The anal openings of both tracts did not show any malignant tissue. As they were followed distally from the bowel lumen into the tumor mass, it could be seen that the lining of the sinus tract changed from granulation tissue and stratified squamous epithelium to that of adenocarcinoma.

The patient had an uneventful postoperative course and to date is free of any recurrent disease.

**Case 4.** A 41-year-old colored male was admitted to the hospital on October 16, 1958, for the treatment of a draining lesion on the right buttock. Twelve years previously he had developed a tender swelling in this location which was incised and drained in another hospital. Since then he had had intermittent drainage from this area. For the past year there had been a small raised lesion at the draining site on the right buttock.

On physical examination, there was a 2 × 1 cm. raised, papillary-type lesion approximately 3.5 cm. from the anal opening on the right buttock. In the center of this mass there was a sinus tract through

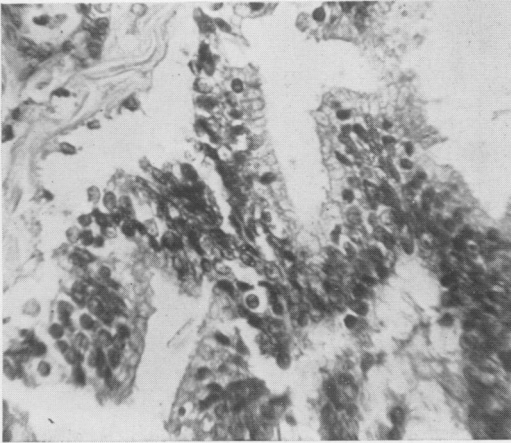


FIG. 3. Adenocarcinoma arising in anal fistulous tract. (Case 6.)

which a probe could be inserted toward the rectum (Fig. 2).

After biopsy, on microscopic examination, the papillary lesion proved to be a low grade epidermoid carcinoma. In the depths of the tissue a completely epithelial lined sinus tract could be seen. Accordingly, the patient was reoperated upon with a wide excision surrounding the previously excised area, an attached wedge extending to the anus, so as to completely excise the fistulous tract. Microscopic examination of this tissue showed a completely epithelized fistula leading from the anus into the soft tissues. Three centimeters from the anus in this fistulous tract there was a small amount of residual epidermoid carcinoma.

**Case 5.** A 33-year-old colored male was admitted to the hospital for the treatment of a perirectal lesion. Approximately three years prior to admission he had gradually developed a rectal stricture and two years prior to admission it was noted that he had a granulating ulcer in his anal canal with extension into the adjacent buttocks. A diagnosis of granuloma inguinale was made on the basis of a positive smear for Donovan bodies. He was given a five-week course of chloromycetin. Since that time he had had persistent drainage from the anal area.

At the time of admission he presented with a small anal ulcer at the base of which there was a fistulous tract leading out into the buttock. Approximately 3 to 4 cm. from the anus there was an indurated area beneath the skin measuring approximately  $2 \times 3$  cm. Biopsies were made of the anal ulcer and also of the indurated mass in the buttock. The anal ulcer proved to be a chronic granuloma

with no Donovan bodies found. The mass in the buttock was an epidermoid carcinoma. Accordingly, an extensive abdominalperineal resection was performed which included resection of the prostate and the seminal vessels, because it was found that the epidermoid carcinoma in the buttock had extended proximally, infiltrating the area about the prostate.

Gross inspection of the specimen revealed the entire bowel mucosa and the anal mucous membrane to be intact with no evidence of malignancy. The anal ulcer was also free of malignancy. At a distance of 4 cm. from the anus the fistulous tract entered the malignant mass. This was very extensive in the soft tissues, and extended to the edges of the resected specimen in the region of the prostate.

Approximately one year later the patient developed a large recurrence in the perineum and about the bladder. He ran a down-hill course and expired approximately six months later.

