

Management of Fistula-in-Ano at King Hussein Medical Center

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ABSTRACT

Objective: To describe the treatment of fistula-in-ano in the newly formed colorectal unit at King Hussein Medical Center.

Methods: This is a descriptive, retrospective review of case medical records of 91 patients with different types of fistula-in-ano treated surgically between March 2009 and May 2011. Anatomic classification and operative procedure of all fistulae were recorded.

Results: Eighty-five patients underwent surgery for fistula-in-ano. There were 93 fistulae in our study group; with eight patients having two fistulae tracts. There were 76 (89%) males, with a mean age of 39.1 years (range 19-76). Eleven patients had superficial, 5 patients had inter-sphincteric, 68 patients had trans-sphincteric, 3 patients had supra-sphincteric and 5 patients had extra-sphincteric fistulae. Thirty-eight patients (45%) had complex fistulae. The radial site of fistulae was detected, with 44 (47%) presenting with an internal opening in the posterior anal canal, 19 (21%) opening into the anterior canal and 30 (32%) opening laterally. Fistulotomy was the commonest procedure (n=40) with marsupialization in 20 patients, followed by loose Seton (n=33), endorectal advancement flap (n=5), tight Seton (n=4) and ligation of the intersphincteric fistula tract (LIFT) procedure (n=2).

Conclusions: Careful selection of the treatment method that takes into account the anatomy of the fistula, state of the anal sphincters and patient's preference is central in the successful management of fistula-in-ano.

Key words: Fistula-in-ano, Management, King Hussein Medical Center.

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Introduction

Fistula-in-ano is relatively a common condition in surgical practice; it is defined by an abnormal communication between two epithelium-lined surfaces, usually the anal canal to the perianal skin. Most fistulas are thought to arise as a result of crypto glandular infection. Other less common causes of fistulae are Crohn's disease, trauma, anal fissures, carcinoma, radiation therapy,

tuberculosis, and chlamydial infections.⁽¹⁾

The treatment of anal fistulas is various because no single technique is generally effective. The principles of fistula surgery are to eliminate the fistula, preserve sphincter function and prevent recurrence. Surgical strategies to treat fistulae tend to be guided by their degree of complexity and their underlying aetiology. Fistulotomy, through division of the sphincter muscle fibres

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encircling the tract, remains the most effective way of eradicating this pathology. The reported success rates for simple fistulae are between 92% and 97%, with postoperative alteration in continence in up to 73% of patients.⁽²⁾ Additionally, recurrence of the fistula tract after fistulotomy has been reported to be as high as 54%.^(3,4)

Fistulas that course through significant amounts of sphincter muscle, anterior fistulas in women, and fistulas associated with inflammatory bowel disease or weakened sphincter muscles, however, cannot be opened entirely, because incontinence will result. These fistulas may be partially opened, with the anal musculature left intact and encircled with a loose or cutting Seton.⁽⁵⁾ The cutting Seton has been shown to be associated with 80% to 100% healing rate and 0% to a 92% incontinence rate.⁽⁶⁾ Another surgical option is to close the internal fistula opening with an advancement flap. However, these procedures are often technically challenging and the recurrence rate is in the range of 52%. Although the sphincter complex is not divided, the reported mild to moderate incontinence is up to 7-38%.^(2,7)

Other sphincter saving treatment modalities such as fibrin glue, anal fistula plug and recently introduced ligation of the intersphincteric fistula tract LIFT procedure has been advocated for management of fistula-in-ano with diverse results. Fibrin glue injection was a promising therapy that minimized incontinence risk; however, long-term results have been disappointing.⁽⁸⁾ Closure of cryptoglandular anorectal fistula tracts using the anal fistula plug is safe with reported success rates in approximately 54% for both cryptoglandular⁽⁹⁾ and Crohn's related complex anal fistulas^(10,11) with no reports of altered incontinence.⁽¹²⁾

The main concept in the LIFT is to identify the fistula tract in the intersphincteric space and the subsequent division and ligation of the tract. A success rate of 94% was reported; importantly, there were no issues with incontinence.⁽¹³⁾

The aim of our study is to present our data on surgical management of fistula-in-ano at our newly formed colorectal unit.

