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# Different Surgical Techniques in Management of High Fistula in Ano

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**Abstract:**

**Objective:** The major objectives in the management of fistulae are to drain sepsis, to define and eradicate the fistulous tract, and to preserve sphincter integrity and function. For these reasons many surgical techniques are described in medical literature, but their outcomes with respect to recurrence and incontinence rates are still under debate.

**Patients and methods:** This study was conducted on 75 patients with high anal fistulae who were admitted to Sohag University Hospital in the period from October 2003 to July 2005.All patients were subjected to the following preoperative evaluation including: full history taking, anorectal examination and preoperative special investigations as fistulogram to all patients, magnetic resonance imaging (MRI) in recurrent cases and preoperative biopsy whenever indicated. Patients were divided into 3 equal groups; each group included 25 patients and treated randomly by certain surgical modality as follows: group A treated by cutting seton, group B treated by core fistulectomy and advancement flap and group C treated by autologous fibrin glue injection after curettage of the fistulous tract and drainage of the external opening. Comparative Evaluation of postoperative outcome was performed as regards recurrence, incontinence and other complications.

**Results**: The mean age was 37.45 years (range from 10 - 74 years). There were 65 males (86.67%) and 10 females (13.33 %). Purulent discharge was the most common symptom (69%). Analysis of the history of our series showed that 23 patients (30.7%) were previously operated upon for anal fistula. Intra-operative assessment of the fistulous tract was accurate in detection of type of fistula in 72 patients (96%), site of internal opening in 71 (94%) and detection of side tracts in 69 (92%). Our patients were categorized into: high transsphincteric fistulae in 58 (77.3%), supra-sphincteric fistulae in 7 (9.3%), extra-sphincteric fistulae in 2 (2.7%) and high transsphincteric fistula with horse shoe extension in 8 (10.7%). Our results recorded that; all patients in group (B) and group (C) were satisfied with the degree of continence, while in group (A), 3 patients had minor disturbances of continence. As regards the recurrence rate, the least recurrence was recorded in group B (8%) in comparison with group A and C (16 % and 24 % respectively, P value < 0.02).

**Conclusions**: Surgical procedures in treatment of high perianal fistulae such as seton placement, core fistulectomy with advancement flap and injection of fibrin glue, are different in characters and results. The most successful one is the advancement flap technique, but it is difficult and has prolonged postoperative hospital stay. Fibrin glue injection has the highest rate of recurrence but it is easy, least painful and not associated with division of the sphincter muscles. Seton technique carries the highest risk of incontinence rate, and the most painful one, but its results in curing fistulae are considered to be reasonable.

## Introduction:

Fistula-in-ano is an ancient and common surgical problem described in medical literature. A fistula-in-ano is a hollow tract lined with granulation tissue connecting a primary opening inside the anal canal to a secondary opening in the peri-anal skin. Secondary tracts may be multiple and from the same primary opening. The prevalence rate is 8.6 cases per 100.000 populations. The male to female ratio is 1.8: 1. Anal fistula is nearly always caused by previous anorectal abscesses. Anal canal glands situated at the dentate line afford a path for infecting organisms to reach the intramuscular spaces. Other fistulae develop secondary to trauma, Crohn's disease, anal fissure, carcinoma, , radiation therapy, actinomycoses, tuberculosis and chlamydial infections **(Dennis et al, 2003)**. Despite being a benign disease, it causes a lot of troubles to patients. Pain, discharge, bleeding, staining of the under-wears, inability to sit for long time and recurrent abscess formation are among many annoying symptoms of the disease. Not only the disease is a problem in its symptoms, but also its treatment is challenging. This is because of high recurrence rates after surgery **(Aguilar et al,.1996)**, and moreover, incontinence is an inevitable risk if part of the sphincter mechanism is sacrified in the course of surgery **(Miller and Finan, 1998)**.The real problem with fistula surgery is that the more the surgeon does to avoid recurrence, the more he might end up with a patient suffering from faecal incontinence. On the other hand, the more the surgeon does to avoid the occurrence of faecal incontinence, the more likely recurrence will occur. Most subcutaneous, intersphincteric, and low transsphincteric fistulae can be operated upon by fistulotomy without complications **(Singer and Cintrom,2004)**. On the other hand, **Perez et al., (2005)** stated that fistulotomy of high transsphincteric, suprasphincteric, or extrasphincteric fistulae can result in alteration of continence in up to 50% of patients. This incontinence leads to the development of alternatives to fistulotomy, including cutting or draining setons and endorectal advancement flaps. Even these options induce side effects of significant postoperative pain, wound complications, and incontinence **(Dworkasing et al., 2005)**. Since none of these alternatives has been able to dramatically improve upon the incontinence and morbidity of fistulotomy, additional procedures have been sought. One such procedure is injection of the fistulae with fibrin glue. This represents a novel treatment modality since it effectively treats fistula-in-ano, but does not cause painful wounds or involve the division of any sphincter fibers **(Jackson et al., 2001)**.**Aim of the work:** Evaluation of different surgical procedures in treatment of high perianal fistulae as regards success rate, recurrence rate and other complications. **Patients and methods:**This study was conducted on 75 patients with high anal fistulae who were admitted to Sohag University Hospital in the period from October 2003 to July 2005.All patients were subjected to