**Case 6.** A 63-year-old colored male was admitted to the hospital on March 16, 1954, because of a recent cerebral vascular accident. In the process of his admission studies it was noted he had an ulcerated, fungating lesion on the left buttock. This was located approximately 8 cm. from the anal opening, and measured  $3 \times 2$  cm. in its greatest diameter. He stated that he had had intermittent drainage from this area for over 25 years. Rectal examination was completely normal, as was the anoscopic and proctoscopic examinations. A biopsy of the lesion revealed mucoid adenocarcinoma (Fig. 3).

The patient was prepared for surgery and an abdominoperineal resection with a very wide excision of the soft tissues about the anus was performed.

The operative specimen was opened and the entire rectum and anus were normal, without any evidence of malignancy arising from the mucosa or mucous membrane surface. Approximately 6 cm. from the anal orifice there was a  $3 \times 4$  cm. polypoid fungating mass. On sectioning, this extended down into the underlying subcutaneous tissues approximately 2.5 cm. A sinus tract 12 cm. in length was found communicating with the base of this mass and extending to the anal canal. Sections through the tract showed it to be lined by rectal mucosa which was infiltrated with chronic inflammatory cells. In the distal part of the tract, however, were malignant cells similar to those of the main tumor mass.

The patient was last seen in May 1958, and had no evidence of recurrence.

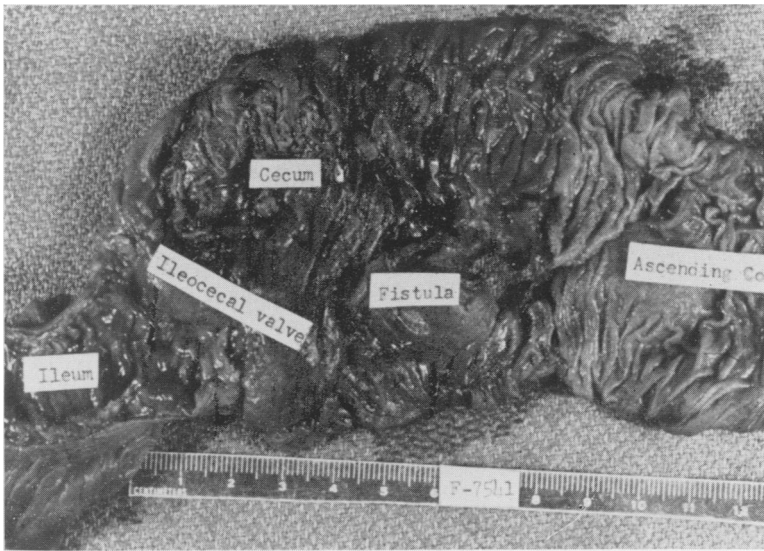


FIG. 4 A. Cecum and ascending colon, with fistulous tract containing epidermoid carcinoma, in patient who had had a nephrostomy fistula for 20 years. (Case 7.)

### Carcinoma in Other Fistulas and Sinuses

The development of malignant changes in other fistulas and sinus tracts has occasionally been reported. Gillis and Lee<sup>3</sup> described 34 cases of carcinoma, usually squamous cell, which appeared from 18 to 31 years after war wounds. Draining sinuses had been present for many years in most of these patients, although in some the scars were completely healed. McAnally and Dockerty<sup>7</sup> reported nine cases of carcinoma in chronic osteomyelitis sinuses, and one in a chronic empyema tract. Hall and Lee<sup>4</sup> encountered a patient with squamous cell carcinoma in a pilonidal sinus of 20 years' duration.

Following are two additional cases of squamous cell carcinoma occurring in chronic draining sinuses of 20 or more years duration. One patient's condition was too poor for complete resection of the tumor mass. She expired six months after a palliative operation. In the other, because of his moribund condition, no operation was performed.

**Case 7.** A 76-year-old white female was hospitalized on October 20, 1957, because of drainage

of fecal material through an old fistulous tract in her right flank.