Methods

A retrospective analysis of consecutive patients who underwent surgery for fistula-in-ano at King

Hussein Medical Center was conducted between March 2009 and May 2011. All patients who underwent examination under anesthesia for fistula-in-ano were included in the study.

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. All patients underwent examination under anesthesia in the lithotomy position with intravenous antibiotics administered on induction of anesthesia. A specially designed medical records abstract form was used to describe the relevant operative findings. (Fig. 1). Fistulae were classified on the basis of operative findings and according to Parks' classification.⁽¹⁴⁾ A high fistula was defined as one encompassing more than one-third of the external sphincter complex.^(15,16)

Name	Hospital Number	Date		
DESCRIPTION				
PRIMARY TRACK				
superficial				
inter-sphincteric				
trans-sphincteric				
supra-sphincteric				
extra-sphincteric				
INTERNAL OPENING				
Site o'clock				
Level - below				
at dentate line				
above rectum				
EXTERNAL OPENING (S)				
Number				
Sites o'clock				
HORSE-SHOEING				
inter-sphincteric				
infra-levator (in ischiorectal fossa)				
supra-levator				
ABSCESS				
superficial				
inter-sphincteric				
infra-levator (in ischiorectal fossa)				
supra-levator				
OTHER ANAL CONDITIONS				
Fissure				
Haemorrhoids				

Fig. 1: Fistula operation note.

Localization of the internal opening was gently attempted using fistula or lacrimal probes. If cannulation was unsuccessful, the fistula tract was injected with hydrogen peroxide solution through the external opening.

Treatment was initiated according to the site of the fistula, its primary and secondary tracks and state of the sphincters. Three surgeons performed the procedures. Fistula was laid open if one third or less of external sphincter was embraced by the fistula, excluding anterior fistula in females, multiple fistulae in one patient, weak sphincters in the elderly and fistula in Crohn's patient. Loose Seton was applied if in addition to fistula perianal sepsis was present, or the patient had multiple fistula surgeries and the state of the anal sphincters was unsatisfactory or in patients with Crohn's disease. Fibrin glue was used on availability, and tight Seton was used on discretion of the treating surgeon. Endorectal advancement flap was used as a definite surgery to close the internal opening in high fistulae. The surgical technique for endorectal advancement flap has been previously described.^(17,18) Briefly, under general anesthesia, the patient was placed in the lithotomy position. A partial-thickness flap consisting of mucosa, submucosa, and part of the internal anal sphincter or full-thickness (including all the thickness of the internal sphincter) flap was mobilized from the level of the dentate line to three to five cm cephalad. The base of the flap was at least twice as wide as its apex to ensure adequate blood supply to the distal end. The fistula tract was curetted and the mucosa of the internal opening excised. The internal opening was suture closed, and then the edge of the flap was advanced onto the dentate line and sutured without tension over the internal opening, using absorbable sutures.

LIFT procedure has been introduced newly at our department. For this technique, the patient is placed in the lithotomy position. General or regional anesthetic was used based on patient and anesthesiologist preference and all received appropriate preoperative intravenous antibiotics. The fistula tract is delineated and the internal opening identified by use of a fistula probe or hydrogen peroxide injection into the external opening. The intersphincteric groove is identified and marked with the probe in place. An incision (1–2 cm) is made directly over the groove. The

intersphincteric space is entered and, with the external sphincter retracted laterally and the internal sphincter retracted medially, a blunt dissection is made in the intersphincteric plane down to and around the fistula tract. Langenbeck retractors are used to assist in the exposure. The fistula tract is then hooked with the use of a right-angled clamp, a stay suture using 2.0 absorbable suture (Vicryl) is placed in the medial portion of the fistula tract adjacent to the internal sphincter muscle, and the tract is divided just lateral to the stay suture. A part of the fistula tract is dissected and partially excised on the external sphincter side (approximately 1 cm). The stay suture on the internal sphincter side of the tract is then used to close the tract opening in a figure-of-eight fashion. Then, the external sphincter side is closed in a similar fashion. The intersphincteric incision site is irrigated, and closed in layers (muscle and skin layers) with use of 3.0 absorbable suture in an interrupted fashion. The external opening is widened, and the tract on the skin is cleared using a curette and left open for drainage.

