

FISTULA IN ANO

A FIVE-YEAR SURVEY AT GROOTE SCHUUR HOSPITAL AND A REVIEW OF THE LITERATURE

J. TERBLANCHE, M.B., CH.B., F.C.S. (S.A.), *Department of Surgery, Medical School, University of Cape Town*

'Fistula' is the Latin word for a reed, pipe, or flute. Goligher's definition of a fistula in surgery is a 'chronic granulating track connecting two epithelial-lined surfaces'.¹ The term fistula in ano, however, covers both true fistulae, and what should strictly be called sinuses.² Most authorities today accept that 'an anal fistula is essentially the final result of progression of an acute anal abscess' (Turell³).

Descriptions of fistula in ano are found in ancient medical writings. Parks points out that 'the condition would appear to have been commoner in ancient and mediaeval times than it is today, since it occupies more space in old manuscripts than its present frequency would justify'.⁴ John Arderne, a surgeon of the 14th and early 15th centuries, gave an excellent account of fistula in ano and its treatment in his writings, which were transcribed in the British Museum in 1910 by Power.⁵ He emphasized the importance of careful personal postoperative care of the patient, and allowed the wound to granulate from the base, unlike his colleagues, who practised cauterization. When possible he lived in the patient's home and did the dressings personally, until the wound was healed.¹ After Louis XIV was operated upon for fistula in ano, it became a popular and fashionable operation. It is interesting to recall that St. Mark's Hospital, London, was founded in 1835 by Frederick Salmon primarily for the treatment of anal fistula.¹

In this paper recent concepts of the pathogenesis and treatment of fistula in ano will be surveyed, and a retrospective review presented of 129 cases of this disease treated in our surgical wards over a 5-year period from July 1957 to June 1962; 13 children treated at the Red Cross Children's Hospital over the same period will also be presented.

The adult case histories were traced through the records department of Groote Schuur Hospital. The series of 129 patients includes all those on which adequate notes were available. 92 were non-Europeans and 37 Europeans (Table I).

NEWER CONCEPTS OF PATHOGENESIS AND TREATMENT

Classification and Anatomical Distribution

The classification used here is the classical and generally accepted one of low-level anal, high-level anal, subcutaneous, submucous, anorectal, and pelvirectal (Table I). The distribution in this series was much the same as described elsewhere. The majority were made up of the usual low-level and high-level anal fistulae. A few of the cases in our series were associated with hidradenitis suppurativa. The cases placed in the 'undetermined' group were those where

the notes did not indicate clearly the anatomical level of the main fistula. When multiple fistulae were present, the case was classified under the dominant type. No significant difference was noted in the anatomical distribution in the two major race groups in our series (Table I).

TABLE I. FISTULA IN ANO, GROOTE SCHUUR HOSPITAL

	Non-European cases		European cases	
	No.	%	No.	%
Total cases	92		37	
Low-level anal	50	55%	18	49%
High-level anal	23	25%	10	27%
Subcutaneous	6	7%	2	5%
Submucous	0		1	3%
Ischiorectal/Anorectal	4	4%	1	3%
Pelvirectal	1	1%	1	3%
Hidradenitis suppurativa	2	2%	2	5%
Undetermined	9	10%	2	5%

Milligan analyzed 328 cases treated at St. Mark's from 1939 to 1941. Low-level anal were present in 76.2%, high-level anal in 15%, anorectal in 5.1%, subcutaneous and submucous in 3.7%.⁶

Although the classical classification used here is satisfactory in theory, in practice it is not always so useful. Many authorities would agree with Thompson,⁷ who stated: 'A past error in recognition between the lower end of the internal sphincter and the subcutaneous external sphincter undermined my belief and confidence in the practical value of the exact anatomical classification of fistulae . . . As regards orthodox treatment the issue has no practical importance.' He recognizes two types of fistula in ano, (1) a complex anal fistula, difficult to treat, constituting 5%, and (2) simple anal fistula, which is easy to treat. The difficult ones are the pelvirectal and the horseshoe-type ischiorectal fistulae.⁷ Stonesifer *et al.*⁸ emphasize that many incorrect concepts arose because of Milligan and Morgan's erroneous anatomical description, which gave relative oversize to the subcutaneous part of the external sphincter.

