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REVIEW ARTICLE

One stage fistulectomy for high anal fistula with reconstruction of anal sphincter without fecal diversion

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Summary Perianal sepsis and fistula is a troublesome disease in the field of colorectal surgery in term of recurrence and fecal incontinence. The aim of our study is to evaluate the role of 'one stage complex anal fistula excision with reconstruction of anal sphincter without stool diversion' regarding fecal incontinence and recurrence. This was prospective cohort study on 175 patients of complex high peri-anal fistulae, the patients were subjected to fistulectomy and reconstruction (primary suture repair) of anal sphincter without stool diversion, the patients were followed up 1 year postoperatively after complete healing of the wound regarding their continence to stool and gases using Wexner score and recurrence of the fistula which is examined clinically and radio-logically using MRI. Among the 175 patients only four had developed fecal incontinence with varying degrees in which 2 patients developed gas incontinence and 2 patients developed soiling, after 3 months 8 patients had recurrence and after 6–9 months 6 patients developed recurrence . Also at the end of follow up period upon performing the confirmatory MRI, 2 patients showed hidden fistulous tracts ending into a high abscess cavity. This ends up into total of 16 recurrent cases. Five patients experienced delayed wound healing. In conclusion, Compared to other treatment modalities for complex anal fistula found in literature, it had been found that one stage surgery (fistulectomy with primary sphincter repair) has good results regarding healing of the fistula with low risk of incontinence, low recurrence rate and good wound healing.

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1. Introduction

A fistula is an abnormal connection between two epithelialized surfaces, and is lined with granulation tissue. A perianal fistula is a fistulous tract between anal canal or rectum and the skin around the anal verge (anal fistula). Anal fistula is one of the perianal sepsis conditions. Usually, it is developed after an ano-rectal abscess which may cause various symptoms such as pain, itching and discharge.[1] Anal fistulae affect 1 in 10,000 of the normal population every year.[2] Eighty percent of anal fistulae are secondary to cryptogenic abscesses arising from infected anal glands which then can spread to other parts of the perianal region. Infection can then track in many directions to other epithelized surfaces such as vagina forming ano-vaginal fistula or perianal skin forming perianal fistula.[2]

The treatment of anal fistulas is a major therapeutic challenge. The main challenge is to eradicate the inflammatory process to minimize the incidence of recurrence without affecting anal continence. Normal continence is maintained by complex interaction of the anal sphincter muscles and pelvic floor innervations.[3] Nowadays, cutting and noncutting procedures are used in the treatment of anal fistulae with recurrence rates between 0 and 65% and postoperative incontinence between 0 and 63%. With more radical approaches, the recurrence rate decreases, but the risk of incontinence increases.[4] Fistulotomy has been described as the treatment of choice for subcutaneous and inter-sphincteric anal fistulas with or without marsupialization with very good healing rates. However, the risk of incontinence rises with the amount of external sphincter muscle that has been divided.[4]

For fistulectomy with primary sphincter reconstruction (FPSR) as a cutting procedure, promising results, in a small number of publications, were found especially for patients with pre-existing incontinence due to former therapies.[5]

1.1. Aim of the study

The aim of this study is to access feasibility of one stage fistulectomy with primary reconstruction of anal sphincter to permanently eliminate high trans-sphincteric and supra-sphincteric anal fistula to achieve healing while preserving anal canal function and continence.

2. Study methods and material

2.1. Study design

This was a prospective cohort study.

2.2. Population of study & disease condition

One hundred seventy five patients, 112 males and 63 females, between the ages of 18 and 60 years diagnosed with high anal fistula.

2.3. Inclusion criteria

The following patients were included in the study:

Patients with high complex trans-sphincteric anal fistula. We mean by high complex fistula is the high trans-sphincteric perianal fistulae which we define as the fistulae which involve more than 50% of the external anal sphincter and the supra-sphincteric perianal fistulae which we define as the fistulae which extended completely above the external anal sphincter.

2.4. Exclusion criteria

The following patients were excluded from the study:

1. Patients with simple anal fistula.
2. Patients with preoperative incontinence.
3. Patients with comorbidity and chronic illness affecting healing process such as, patients diagnosed with any immune system compromising disease and patients diagnosed with chronic inflammatory bowel diseases.
4. Patients diagnosed with acute anal sepsis.

2.5. Methodology in details

The study group included 175 consecutive patients (112 male and 63 female), diagnosed with high trans-sphincteric and supra-sphincteric anal fistulae between ages from 18 to 60 years old presenting to the Colorectal unit, Cairo university hospitals in the period from March 2016 to August 2017. Proper history was taken regarding any previous illnesses or comorbidity especially immune compromised condition or chronic inflammatory bowel diseases and previous anal surgery. General examination to assess patient's fitness for surgery then local digital per rectal examination was commenced for assessment of anal canal continence and identification of external and internal openings. M.R.I. Fistulogram (look Fig. 1) was used as a standard method for proper identification of the fistulous tract and its relation to the sphincter complex to select the patients which fall under our inclusion criteria. Also all patients were accessed for continence using Wexner score for incontinence before the operation, any patient with impaired fecal continence were excluded from the study.