the following preoperative evaluation: full history taking (including history of associated gastrointestinal symptoms suggestive of Crohn's disease & ulcerative colitis, past history of previous anal fistula operation and history of any degree of incontinence)and anorectal examination (including inspection of the anal region to locate the external openings& their number and digital rectal examination to locate the internal opening ,any horseshoe extension, the relation of the tract to the anorectal ring and assessment of the sphincter tone).Routine preoperative investigations were also performed. Special investigations included: fistulogram (fig. 1)to the all patients and magnetic resonance imaging (MRI) (fig. 2)in recurrent cases to detect any side tracts, supralevator extension and assessment of the integrity of the anorectal ring. Biopsy was performed preoperatively in suspected cases of Crohn's disease,ulcerative colitis and malignancy and as a routine work postoperatively. **Patient classification and intraoperative assessment:** Patients were divided randomly into 3 groups, each group treated by certain surgical procedure as follows: Group A: included 25 patients treated by seton placement. Group B: included 25 patients treated by advancement flap. Group C: included 25 patients treated by curettage of the fistulous tract and injection of fibrin glue with drainage of the external opening. After categorization of our patients surgical consent was taking for each patient on admission. Mechanical and chemical bowel preparations were performed one day before surgery. At operation patient was put in lithotomy or prone jack knife position after giving him spinal anesthesia. Then, we started with inspection of the perianal skin for detection of the site and number of the external openings followed by palpation and digital examination which often revealed a suspicious scarred or retracted anal crypt. Intraoperative assessment of the fistulous tract as regard its direction, course, site of the internal opening and relation of the tract to the anorectal ring was the mainstay for the diagnosis of high perianal fistulae. Low fistulae were excluded from our study. After that, the external opening was probed with a straight flexible metal probe bent to a gentle curve. The probe was used gently to prevent the creation of a false passage. Anoscopy was used to give good visualization of the dentate line, rectal and anal mucosa and sometimes the site of internal opening. Anoscope sometimes revealed the presence of pus coming from the internal opening on massaging the tract. If the internal opening could not easily be identified by the previous procedures, saline, diluted hydrogen peroxide, methylene blue or mixture of them was injected into the external opening via a syringe or a large-bore angiocatheter. A small blue bubble usually appeared at the site of the internal opening. If the internal opening was not appeared or visualized, traction by pulling on the external opening may induce dimpling or protrusion of the involved crypt. We classified fistulae in our patients into intersphincteric, suprasphincteric and extrasphincteric according to **Park's et al** classification in 1976.**Surgical techniques:** After identification of the tract and