Anatomy and Pathogenesis

Parks and Morson⁹ hold that two problems arise in the aetiology and pathogenesis of fistula in ano, (1) how organisms cross the anal wall into the tissues, and (2) by what means the infection, thus arising, persists. To be able to consider this, one must recall the anatomy of the anal canal and also the anatomy of abscesses in this area. The classical anatomical description of Milligan and Morgan is not accepted by most proctologists today.^{10, 11} Recent anatomical studies by a number of workers indicate

mistakes in the original description (Stonesifer *et al.*,⁸ Fowler,¹² Parks¹³). These studies were all based on large numbers of anatomical dissections, and the conclusions are similar to those drawn by Eisenhammer¹⁴ from operative dissections. The reader is referred to these excellent papers for further details of modern concepts of the anatomy.

One of the most important aspects of the anatomy concerns the anal glands and anal ducts. In 1738 John Astruc noted the anal crypts¹⁵ and in 1880 Herrmann and Desfosses described what we now know as the anal glands or ducts.⁹ The first detailed histological description, however, was given by Hill *et al.*¹⁵ in 1943. Before this it had only been presupposed that the anal glands played a part in perianal suppuration. In the series of 17 cases, all had anal glands extending into the subepithelial tissues, and in 2 these glands were seen to penetrate the internal sphincter. They also pointed out that evidence of secretory activity could be demonstrated histologically, indicating that anal glands are functional, and not merely vestigial.¹⁵

In 1961 Parks⁴ demonstrated that anal glands were present in all of 44 specimens studied; that in two-thirds of these one or more branches entered the internal sphincter and, in one-half, branches crossed the internal sphincter completely. However, no branch was observed to go beyond the longitudinal layer (i.e. into the ischioanal fossa). This fact is important in considering the pathology of fistula in ano. Parks has also demonstrated that the glands in patients with fistula in ano are not normal. At times he found macroscopic cystic cavities up to 1 cm. in diameter. Some contained vegetable matter, suggesting that faecal material had entered the ducts. He was also able to demonstrate that the infected cystic spaces were always deep to the internal sphincter. This concept was suggested by Eisenhammer in 1958, and Parks⁹ states that his work adds pathological confirmation to Eisenhammer's theories.

Thus, in considering the aetiology and pathogenesis of fistula in ano, the anal glands, with their ducts opening into the anal canal at the crypts, provide a possible source of entry of organisms deep into the tissues and, if the glands are abnormal, also a means of persistence of organisms in this situation. Parks⁴ feels that in over 90% of cases the cause of fistula in ano is infection of the anal glands, and Eisenhammer has held a similar view for a long time.

Concepts of Eisenhammer and Parks

Eisenhammer's views are based on the concept that the intermuscular fistulous anorectal abscess is caused by infection of an anal gland, and subsequently spreads and bursts to form a fistula. In his papers Eisenhammer^{10, 16} presents diagrams clearly demonstrating the progress from an intermuscular fistulous abscess to a high-level or a low-level anal fistula. He postulates that an anal gland situated high in the intermuscular space will give rise to a high abscess and, if untreated, will lead to a high-level fistula in ano. A low-level fistula in ano is similarly presumed to arise from a gland situated low in the intermuscular space. (The intermuscular space is the area between the fibrous downward continuation of the longitudinal coat of the rectum and the internal sphincter.^{10, 16})

In treating such abscesses Eisenhammer advises internal

sphincterotomy and drainage from within the rectum.^{10, 17, 18} Modern proctologists appear to accept these views. If one does accept them, the approach from inside the rectum would appear to be more rational than an approach through the external sphincter, which is beyond the confines of the lesion!

Both Eisenhammer¹⁶ and Parks^{4, 9} point out the fallacy of the fairly widely held belief concerning the cause of fistulae, namely that infection penetrates the wall of the anal canal through a fissure or other wound, and that the infected tract is maintained by faeces that enter via the internal wound. They point out that the internal sphincter acts as an impermeable barrier to infection arising in the lining tissue of the anal canal. For example, haemorrhoidectomy and injection of haemorrhoids, which at times lead to local slough and infection, *never* result in abscess formation deep to the internal sphincter with fistula in ano. Eisenhammer ascribes most anal abscesses and fistulae to anal-gland infection. Parks⁴ holds that Eisenhammer's views represent a considerable advance in the theory and practice of the treatment of these conditions. His work merely adds pathological confirmation to the theories of Eisenhammer.

