

FISTULA-IN-ANO: A PROSPECTIVE AUDIT

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ABSTRACT

Objective: Fistula-in-ano is a common condition that is characterized by intermittent pain and discharge. We present an audit of all patients seen with anal fistula at Prince Hashem Hospital during an eighteen month period.

Methods: This audit includes all patients that underwent examination under anesthetic for fistula-in-ano from September 2006 to May 2008. Anatomic classification and operative procedures of all fistulae were recorded. Patients were followed-up for a mean period of 13 months and details of wound healing, fistula recurrence and function were gathered.

Results: Forty three consecutive patients underwent examination under anesthesia for fistula. There were 36 males with a mean age of 32.2 years (range 17-65). Eight (18.6%) patients had superficial, 15 (34.9%) intersphincteric, 17 (39.5%) transsphincteric, 3 (7%) suprasphincteric and none had extrasphincteric fistulae. Forty (93%) patients had fistulae of cryptoglandular (idiopathic) origin. Two (4.7%) patients had Crohn's disease and one (2.3%) had low rectal malignancy. Thirty two (74.4%) patients underwent fistulotomy. One (2.3%) patient had advancement flap. Nine (21%) patients had loose seton in situ and one patient underwent abdominoperineal resection. Four (9.5%) patients had some degree of flatus incontinence, two (4.8%) had incontinence to liquid stool. Soiling was present in one patient.

Conclusions: Fistula-in-ano is relatively a common condition in Jordan. Its variation in anatomical distribution should alert the surgeons for the variety of surgical options available for its treatment, especially the difficult and complex ones, that should be managed by a colorectal surgeon or general surgeon that has adequate experience in this field. Unusual causes like Crohn's disease and malignancy should be kept in mind in complex, unhealed fistulae.

Key words: Fistula-In-Ano, Fistulotomy, Incontinence.

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Introduction

Fistula-in-ano is relatively a common condition defined by an abnormal track that connects two epithelialized surfaces, usually the anal canal to the perianal skin. The cryptoglandular theory of Parks⁽¹⁾ is now widely accepted. Parks found cystic dilatation of anal glands in eight of 30 consecutive cases of anal fistula. He attributes this to either acquired duct dilatation or a congenital abnormality

and suggested that it was a precursor to infection within a mucin-filled cavity.

In addition to fistulas of cryptoglandular origin, other causes like trauma, Crohn's disease,⁽²⁾ malignancy, radiation, or unusual infections (tuberculosis, actinomycosis, and chlamydia) may also produce fistulas. A complex, recurrent, or nonhealing fistula should raise the suspicion of one of these diagnoses.⁽³⁾

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Sir Alan Parks provided a detailed classification of anal fistula that withstood the test of time.⁽⁴⁾ He classified fistula into intersphincteric, transphincteric, suprasphincteric and extrasphincteric. A prospective study⁽⁵⁾ from St Mark's hospital in 2000, demonstrated that 86 (88%) out of ninety eight patients had fistulae of cryptoglandular (idiopathic) origin. Fistulae were superficial in 11 (11%) patients, intersphincteric in 30 (31%) patients, transphincteric in 52 (53%) patients, suprasphincteric in three (3%) patients and extrasphincteric in two (2%) patients. Forty nine (50%) fistulae were classified as complex.

Proper management of fistula-in-ano is an important aspect of colorectal practice. The principles of fistula surgery are to eliminate the fistula, prevent recurrence and preserve sphincter function. Success is usually determined by identification of the primary opening and dividing the least amount of muscle possible.

The majority of anal fistulae are simple and low and can be identified properly by digital examination and satisfactorily treated by fistulotomy.^(6,7)

More complex fistulae, in which there may be involvement of a substantial portion of the sphincter muscles and/or there is multiple secondary tracks need further investigations either by endoanal ultrasonography or magnetic resonance imaging.^(8,9) These fistulae pose a surgical challenge, as fistulotomy in such cases may render the patient incontinent.⁽¹⁰⁾ Common techniques for dealing with difficult fistulae include the use of either cutting or loose setons^(11,12) and advancement flaps.^(13,14) More recently the use of a fibrin sealant has been described.^(15,16,17)

The aim of this study is to assess prospectively the presentation, classification, management and outcome of a consecutive series of patients with Fistula-In-Ano.

Methods

From September 2006 to May 2008 all patients who underwent examination under anesthesia for Fistula-In-Ano at Prince Hashem Hospital (PHH) in Zarka/Jordan were prospectively followed for a period of 13 months (range 2-20).