The T student test was used to compare different proportions. $P < 0.05$ was considered significant.

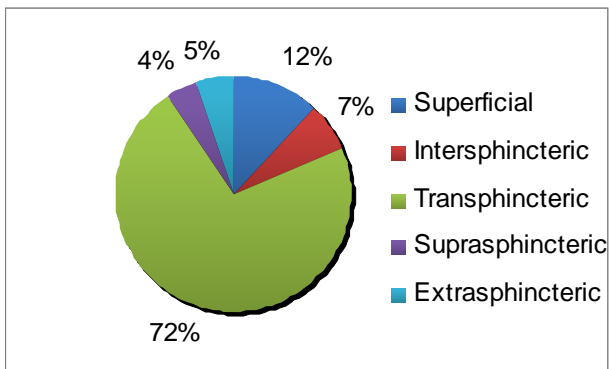
Results

Between March 2009 and May 2011, 85 patients underwent surgery for fistula-in-ano after excluding 5 patients because of incomplete data and one patient with perineal hydradenitis suppurativa. There were 76 (89%) males and nine (11%) females. Their mean age was 39.1 years (range 19-76), with mean female age 32.6 years and mean male age of 40 years, ($P=0.03$). There were 93 fistulae in our study group; with 8 patients has two fistulae tracts. Eleven patients (0 female, 11 males) had superficial fistula, 5 patients (0 female, 5 males) had inter-sphincteric, 68 patients (10 females, 58 males) had trans-sphincteric, 3 patients (0 females, 3 males) had supra-sphincteric and 5 patients (0 female, 5 males) had extra-sphincteric fistulae (Table I and Fig. 2).

Thirty-eight patients (45%) had complex fistulae, defined by⁽¹⁹⁾ the presence of more than one external opening ($n=12$), horseshoeing ($n=14$), and an abscess cavity not directly related to the primary track ($n=22$).

Table I: Patients' characteristics and fistula anatomy.

	Male	Female	P
Number of patients	76	9	
Mean age	40	32.6	0.03
Fistula classification:			
Superficial	9	0	
Intersphincteric	5	0	
Trans-sphincteric:	54	9	
Low	21	5	
Mid	16	3	
High	17	1	
Supra-sphincteric	3	0	
Extra-sphincteric	5	0	
Internal opening:			
Below dentate line	6	2	NS
At dentate line	60	7	<0.001
Above dentate line	4	0	
Rectum	6	0	

**Fig. 2:** Fistulae classification.**Table II:** Fistula characteristics.

	Male	Female	P
Horseshoeing:			
Infralevator	14	1	
Supralevator	2	0	
Abscess:			
Infralevator	11	2	0.003
Supralevator	10	0	
Superficial	1	0	
Inter-sphincteric	1	0	

Table III: Operations performed.

	Fistulotomy	Tight Seton	Loose Seton	LIFT	Endorectal advancement flap	Other
Superficial	10					
Intersphincteric	5					
Trans-sphincteric						
Low	25					2
Mid		4	14	2		1
High			13		5	
Supra-sphincteric			3			
Extra-sphincteric			3			2

The radial site of fistulae was detected, with 44 (47%) presenting with an internal opening in the posterior anal canal, 19 (21%) opening into the anterior canal and 30 (32%) opening laterally. Most common site of the internal opening was at the dentate line (n=75), followed by below the dentate line (n=8), in the rectum (n=6) and above the dentate line in the anal canal (n=4). The external opening was in different positions around the anus. Horseshoeing of the fistula tract was present in 15 patients; 13 had infralevator and 2 had supralevator horseshoeing, Table II. In addition to fistula-in-ano, there were 25 abscesses in 22 patients. Most common was infralevator abscess in 13 patients, followed by supralevator in 10 patients, and superficial and intersphincteric abscesses, one each (Table II).