In the light of these concepts, Parks⁴ has evolved a new approach to treatment, consisting of excision of the portion of the internal sphincter overlying the affected anal gland or gland abscess together with the gland. That is to say, he performs a partial internal sphincterectomy of the abscess-bearing muscle, rather than internal sphincterotomy as advised by Eisenhammer. He then cores out the external part of the fistulous tract. In a recent article he reports on 30 unselected consecutive patients treated in this manner with primary healing occurring in all wounds. Of this series 70% were manifestly caused by infected anal glands and histological evidence suggested a similar origin in 7 more, which brings the total that may be ascribed to this aetiology to 90%.⁴ Eisenhammer¹⁰ puts it even higher, and holds that 97% of fistulae have internal cryptoglandular origin (all except the true submucous and pelvirectal varieties secondary to pelvi-abdominal disease).

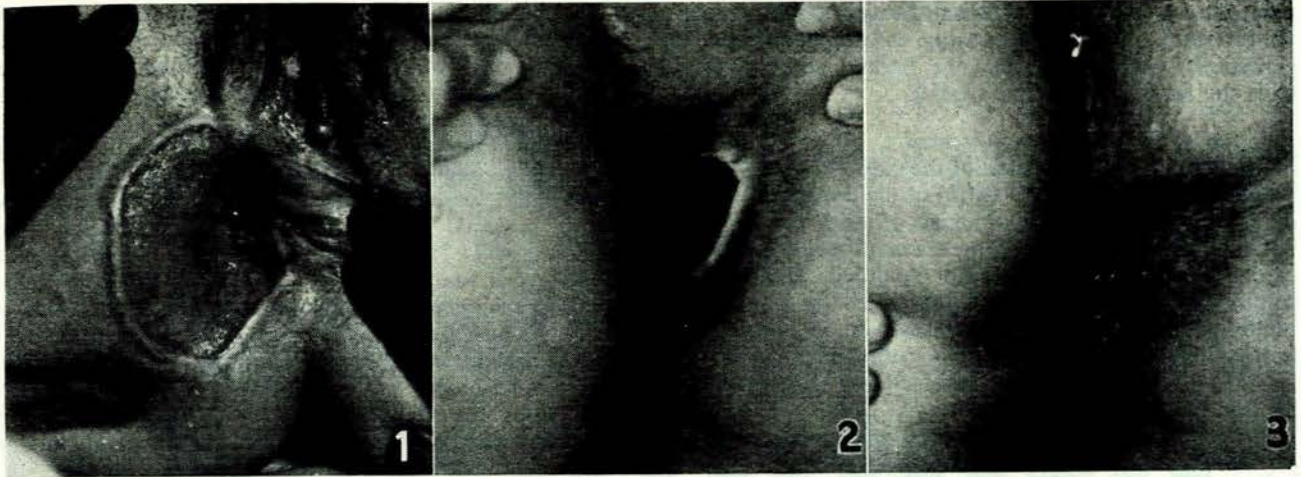
Parks⁴ concludes that extirpation of the intersphincteric abscess of origin is the crucial factor for cure. In the low anal variety his procedure is similar to the 'lay open', but more radical. For higher fistulae it has the great advantage that no part of the external sphincter is sacrificed, thus ensuring that continence is retained, and large deforming wounds are avoided.

ORTHODOX TREATMENT AT GROOTE SCHUUR HOSPITAL

One is familiar with the orthodox treatment of fistula in ano. Figs. 1, 2 and 3 show the typical sequence in a patient treated in this manner—the wide flat wound after fistulectomy, and the slow but sure healing. This form of treatment was undertaken in most of the cases in this series.

Age, Sex and Race Incidence

The distribution of fistula is fairly evenly spread over the various adult age groups at Groote Schuur Hospital. In the 92 non-European patients the youngest was 16 years old and the oldest 72, the average age being 36 years. In the 37 Europeans the youngest was 23 and the oldest 79,



Figs. 1, 2 and 3. Treatment of fistula in ano. (1) The wound after fistulectomy. (2) Healing in progress. (3) Fistula healed.

the average being 45. Although uncommon it does occur in children (see below). No special or significant point arose out of the age distribution of our patients.

There was a preponderance of males in our series (79% in the non-Europeans and 84% in the Europeans), which is a little higher than the 75% male incidence quoted by Gabriel² in a 10-year survey at St. Mark's of 1,365 cases. I have not found a satisfactory explanation for the preponderance of males. A suggestion is that the anal glands in the male may be more liable to infection.