At the first presentation, patients with anal pathology were assessed in the clinic. Patients with Fistula-In-Ano were given an appointment for examination under anesthesia. Those who had other anal pathologies were treated accordingly either

conservatively or surgically. Anovaginal and rectovaginal fistulae were excluded. Records were kept of details of existing and previous anal pathology, investigations, medical and surgical treatments. All patients were questioned regarding their continence prior to surgery. The surgery was performed by the first author. All patients underwent examination under anesthesia in the lithotomy position with cleaning of the anal region and draping, and comprehensive operative details were recorded. Fistulae were classified on the basis of operative findings and according to Parks' classification.⁽⁴⁾ The internal opening of the fistula tract was identified manually, where this failed, H₂O₂ was used. Treatment was initiated according to the site of the fistula, its primary and secondary tracks and state of the sphincters. At follow-up, details of wound healing, flatus and faecal continence, fistula recurrence and further surgical interventions required were recorded.

Results

Forty three patients were audited. There were 36 (84%) males and seven (16%) females, with a mean age of 32.2 years (range 17-65). Mean duration of symptoms prior to presentation was 18 months (range 2-40). Twelve (28%) patients had previous surgery for fistula. They underwent a total of 18 surgical procedures (range 1-3) at PHH and other hospitals. Operations ranged between fistulotomy, tight seton and fistulectomy with or without primary closure. Five patients had other different surgical procedures, including internal lateral sphincterotomy (n=2) and haemorrhoidectomy (n=3). None of the female patients had major obstetric trauma, but five had episiotomies during delivery. Thirty seven (86%) patients had an abscess preceding their fistula. Thirty of them were drained surgically and seven were spontaneously drained.

The aetiology of fistula was idiopathic in 40 (93%) patients, Crohn's disease in two (4.7%) and one (2.3%) patient had low rectal malignancy with fistulization into the perineum. Eight patients underwent magnetic resonance imaging (STIR sequence) for the fistula.

Under general anesthesia with prophylactic antibiotics, all patients had examination in lithotomy position. The operative findings were as follows: eight (18.6%) fistulae were superficial, 15 (34.9%) intersphincteric, 17 (39.5%) transphincteric, three (7%) suprasphincteric (see Table I).

Table I. Fistula history, aetiology and operative findings

	Male	Female
Patients	36	7
Preceding abscess	33	4
Previous surgery for fistula	10	2
Episiotomy	-	5
Previous anal surgery:		
Lateral sphincterotomy	2	-
Haemorrhoidectomy	1	2
Aetiology:		
Idiopathic	33	7
Crohn's	2	-
Rectal Cancer	-	1
Operative findings:		
Superficial	7	1
Intersphincteric	13	2
Transphincteric:		
Low	5	-
Mid	5	1
High	5	1
Suprasphincteric	2	1

Table II. Operations performed

	Fistulotomy	Loose seton	Advancement Flap	AP excision
Superficial	8			
Intersphincteric	15			
Transphincteric				
Low	5			
Mid	4	2		
High		5		1
Suprasphincteric		2	1	

Ten (23%) patients had complex fistulae. This included horseshoeing (n=4), more than one opening (n=6) and secondary extensions (n=7).

The external and internal openings were identified. The internal opening was in the posterior anal canal in 25 (58%) of cases, in the lateral canal in seven (16%) and in the anterior canal in 11 (26%). The external opening was in different positions around the anus.

Surgical treatment for each primary fistula track is shown in Table II. The commonest procedure performed was fistulotomy (n=32), 16 of which were also marsupialized.

All superficial and intersphincteric fistulae were layed open. Five out of 17 of transphincteric fistulae were of the low type and were also managed by laying them open. Regarding the mid transphincteric type, the approach was different and tailored to each patient individually depending on bowel habits, state of the sphincter on digital examination and the bulk of muscle above the internal opening. All four patients who had fistulotomy were males.

Permanent loose seton was applied for both females with mid transphincteric fistula. Also loose seton was applied for high and suprasphincteric fistulae. Two patients with Crohn's disease had loose seton for high transphincteric fistulae. One of them had previous fistulotomy for superficial fistula. One male patient with suprasphincteric fistula had endorectal advancement flap. One female patient that presented with perianal abscess and fistula-in-ano had also rectal bleeding. Digital rectal examination in the clinic showed a low rectal mass. Under general anaesthesia she had drainage of the abscess, biopsy of the mass and for control of the fistula a loose seton was inserted. She had a definitive surgery (abdominoperineal excision) later on for low rectal malignancy. Of the seven patients with loose setons (excluding two with Crohn's disease) three agreed to have endorectal advancement flap, they are on the waiting list. Horseshoe fistula track was noted in four patients and secondary extensions were seen in seven cases. In four out of seven cases the primary fistula track