Surgical treatment of the fistula is shown in Table III. The commonest procedure performed was fistulotomy (n=40) of which 20 were marsupialized. All superficial and intersphincteric fistulae and 25 of low trans-sphincteric were laid open of which one (low trans-sphincteric) fistula had developed after previous sphincter repair. Mid-trans-sphincteric fistulae were managed either by loose Seton (n=14), tight Seton (n=4) or LIFT procedure (n=2). High trans-sphincteric fistulae, however, were managed either by loose Seton (n=13) or endorectal advancement flap (n=5). Supra- and extra-sphincteric fistulae, all were treated with loose Seton or drains.

Of the 38 patients with complex fistulae, 25 had loose Seton, 7 patients had fistulotomy with or without marsupialization, 3 patients had core-out fistulectomy with endorectal advancement flap closure of the internal opening and 2 patients had tight Seton placement.

A total of 33 patients had placement of loose Seton, usually for complex fistulae (n=25). In the majority of patients, loose Seton was a temporary procedure to control perianal sepsis or to define high fistulae tracts, and all were scheduled for definitive surgeries, either endorectal advancement flap or LIFT procedure. Permanent loose Seton was applied for one patient with Crohn's disease who had complex (high trans-sphincteric and extra-sphincteric) fistulae with horseshoeing. One patient had his fistula treated with fibrin glue, he developed severe perianal sepsis and therefore the glue was curreted and

loose Seton applied.

Five patients had endorectal advancement flap closure of the internal opening, all for high trans-sphincteric fistulae. In one patient the flap was retracted on day four and he was taken back to the operating theatre and loose Seton inserted. The remaining four patients recovered uneventfully.

LIFT procedure was performed for two patients with mid trans-sphincteric fistulae. This procedure was performed for the first time at our Department. One patient had extra-sphincteric fistula and multiple external openings with ischio-rectum filled with gelatinous (mucin) material, he was managed with loose Seton. Multiple biopsies result confirmed adenocarcinoma and he was managed accordingly.

Another patient with suspicion of rectal cancer had two high trans-sphincteric fistulae, one opened into the rectum. Again, he was managed with loose Seton; multiple biopsies confirmed absence of malignancy.

Other procedures included: Seton change, abscess drainage and examination under anesthesia without any surgical intervention (n=1) because of severely distorted anus due to multiple previous surgeries and the tract could not be manipulated.

In addition to fistula surgery, four patients had rubber band ligation of internal hemorrhoids.

Discussion

Surgery is the mainstay treatment of fistula-in-ano, and a proper management of this condition is an important aspect of colorectal practice that depends upon accurate knowledge of the anal sphincter topography and the surgical anatomy of the fistula. Failure to understand either may result in recurrence or incontinence. Therefore, the principles of fistula surgery are to eliminate the fistula, prevent recurrence, and preserve sphincter function.

Fistulotomy is the classic operation for anal fistulae. It was first described in the 14th century by John Arderne.⁽²⁰⁾ It is the best treatment in terms of absolute cure.⁽²¹⁾ However, this method of treatment should be approached with caution since it involves muscle cutting. Therefore, it is mandatory to have a good topographic view of the fistula tract and how much muscle it engulfs,

and adequate evaluation of the state of the sphincters either by history, physical examination or different tests has been performed. It is clear that a high or complex fistulae should not be laid open and that low or simple fistulae can be laid open with minimal functional consequences. It is the mid trans-sphincteric fistula that causes the most concern and difficulty in deciding whether to lay open or to place a Seton. If in doubt, always place a loose Seton, especially if a full discussion with the patient regarding possible complications of muscle division has not taken place. All superficial, intersphincteric and low trans-sphincteric fistulae in our study were laid open. However, Malouf *et al.*⁽¹⁹⁾ had 13 mid and one high trans-sphincteric fistulae treated by fistulotomy with some degree of fecal incontinence.