The non-European cases include 83 Coloured and 9 Bantu. Of the Coloured 78% were males, and of the 9 Bantu 8 were males. However, there is a greater Bantu male population in Cape Town than female (at least 2:1).

Results of Treatment

Of the 129 cases included in this series, 7 of the non-Europeans (8%) and 5 of the Europeans (14%) had been previously admitted for treatment of fistula in ano, mostly before the commencement of this series.

Of the non-Europeans, 5 were admitted for the second time, but only one of these was in the wards twice in the 5-year period of this study. Of the fistulae in these 5 patients, 1 was a high-level anal fistula, 1 was caused by hidradenitis, 1 was tuberculous, and 1 was of the horseshoe type. The 5th had been treated for a previous high-level anal fistula on the one side, and presented on this second occasion with a low-level fistula on the other side.

One of the non-European patients was admitted for the 4th time and one for the 11th time. There was no indication in the enormous hospital file of the latter that there was any hidradenitis, and histology revealed no tuberculosis; the fistula was low level.

Of the Europeans, 4 were admitted for the second time, and of these 3 were in hospital twice in the 5-year period of the study; 3 of the 4 had complex high-level fistulae, and the other a pelvic rectal fistula. One other patient, who was in for the 4th time, was a man with hidradenitis suppurativa.

It is felt that the low incidence of return to hospital for

further treatment tends to indicate a good cure rate, despite the early discharge from hospital because of pressure for beds. If the cure rate is high, then our treatment, which has to date mostly followed the orthodox lines, must be assumed to be satisfactory. Is there then any indication to change it? This is an important point that must be carefully assessed before it is decided to change to the Parks' method.

In an article published in 1962, Bennett¹⁹ reviewed 129 cases treated in the orthodox manner at the General Infirmary, Leeds, over a 6-year period; 118 of these were examined personally by himself. Recurrence or incomplete healing occurred in 10 patients, the main trouble being in the high anal and horseshoe types. Of 114 patients questioned, 36% complained of one or more defects of anal control, and all put this down to their operation; 12% had inadequate control of faeces, 16% inadequate control of flatus, and 24% frequent soiling of underclothes. However, in 100 so-called 'normal' controls, 10% had one or more of these defects, indicating the difficulty that arises in attempting such an assessment. Bennett makes the point that functional defects, even after preservation of the anorectal ring, are commoner and more disturbing than is generally recognized. They are most frequent in high anal and horseshoe fistulae. He writes: 'It is poor consolation for the fastidious patient who, after 17 weeks off work for treatment of his horseshoe fistula, finds that his underclothes are stained brown instead of yellow, even though the fistula is healed.' Once again, one wonders whether the Parks' operation would not give better results. It must be emphasized that most authors who report personal series claim 100% good results. This includes Turell,³ of the USA, and Wilson,²⁰ from Australia. However, even Eisenhammer¹⁷ has reported functional anal defects following on some cases of total internal anal sphincterotomy, but not after partial internal anal sphincterotomy (as practised by Parks). Bennett and Goligher,²¹ in a recent paper on internal sphincterotomy for fissure in ano, report an initial 34% incidence of defect in anal control, lessening to 13% after 3 years. My own feeling is that one must

accept it as a fact that functional disturbances do occur in the orthodox operation, even when carefully performed by experts. It would appear that the Parks' operation should have the least postoperative trouble.

Relation to Previous Anal Abscesses

In quite a large proportion of the cases—29 (32%) of the non-European cases and 15 (41%) of the European—a story of previous incision and drainage of anal abscesses was obtained from the notes. There are probably still more cases where this aspect was not recorded. This helps to confirm the present-day view that a fistula is merely a stage in a disease which commences with an abscess. Is it not possible that this progression to fistula would become less if the abscesses were drained by Eisenhammer's method of internal sphincterotomy?

Tuberculous Fistula in Ano

For many years people have been aware that fistula in ano may be tuberculous in origin. It may be secondary to tuberculous infection of the chest, or may occur with no obvious evidence of tuberculosis elsewhere. Its incidence varies in different series and at different times.

Our pathologists are confident that they can diagnose a tuberculous fistula in ano correctly on histological grounds, and can differentiate it clearly from such conditions as foreign-body reactions and Crohn's disease.

Of the 129 cases in our series, a histological examination was made in only 58 (42 non-European and 16 European). Of the 42 non-Europeans thus examined, 7 were histologically shown to be cases of tuberculous fistula in ano, an incidence of 17%.