Table III. Fistula surgery complications

Fistula type	Operation	Incontinence	Management
Superficial	Fistulotomy	Flatus incontinence	None
Intersphincteric	Fistulotomy	Soiling	Pads
	Fistulotomy	Flatus incontinence	None
Transsphincteric	Fistulotomy	Liquid stool	Loperamide
	Fistulotomy	Liquid stool	Loperamide
	Loose seton	Flatus incontinence	None
	Loose seton	Flatus incontinence	None

Table IV. Comparison of series

	Vasilevsky & Gordon 1984 (n . 160) ¹⁵	Malouf <i>et al</i> 2000 (n . 98) ⁴	Current audit (n=43)
Superficial	N/S	11%	18.6%
Intersphincteric	41.9%	31%	34.9%
Transsphincteric	52.1%	53%	39.5%
Suprasphincteric	1.3%	3%	3%
Extrasphincteric	0%	2%	0%

was layed open, with curettage of the secondary tracks. Three patients had loose seton for the primary track with secondary tracks laid open. Wound bridging requires further surgery in two patients. Fistula recurrence due to missed secondary tracks was seen in another two patients; they were low transsphincteric and were treated by fistulotomy.

During the follow-up period, two patient developed some degree of faecal incontinence; they were patients with mid transsphincteric fistula who had fistula surgery earlier. They had incontinence to liquid stool and were managed by antidiarrheal medications. One patient who had fistulotomy for superficial fistula developed mild incontinence to flatus; she was a patient with previous anal surgery (haemorrhoidectomy). Regarding patients that underwent lay open of intersphincteric fistulae, one developed soiling and the other had flatus incontinence. Patients that developed incontinence to flatus were patients with complex fistulae that had loose seton for the primary tract, and the secondary extensions were laid open (see Table III).

Wound healing was satisfactory in majority (40) of patients. An average time was six weeks (range 1-20). We had two recurrences in this study group; they were patients whose secondary tracks were missed during fistulotomy.

Discussion

A proper management of fistula-in-ano is an important aspect of colorectal practice. A better understanding of the anatomy of the fistula and anal sphincters allowed a more definitive treatment of complex fistulae. The anatomic distribution of

fistulae in the study patients is comparable to other studies^(5,18) (see Table IV) where the majority is transsphincteric fistulae followed by intersphincteric, and the least common is extrasphincteric fistulae.

The prevalence of fistula formation after drainage of an anorectal abscess is around 30%.⁽¹⁹⁾ Persistent discharges from the drainage site and/or recurrent abscess formation are usual indications that a fistula is present. A high prevalence of fistula formation after abscess drainage in this study (86%) is probably due to: first some abscesses are drained in the emergency department under local anesthesia and, second these abscesses are drained by a junior surgeon. These two reasons can carry a substantial risk of fistula formation.

A majority of anal fistulas have a single simple fistula track that is easily identified during surgery, and surgical treatment is generally successful. However, 5%–15%⁽²⁰⁾ of anal fistula tracks have a more complicated course, with secondary extensions outside the anal sphincter, often with horseshoe fistulas and ischioirectal and supralelevator abscesses. These so-called complex fistulas are often associated with recurrent fistulas and fistulas associated with underlying Crohn's disease. Failure in accurate assessment of the secondary extensions during surgery may be responsible for the high rate of recurrence.^(20,17)

We used magnetic resonance imaging, Short Tau Inversion Recovery (STIR) sequence, which suppresses signals from fat and highlights fistula, to identify secondary extensions and horseshoeing of the fistula in PHH patients. In contrast, endoanal sonography (EUS),⁽²¹⁾ sometimes complemented

with probing, is well comparable to bodycoil MRI in classifying and describing the topography of anal fistula.^(8,22) All eight patients in this study who had MRI, were the patients with previous surgeries for fistula. Scaring from previous surgery makes it difficult to outline the fistula tract manually.

The EUS examination is simple for the patient and can be performed by a surgeon with training in EUS.

Although the superficial type of fistula was not present in Parks classification,⁽⁴⁾ because of the emphasis on the intersphincteric plane. These are common and make up around 16% of one series.⁽¹⁹⁾ However; in this study series it is present in 16.2% of the study patients.