Only 4 patients were treated using cutting Seton because of the pain and inconvenience it carries. Moreover, Goldberg reported a relatively high incidence of functional morbidity, major in one patient and minor in a further seven patients (54%) with incontinence of flatus or episodic loss of liquid stool in 13 patients with trans-sphincteric fistulae treated with cutting Seton.⁽²²⁾ When it comes to complex and high fistulae we preferred less aggressive approach. We believe that cultural and religious characteristics of our society mandate more conservative approach to avoid any sort of incontinence and soiling.

Thirty three patients had loose Seton inserted. All were for high fistulae and the indications were to control perianal sepsis, in patients with Crohn's disease and to delineate the fistula tract as temporary measure before planning any future definite surgery, *i.e.* sphincter sparing surgery or excision of malignancy if confirmed by histopathology investigation. We had two patients presented with complex perianal fistulae were suspected of having rectal cancer, which was confirmed in one patient.

Rectal cancer can present with perianal fistulae, also cancer can develop in long standing fistula-in-ano.⁽²³⁾ It is important to have high level of suspicion when unusual looking fistulae are encountered; in these cases multiple biopsies of the fistula and surrounding tissues should be performed,⁽²⁴⁾ and the entire colon should be evaluated when perianal malignancy is confirmed.

Various conservative sphincter-sparing treatments can also be used for the treatment of fistula-in-ano; for example, endorectal advancement flap,⁽²⁵⁾ fibrin glue injection,⁽²⁶⁾ anal fistula collagen plug,^(11,27) or more recently, ligation of the inter-sphincteric fistula tract.^(13,28)

Success rates reported in the literature vary widely, and all in all, none of the approaches has been proven to be superior for all comers.⁽²⁹⁾

Soltani *et al.*⁽²⁵⁾ in their review of endorectal advancement flap for the treatment of cryptoglandular or Crohn's fistula noticed that full thickness flaps were associated with below-average outcome compared to partial thickness flaps. In our study, four patients were successfully treated with endorectal advancement flap; all had partial (mucosa and part of internal sphincter) thickness flap. In one patient with full thickness (mucosa and the entire internal sphincter) flap the surgery failed (the flap retracted on day four) and he had Seton insertion. However, our observation cannot be generalized because of small number of patients and unavailability to date of the follow up results.

Fibrin glue was tried on one patient with poor results; he developed severe perianal sepsis that required curettage of the glue, Seton insertion and intravenous antibiotics.

The recently described sphincter saving procedure, *i.e.* ligation of the intersphincteric fistula tract⁽¹³⁾ was adopted on two patients. No conclusions can yet be brought forward; nevertheless, Rojanasakul *et al.*⁽¹³⁾ who first explained this procedure reported a 94% success rate in 17 patients. On the other hand, Bleier *et al.*⁽²⁸⁾ reported a success rate of 57% (22 out of 39 patients). In both studies few weaknesses are presented, such as selection bias, different fistula ligation techniques, short time of follow up and unavailability of standardized questionnaires to measure faecal incontinence and quality of life. However, the strengths of this technique should not be overlooked, such as easy to learn, minimal morbidity, no reported incontinence and most importantly if surgery failed, patients are no worse after than they were before the operation.

Conclusion

The management of anal fistulas continues to be a challenge to colorectal surgeons worldwide.

Because no single treatment is universal for this condition; the treating surgeon should have expertise in wide range of different surgical procedures for the management of fistula-in-ano. Deep understanding of the anatomy of the fistula is also mandatory for effective treatment and avoidance of recurrences and incontinence.

Our study described the different surgical techniques used for the treatment of fistula-in-ano; however, a randomised study comparing these techniques, taking into account healing, recurrence and incontinence rates and quality of life is mandatory to have any solid conclusions regarding the most suitable procedure.

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