Of these 7 cases 4 were found in the first 6 months of 1962, 2 in 1961, 1 in June 1960, and none before this date. The 2-year period from June 1960 to June 1962 includes just over one half of the total of 92 cases, and 25 of the 42 cases in which histology was done. This appears to indicate that the incidence of tuberculous fistula in ano in Cape Town non-Europeans is probably higher than the 17% quoted here. In the past year we have been on the alert for this condition.

None of the 7 tuberculous cases showed active tuberculosis on chest X-ray, but one that came to postmortem did in fact have a pulmonary lesion not seen on the X-ray. Four of the 7 were cases of multiple high fistulae; of these 1 had tuberculosis of the rectosigmoid, 1 a pelvirectal fistula, and 2 high-level fistulae. The other 3 were cases of low-level fistula in ano and the first indication of a tuberculous aetiology was the histology report.

In addition to these 7 cases, 2 other non-European patients had local perianal ulcers (but not true fistulae) biopsied and found histologically to be tuberculous.

Of the 16 European cases histologically examined, only 1 was proved to be a tuberculous fistula in ano, and his chest X-ray was also normal. He was a tuberculous contact and local examination revealed multiple sinuses.

X-rays of the chest were available in 94 of the 129 cases in our series. In 5 non-Europeans and 1 European they showed florid tuberculosis of the chest. In the European patient the fistula was excised, and no evidence of tuberculosis was found locally. The 5 non-European patients were not operated upon at Groote Schuur Hospi-

tal, all being sent to the city tuberculosis clinic. Three of them had what appeared to be tuberculous fistulae clinically. Thus there was a 7% incidence of tuberculosis of the chest in non-European patients with fistula, associated in at least 3 patients with clinically tuberculous fistulae.

The incidence of tuberculous fistula in ano is variously stated in the published literature. Gabriel²² in 1921 quoted a 16% incidence in 75 consecutive cases. In 1948 the same author² reviewed 1,500 fistulae at St. Marks and found an incidence of 11.7%. Jackman and Buie²³ in 1946 reported on 600 cases from the Mayo Clinic investigated clinically, histologically, and by guinea-pig inoculation, with a 7-8% incidence of tuberculous fistula. Of these a great proportion had an active lung lesion as well. Bennett¹⁰ in 1962 reported only 1 case of tuberculous fistula in 129 cases from the General Infirmary, Leeds. Wilson²⁰ in 1959 reported that tuberculous fistulae were very rare in Australia.

On the other hand, Granet²⁴ in 1954 reported a 6% incidence of anorectal abscess and fistula in tuberculous patients on treatment in the Sea View Sanatorium in New York City. Goligher¹ in 1961 stated that in his own personal series of fistula in ano he had 28 proved tuberculous cases. In 9 of them the pulmonary lesion was well healed on X-ray, and in 4 no X-ray evidence of tuberculosis was found. Goligher states that 8-10% of all fistulae biopsied show histology suggestive of tuberculosis, but that half of these turn out to be a foreign-body reaction rather than tuberculosis. (As stated before, our pathologists are confident that they can differentiate these conditions.)

These figures appear to indicate that elsewhere in the world, as in our European population, with the decline in tuberculosis in general the incidence of tuberculous fistula in ano is also falling; but in our non-European population, where tuberculosis is rife, a fair percentage of the fistulae presenting at the outpatient department are in fact tuberculous. In many there is no suspicion of tuberculosis until histology is performed, and the tuberculous origin will often be missed unless histology is a routine. Parks and Morson⁹ mention an interesting point in this respect. They recall that in 1914 Johnson coined the term 'the anal tonsil' because of the amount of lymphoid tissue in and around this area, and suggest a connection with tuberculous fistula in that the tubercle bacilli invade the lymphoid area.

Hidradenitis Suppurativa

The relationship of hidradenitis suppurativa to fistula in ano is of interest. Two of the non-European cases of fistula (2%) and 2 of the European cases (5%) suffered from this condition (Table I). Other cases of hidradenitis were treated during this period, but these 4 were the only patients who had fistula in ano associated with the disease.