The best treatment for an anal fistula is to lay it open. Obviously if this involves cutting a large amount of anal sphincter this will cause incontinence. Bennett in 1962 said: '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 his fistula is healed'.⁽²³⁾

This study shows that most fistulae can be treated satisfactorily by lay-open techniques, even many mid trans-sphincteric fistulae in which a seemingly substantial part of the external sphincter is divided. Sir Alan Parks, in his classic paper, stated that 'as a general rule the whole of the internal and most of the external sphincter can be cut, with the exception of the puborectalis muscle, without any serious loss of function'.⁽⁴⁾ One centimetre of normal sphincter muscle above the internal opening may be sufficient for the primary track to be laid open.⁽²⁴⁾ This is most applicable to males with no history of previous fistula surgery or perineal surgery but should be adopted with caution in females whose anterior external sphincter and anal canal have been demonstrated to be shorter, and often harbor occult obstetric injury.⁽⁵⁾

Nine patients in this study had permanent loose seton, it is another definite treatment of complex fistulae. However three out of seven patients (excluding two patients with Crohn's) with loose seton are waiting for the endorectal advancement flap procedure.

One male patient with suprasphincteric fistula in this audit represented a high risk for fistulotomy and was managed by endorectal advancement flap. He had no symptoms of faecal incontinence.

Advancement flaps are usually employed where cure is sought but yet where fistulotomy might

compromise function too much. Mizrahi *et al*⁽²⁵⁾ showed that the success rate of the endorectal advancement flap is modest at a follow-up of up to 12 years. The only factor predictor of failure is a diagnosis of Crohn's disease. However, female gender, a rectovaginal location, or the prior performance of two or more repairs may also predispose to failure.

Different management procedures for the horseshoeing of the fistula is dependant on the level of crossing of the primary tract in the external sphincter muscle (where there is mid to high cross a loose seton was applied other wise fistulotomy was performed).

Marsupialization of anal fistulotomy wounds leaves less raw unepithelialized tissue to granulate and may improve wound healing. Ho *et al*.⁽²⁶⁾ concluded that marsupialization of fistulotomy wounds resulted in more rapid healing and less deformed wounds. This is why 50% of the study patients who underwent fistulotomy had also marsupialization of the wound.

Risk factors for developing incontinence after fistula surgery are well-documented⁽²⁷⁾ and these can usually be identified by clinical assessment. Manometry is advocated by some to help direct the surgical approach and therefore prevent incontinence developing after fistula surgery,⁽²⁸⁾ however, its routine use is by no means universal practice. Whilst maintenance of the anorectal ring was previously considered the only necessity to maintain continence after fistulotomy, high external anal sphincter division which may occur with transsphincteric fistulas may lead to impaired continence, associated with lower distal anal canal pressure.⁽²⁹⁾

Because of the unavailability of the anal manometer in PHH, we could not predict patients who may develop incontinence after the surgery. In a prospective study by Lunniss *et al*.⁽³⁰⁾ nineteen of 37 patients undergoing fistulotomy noted minor degrees of incontinence postoperatively. In contrast only eight of 43 in this audit had incontinence postoperatively. This may be explained by less complicated fistulas in this series and more conservative approach in the treatment, reflecting by using a loose setons for high fistulas.

Fistula may recur due to failure of technique such as advancement flap, further sepsis caused by skin bridging, or failure to detect and eradicate all tracks and openings at initial surgery. The reported incidence of success in this kind of operations is

between 46-100%⁽³¹⁾ with the incidence of incontinence from 0-35%.

Two cases of recurrence in this audit were in patients who had secondary extensions that were missed initially. Few reports of long-term follow-up and recurrence exist. An average follow-up of just over three years of 160 patients reported a recurrence rate of 6.3%,^(15,18) most often seen in those patients in whom high blind tracks were evident at EUA. A distinction must be made between true recurrence following treatment and persistence of fistulae resulting from inaccurate assessment. The overall recurrence in our series was 4.7%.

We used loose setons in nine patients, usually for more difficult fistulas and patients with Crohn's disease. Such an approach allows initial drainage of sepsis prior to subsequent definitive treatment to eradicate the fistula. Approximately 50% of fistulae will heal after seton removal without external sphincter division, and this can be performed when the external opening of the fistula has closed around the seton approximately three months after insertion.⁽³²⁾

Conclusion

Fistula-in-ano is fairly common in Jordan, its variations in its anatomical distribution led to a wide range of available treatment options, but fistulotomy is the commonest acceptable method, it gave excellent results in the majority of cases, but it carries a risk of minor incontinence. Sphincter saving procedures like advancement flap is an alternative option, but it is technically demanding, and can cure fistula with no or minimal disturbance in continence.

The more complex and difficult the fistula, the more complex surgical option should be applied, and the more experienced general or colorectal surgeon should perform it.

Fistula in association with Crohn's disease should be managed as much conservatively as possible. Other modalities in treatment of fistula like plugs and glues should be kept in mind.

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