2.6. Preoperative

All patients signed an informed consent before operation regarding operative steps and complications. All patients had had bowel preparation with rectal enema the night before the operation.

2.7. Operative-technique

Patients were anaesthetized with general anesthesia, put in lithotomy position and the skin was then draped. After identification of the external fistula orifice probing of the

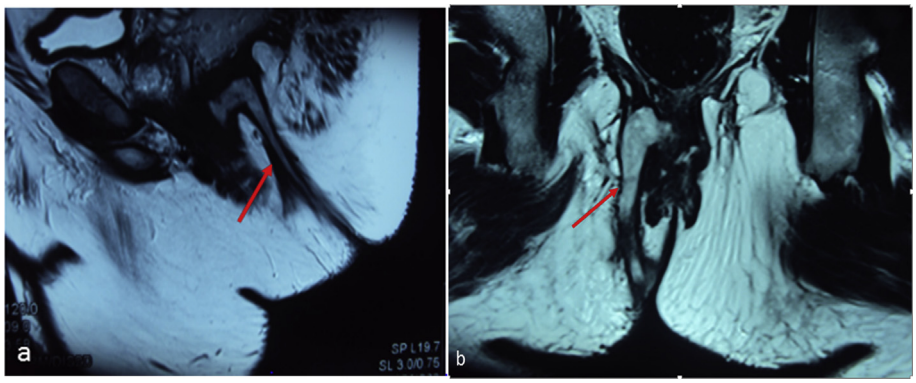

Figure 1 MRI fistulogram for a high trans-sphincteric fistula (red arrows): a) Sagittal, b) Coronal.

Figure 2 Fistula layed open then excised (fistulectomy).

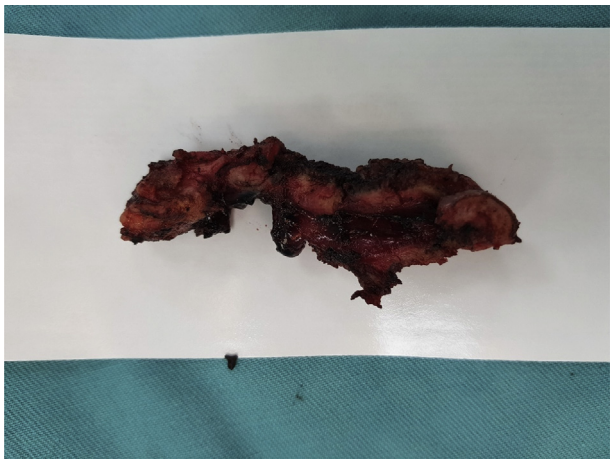

Figure 4 Fistula after excision.

fistula tract with identification of the fistulous tract and internal orifice by injecting of diluted methylene blue in the tract. Fistula was laid open and fistulectomy then conducted and dissected with diathermy cautery help (Fig. 2). Then Primary repair-without overlap-of the sphincter with Vicryl 2/0 with proper hemostasis using coagulation diathermy then injection of local anesthetic for post-operative pain control (look Fig. 3). All excised tissue were sent for histo-pathological examination (Fig. 4). All the surgeries were performed by one surgeon who has a high consultant level as the head of the colo-rectal unit in Cairo University.

2.8. Post-operative

All patients were kept during the post-operative period on antibiotic and proper pain killer. Perianal cleansing was done with a sitz bath after each bowel motion. After discharge from the hospital, sitz bath continued every 8 h on daily bases and after every bowel motion.

Follow up was done every two weeks for the 1st 2 months and then follow up was commenced monthly for 1 year. Clinical assessment of recurrence and anal incontinence.- After 1 year, full assessment for fistula recurrence and anal continence was done by full clinical examination and by

Figure 3 Muscle repair after excision of the fistula.

Table 1

1-Age	Min.	Max.	Mean
	18	60	37.48
2- Gender (total = 175)	Males 112 (64%)		Females 63 (34%)
3- Recurrence	Number of recurrent cases 16		Percentage 9.1%
4- Continence	Incontinent cases. 4		Percentage 2.28%
5- Wound healing	Delayed (up to 8 weeks) 5		Percentage 2.85%

using Wexner score.[6] Also at the end of the follow up period MRI Fistulogram was done again for all patients to ensure the absence of hidden recurrences that cannot be detected clinically. It worth saying that this study was conducted initially on 198 patient, however 23 patients did not complete their follow up and they were excluded them from the study. This ends up into the above mentioned 175 patients.

3. Results

3.1. Demographic and descriptive data

The study was conducted on a total of 175 patients with age limit (18–60) with 112 males and 63 females. Age and gender distribution are shown in Table 1.