To quote Goligher,¹ 'Hidradenitis suppurativa is a chronic, indolent, inflammatory disease of certain areas of skin and subcutaneous tissues, characterized by the formation of abscesses and sinuses, and due primarily to an infection of the apocrine group of sweat glands'. One of the sites in which it occurs is the perianal region, and thus these patients may present to the rectal surgeon with a fistula in ano. Goligher states that 'apocrine glands are large compound tubular glands, 50 mm. long, 2 mm. wide, and from

3 to 5 mm. deep'. They are restricted to 'the axillary, mammary, inguinal, genital and perianal regions', and only the last are pertinent to the present paper. 'They are developed from the hair follicles, but do not become active until puberty.' Thus hidradenitis occurs after puberty and the diagnosis is usually not difficult, as long as the condition is borne in mind. Histologically, they are recognizable. The treatment advised is excision.^{1, 25}

The condition was first reported in the English literature in 1939, by Brunsting from the Mayo Clinic.²⁶ Jackman and McQuarrie²⁷ in 1949 reported on 388 patients from the Mayo Clinic; 32% of these occurred in the perianal region, and about 10% had anal lesions alone.

Of our Europeans, one had multiple sinuses in the left buttock, which were excised, and the other presented with what appeared to be subcutaneous fistulae, which were

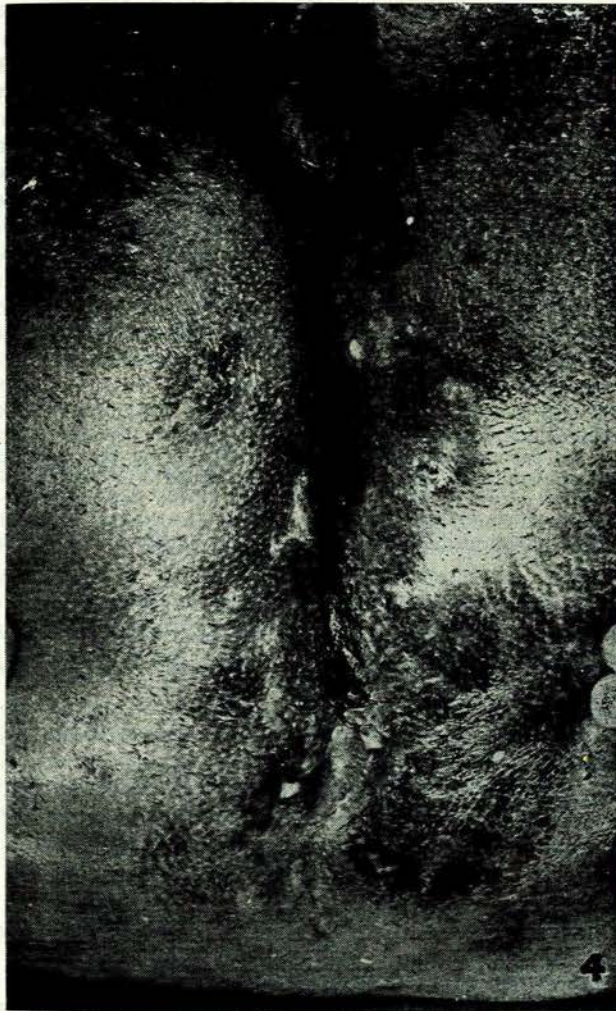


Fig. 4. Hidradenitis suppurativa: perianal lesion in patient N.L.

excised. Of the non-Europeans, one had his axillary lesion attended to at the same time as his high-level fistula. The other patient had a wide excision of multiple sinuses. Figs. 4 and 5 are photographs of the condition in another Euro-

pean patient, N.L., whose perianal lesion was treated in our wards prior to this series.

A condition that crops up in the differential diagnosis of some of these cases is a pilonidal sinus, but if hidrade-

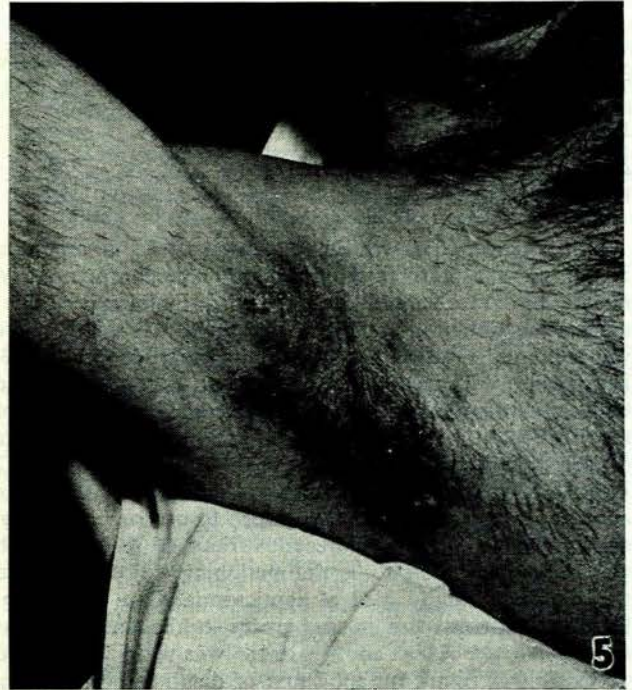


Fig. 5. Hidradenitis suppurativa: axillary lesion in patient N.L.