In 1927, four large kidney stones had been removed from the right kidney. One month later stones were removed from the bladder, and in 1930 a kidney abscess developed in the right flank which was drained. A large stone was removed from the right kidney in 1931. In 1935, another stone was removed from the right kidney and in 1947, an abdominal abscess formed which opened spontaneously. In 1948, a right nephrectomy was performed with the removal of two stones. Following this, however, one stone continued to be visible by x-ray in the right flank. Two operative attempts to remove the stone were unsuccessful. In September 1957, blood and fecal drainage appeared through the fistulous tract which had persisted in the right flank for 20 years.

Physical examination revealed an emaciated white female showing evidence of weight loss. There was a draining fistula emptying through two openings in the right flank. There was a Grade IV apical systolic murmur transmitted throughout the precordium and coarse rales were heard in both lung bases. There was edema of both lower extremities. Blood studies were within normal limits. Urinalysis revealed 2 plus albumin and the urine was loaded with pus cells. A barium enema x-ray showed evidence of a fistulous connection between the ascending colon and the right flank. There were fibrotic changes in both lungs.

After preparation by digitalization, forced high protein feedings and general care, an exploratory laparotomy was performed on October 24, 1957, through a right rectus incision. The right colon

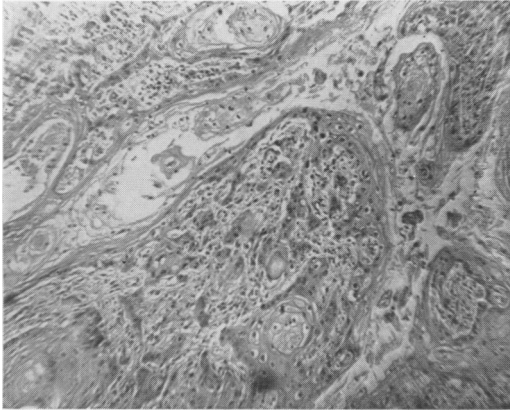


FIG. 4 B. Epidermoid carcinoma in nephrostomy fistulous tract. (Case 7.)

was removed and an ileotransverse colostomy was performed. Biopsy of the tissue removed showed the fistulous tract to contain squamous cell carcinoma which apparently had caused necrosis of the bowel (Fig. 4 A, B). Because of the patient's age and general condition and the extent of the tumor mass, the tumor was considered inoperable. Following irradiation her condition improved, however, and she gradually returned to a condition of ambulatory health. She re-entered the hospital in March 1958, with bilateral bronchopneumonia and expired on March 15, 1958. Autopsy revealed bilateral bronchopneumonia and the fistulous tract passing through a large squamous cell carcinoma of the right flank.

**Case 8.** A 57-year-old white male was hospitalized on August 28, 1950, because of draining sinuses of the left hip and buttock of many years duration. The patient had had diplegia of the lower extremities from birth. Because of increasing pain and persistence of the drainage from the sinuses a biopsy had been performed at another hospital which revealed epidermoid carcinoma.

Physical examination revealed an emaciated white male. There was a urethral catheter in place. The pulse was 80, respiration 20, B.P. 110/70. There was a large necrotic area in the perineal region and left buttock which drained purulent fluid. A large meningocele was noted and there were scars on both buttocks of previous incisions. Both lower extremities were atrophic with limited motion due to contractures, and there was bilateral equinovarus. Except for a blowing systolic heart murmur the remainder of the physical examination was not remarkable. Laboratory studies including urinalysis and blood studies were within normal limits.

On August 29, 1950, a cannula was placed in

the left inferior epigastric artery and 5 mg. of nitrogen mustard was injected into it. In spite of this the patient's condition steadily worsened and he expired on October 3, 1950.

### Summary

Eight cases of carcinoma developing in fistulous tracts are presented. Six of these occurred in pre-existing fistulas in ano. Of these, four were adenocarcinomas, and two squamous cell carcinomas. One died within six months after operation. One underwent resection too recently for evaluation. Four are living and well from one to four years after operation. Two of the patients developed squamous cell carcinoma in other types of sinus tracts. In both of these, because of poor general condition, palliative resection only was performed.

The clinical characteristics and treatment of this condition are discussed.

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