3.2. Clinical data

3.2.1. Recurrent cases

The patients were followed up to 1 year, after 3 months 8 patients had recurrence. Seven of those patients recur with high trans-sphincteric fistulae and 1 patient recur with low branching trans-sphincteric fistula. After 6–9 months 4 patients develop recurrence in the form of high trans-sphincteric fistulae and 2 patients developed low fistulae. At the end of follow up period upon performing the confirmatory MRI, 2 patients showed hidden fistulous tracts ending into a high abscess cavity, those patients were complaining of vague anal pain with no visible external opening. This ends up into total of 16 recurrent cases. This is shown in Table 1.

3.2.2. Incontinence

Four patients (2.3%) were complicated with incontinence. Two of those 4 patients (1 male and 1 female) experienced gas incontinence two months postoperatively (score 3 in Wexner), the patients have responded well to biofeedback and regain continence after 2 months of biofeedback. The histo-pathological examination of the fistulous tract revealed chronic nonspecific inflammation for both patients. The other 2 male patients experienced soiling (Wexner's score 4) which was investigated and treated accordingly, this is shown in Table 1.

3.2.3. Wound healing

Five patients (2.85%) had experienced a delay in the wound healing (more than 8 week) the rest of the patient had average time of wound healing around 3–4 week. The histopathological examination results for the patients who experienced the delayed healing process showed two patients with Crohn's disease, two with hidradenitis suppurativa and one with non-specific inflammation. The 2 cases of Chron's disease and the case of non-specific inflammation developed recurrence of the perianal fistula. This is shown in Table 1.

3.2.4. Analysis after exclusion of specific pathology

If the patients who had an un-diagnosed specific disease as Chron's disease and hidradenitis suppurativa are excluded from the analysis of the results, the recurrent cases will decrease to 14 cases as there were 2 cases from the 16 recurrent cases had Chron's disease. Also the number of patients with delayed wound healing will fall to 1 case as out of the 5 patients who experienced delayed wound healing 2 patients were diagnosed as Chron's disease and 2 patients with were diagnosed as hidradenitis suppurativa (look Table 1).

4. Discussion

In this manuscript we try to study the safety of fistulectomy of complex high trans-sphincteric and supra-sphincteric perianal fistula with 1ry sphincter repair in terms of recurrence and fecal incontinence. Our study shows low incidence of recurrence (9.1%) and incontinence (2.28%) after the procedure. Also our study showed low incidence of delayed wound healing up to 8 weeks (2.85%).

Although anal fistulae are very common problem which have been extensively studied, some complex forms still represent a challenging surgical problem. The aim of surgery for anal fistulae is to completely and permanently eliminate all sepsis, achieve healing and minimize incidence of recurrence while preserving anal function and continence.[7] The surgical treatment may vary depending on the preoperative classification of the fistula and its relationship to the sphincters.[8]

Traditionally, fistulae were laid open allowing healing to start from the base. In this type of operation, the higher the fistula, the more muscle that is cut which may result in incontinence. Aggressive fistulotomy can lead to postoperative fecal incontinence, while on the other hand, inappropriate conservative treatment could result in fistula recurrence.[9] The more proximally the track crosses the sphincter, the greater will be the resulting impairment of continence. Division of more than 30–50% of the external sphincter probably results in a significant functional deficit.[10]

In 2010 Soltani A and Kaiser AM stated that in the treatment of trans-sphincteric anal fistulas, many therapeutic options have been described but many of them did not fully meets the criteria of a safe optimum procedure which should have high healing rate, a low rate of recurrence, and no impact on continence.[11]

In 1985 Parkash S and colleagues, in an attempt to reduce this high rate of continence impairment, they describe the immediate reconstruction of the sphincters after fistulotomy.[12]

In study on 33 patients in 2009, core out fistulectomy with anal sphincter reconstruction and primary closure of internal opening showed good functional outcomes and no disturbance of continence.[13] This study agree with our study with showed low incidence of recurrence and incontinence.

Also our results agree with a study conducted by Arroyo A and colleagues recently in 2012. However, the recurrence rate in their study was 8.6% while it was 9.1% % in our study. Also they described an improvement of incontinence in patients complicated with minor incontinence.[4]

Fistula surgery is either conservative at the expense of recurrence or aggressive at the expense of continence. We think that if this technique is done with an expert colorectal surgeon, it will solve that major problem minimizing recurrence rate while preserving the function of the sphincter maintaining continence.

We also think direct sphincter repair is preferable to overlap repair because the later cause undue tension on the repair with increase intra-anal pressure and it avoids excessive dissection leader to sphincter ischemia. Also, we believe that muscle repair following the aggressive fistula surgery and muscle division addresses the issues of recurrence and incontinence at the same setting with very acceptable results even in patients with pre-operative anal incontinence.

5. Conclusion

Compared to other treatment modalities for complex trans-sphincteric anal fistula found in literature, it had been found that one stage surgery (fistulectomy with primary sphincter repair) has good results regarding healing of the fistula with acceptable risk of incontinence, relatively recurrence rate and good wound healing. However limitations of this study is the need of longer period of follow up that may reach 2 years which may increase the recurrence rate.

Ethical committee approval

The study was approved by the Research Ethics Committee of Cairo University.

Conflict of interest

The authors declare that there is no conflict of interest.

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