nitis suppurativa is borne in mind the diagnosis is not difficult.

Other Diseases Associated with Fistula in Ano

One of our cases, a 39-year-old Coloured female, who had a high-level fistula in ano associated with a low rectal stricture due to lymphogranuloma, was treated successfully by a 2-stage operation. Another case, a Coloured male, was found to have a mutton bone in the fistula. In 2 Coloured males the fistula was associated with condyloma acuminata, which were excised at the same time.

In 1959 Morson and Lockhart-Mummery,²⁸ stating that in England at that time the finding of giant-cell systems was as likely to indicate Crohn's disease as tuberculosis, pointed out that a fistula sometimes appeared before any manifestations of abdominal Crohn's disease. At St. Mark's Hospital the cases of Crohn's disease histologically simulating tuberculosis were differentiated by the fact that the giant-cell systems were non-caseating.

FISTULA IN ANO IN CHILDREN

The material for this section was obtained from the records of Red Cross War Memorial Children's Hospital over the same 5-year period as the rest of the study. There were 13 cases, 9 non-European and 4 European (Table II). If these are added to the adults, the children constitute 9% of the total series. The series was too small to permit any conclusions, but most of the fistulae were low-level anal, as in the adults. The one anorectal fistula was a complex one

and the patient subsequently died and will be mentioned below. The pelvirectal fistula healed after colostomy. The 'healed' fistula had healed spontaneously by the time the patient was admitted.

TABLE II. FISTULA IN ANO, RED CROSS HOSPITAL

	Non-European cases	European cases
Total cases	9	4
Low-level anal	6	3
High-level anal	1	
Ischiorectal/Anorectal	1	
Pelvirectal	1	
Healed		1

Not a single case was demonstrated to be tuberculous. Histology was performed on 2 cases only, unfortunately, but neither revealed tuberculosis and no pulmonary tuberculosis was noted on any of the 4 chest X-rays done. There was a preponderance of male patients (non-Europeans 6:3, Europeans 4:0). The ages of the non-Europeans varied between 5 months and 10 years (average 4 years), and of the Europeans between 10 months and 11 years (average 6 years). The non-Europeans comprised 7 Coloured and 2 Bantu children. Two of the cases (non-Europeans) were admitted more than once—one for closure of colostomy, and the other for an anorectal variety of fistula, which was not cured despite a defunctioning colostomy, and this child eventually died of septicaemia. One other non-European patient died in this group—while the child was in hospital but before any treatment was undertaken—and no cause was found for the cause of death at postmortem. Previous operations had been performed on 4 of the non-European children and 1 of the European.

This survey of the children with fistula in ano does at least indicate (1) that fistulae in ano are not confined to adults, as is often assumed, and (2) that the type and distribution are much the same as in adults.

CONCLUSIONS AND SUMMARY

One section of this paper deals with a 5-year survey of the orthodox treatment in 129 cases of fistula in ano at Groote Schuur Hospital. The satisfactory results of this form of treatment are pointed out. The age and sex incidence are much the same as in series reported from elsewhere, with the usual male preponderance. A previous history of an anorectal abscess, which was incised and drained, is often present.

The incidence of tuberculous fistula in ano is 17% in the non-European group (i.e. in those cases where the fistula was subjected to histological study) and much less in the Europeans. The figures in our European cases along with the figures from elsewhere in the world appear to indicate that, with the decline of tuberculosis in general, the incidence of tuberculous fistula in ano is falling. In our non-European population, however, where tuberculosis is still common, a high percentage of the fistulae that present at the outpatient department are in fact tuberculous. It is also noted that a tuberculous fistula in ano need not present clinically as a typical tuberculous lesion. Thus, unless all specimens are submitted for histological examination and tuberculosis is looked for by an experienced

pathologist, the true incidence of tuberculous fistula in ano will not be evident.

Cases of hidradenitis suppurativa, and of fistula in ano in childhood, are also discussed.

The newer concepts of the anatomy of the anal canal, and especially of the anal glands and their ducts, which open into the anal crypts, are discussed. Eisenhammer's view of the importance of the intermuscular fistulous abscess is mentioned. It is evident that a source of entry of organisms deep into the tissues via anal gland ducts is present, as well as conditions that favour continuing infection in such an infected gland, which allow the fistula that forms to persist.

In the light of these concepts, it is felt that Parks' new approach to the operative treatment should be tried. He advocates partial internal anal sphincterectomy of the infected gland-bearing area, plus coring out of the tract of the fistula. My own feeling is that, although the conventional methods of treatment give good results in general, as evidenced by the results reported in this paper and by others, the Parks' method of treatment is more rational in the light of present-day knowledge of the anatomy and pathogenesis of anal fistula, and should give better results. Postoperative defects of anal control will probably be lessened by the sphincter saving which ensues when this method is used for the higher-level fistulae. It must be borne in mind that sphincterotomy may result in defects of anal control. An extensive test of the Parks' method is required, and it is the intention of our Department to give it a fair trial.

I wish to express my appreciation and thanks to Prof. J. H. Louw, Head, Department of Surgery, University of Cape Town, for his encouragement, advice and help during the planning and preparation of this paper. I am also grateful to the Medical Superintendents of the Groote Schuur and the Red Cross War Memorial Children's Hospital, Dr. J. G. Burger, and Dr. J. F. W. Mostert, for permission to report details of these cases.

REFERENCES

- Goligher, J. C. (1961): *Surgery of the Anus, Rectum and Colon*, p. 174. London: Cassell.
- Gabriel, W. B. (1948): *The Principles and Practice of Rectal Surgery*, p. 194. London: H. K. Lewis.
- Turell, R. (1958): *N.Y.S. J. Med.*, **58**, 1473.
- Parks, A. G. (1961): *Brit. Med. J.*, **1**, 463.
- John of Arderne (c.1376): cited by Parks, A. G. (1961): *Ibid.*, **1**, 463.
- Milligan, E. T. C. (1943): *Op. cit.*²
- Thompson, H. (1962): *Proc. Roy. Soc. Med.*, **55**, 754.
- Stonesifer, G. L. jr., Murphy, G. P. and Lombardo, C. R. (1960): *Amer. J. Surg.*, **100**, 666.
- Parks, A. G. and Morson, B. C. (1962): *Proc. Roy. Soc. Med.*, **55**, 751.
- Eisenhammer, S. (1958): *Surg. Gynec. Obstet.*, **106**, 595.
- Brossy, J.-J. (1958): *S. Afr. Med. J.*, **32**, 285.
- Fowler, R. jr. (1957): *Aust. N.Z. J. Surg.*, **27**, 1.
- Parks, A. G. (1958): *Postgrad. Med. J.*, **34**, 360.
- Eisenhammer, S. (1953): *S. Afr. Med. J.*, **27**, 266.
- Hill, M. R., Shryock, E. H. and ReBell, F. G. (1943): *J. Amer. Med. Assoc.*, **121**, 742.
- Eisenhammer, S. (1956): *Surg. Gynec. Obstet.*, **103**, 501.
- Idem* (1959): *Ibid.*, **109**, 583.
- Idem* (1961): *Ibid.*, **113**, 519.
- Bennett, R. C. (1962): *Proc. Roy. Soc. Med.*, **55**, 756.
- Wilson, E. (1959): *Aust. N.Z. J. Surg.*, **29**, 177.
- Bennett, R. C. and Goligher, J. C. (1962): *Brit. Med. J.*, **2**, 1500.
- Gabriel, W. B. (1921): *Proc. Roy. Soc. Med.*, **14**, 156.
- Jackman, R. J. and Buie, L. A. (1946): *J. Amer. Med. Assoc.*, **130**, 630.
- Granet, E. (1954): *Op. cit.*¹
- Engelbrecht, J. A. (1963): *S. Afr. Med. J.*, **37**, 683.
- Brunsting, H. A. (1939): *Op. cit.*¹
- Jackman, R. J. and McQuarrie, H. B. (1949): *Amer. J. Surg.*, **77**, 349.
- Morson, B. C. and Lockhart-Mummery, H. E. (1959): *Lancet*, **1**, 1122.