internal opening, one of the following surgical procedures was used: **Seton placement fig. (3, 4)**It was described by **Williams et al, (1991), Loberman et al, (1993) and Dennis et al, (2003).** In our study, Seton was done in group (A). The Seton was passed through the fistula tract around the anorectal ring after opening the skin, subcutaneous tissue and internal sphincter muscle. The seton used in this study was 2-silk seton. The seton was tightened down and secured with a separate silk tie. It was fixed by a series of knots to a shaved portion of the posteromedial part of the thigh via a multiple plaster straps. The seton was left loose for 2 weeks to enhance drainage of the intersphincteric space and promote fibrosis in the deep sphincter muscle. After that the seton was tightened on gradually in serial visits in outpatient clinics. With time: fibrosis occurred above the seton as it gradually cut through the sphincter muscles and essentially exteriorized the tract, until it was pulled completely. **Mucosal advancement flap repair** fig (5&6) this surgical technique was performed in group (B) of patients, as described by **Kodner et al (2000) and Ortiz and Marzo, (2000).** A circular incision around the external opening was made. The external opening was then grasped with tissue forceps. The tract was then dissected using cautary and heamostasis was secured all the time to give good visualization of the anatomical landmark of the anal muscles. The tract was dissected until it was cored out from the muscles and reaching the mucosa. The tract was then excised as well as any side tracts and the muscle defect was closed with absorbable stitches. A mucosal flap including part of internal sphincter and circular muscle of the rectum was then developed, with its base sited cranially. The internal opening was excised by resecting the lower portion of the mucosal flap. The site of the internal opening and the infected anal gland was curetted and the defect was closed by 4/0 polyglactin sutures. The flap was mobilized and sutured below the muscle repair using interrupted 4/0 polyglactin sutures. The external wound was left opened for drainage and packed loosely. After operation, intravenous fluid replacement therapy was maintained for 3 days followed by normal diet and use of bulk laxatives. The external wound was dressed daily. **Application of fibrin glue: this procedure was done in group (C). It was described by Cintron et al, (1999) and Jose et al, (2000). Preparation of fibrin glue:*** Fibrinogen preparation: 500 ml. of patients' blood was obtained and sent to laboratory. The plasma was separated and frozen after donation of blood. The frozen fresh plasma was slowly thawed to approximately 6° C. The insoluble proteins were then spun down and reconstituted with 10 to 15 mL of the patient's own plasma. The produced concentrate was frozen to be used within four hours before surgery where it was thawed in 37°C water bath for 10-15 minutes.*Thrombin preparation: Thrombin was obtained from Hoechest Company as freeze-dried vials and buffer solution. Each vial contains standardized quantities of bovine thrombin and bovine albumin and was prepared as test thrombin reagent used in laboratory

investigation for determination of thrombin time in human plasma. **Technique of fibrin glue application:** fig. (7&8)The fistulous tract was dissected with its side branches if present until reaching the ano rectal ring and no further dissection to avoid injury of the anorectal ring. The tract was excised until the level of the anorectal ring. The residual part of the tract was then thoroughly cleaned and curetted using blunt curette to remove epithelial lining, mucous membrane and granulation tissue. The fistula was then washed with about 50ml of saline solution containing 2 gram of cefotaxime. Suturing of the internal opening using chromic 3/0 suture or putting a gauze pack into the anal canal to prevent leakage of fibrin was done. The fibrinogen concentrate and thrombin were injected simultaneously and at the same time into the prepared residual part of the fistula tract using double way, wide pore angiocatheter. 1-2 mL fibrin glue was used in each patient. Application of gauze pack into the anal canal and perianal pad painted with antiseptic solution (povinated iodine) was done. **Postoperative care and follow up:** All patients were submitted to postoperative analgesia. The external wound was dressed daily. Regular outpatient visits were performed in the first month every week, in second and third month every 2 weeks, and after that every month. In each visit the patient was asked for pain, discharge, bleeding and anal abscess formation. Local examination was done in each visit to evaluate closure of the fistula, presence of any discharge, swelling, tenderness, abscess formation or other complications.

**Statistical methods:-**

Statistical analysis of the results was performed using SPSS software, P value $< 0.05$ was considered to be significant.

**Results:**

The present study involved 75 patients with high fistula-in-ano. Their ages ranged from 10 to 74 years with a mean age 37.45 years. There were 65 males (86.67%) and 10 females (13.33 %). Purulent discharge was the most common symptom (69%). Preoperative imaging techniques that used in this study were fistulography and MRI. Fistulography was done to all patients and it was correctly identified the internal opening of fistulae in only 27% of cases, whereas side tracts were detected in 60% and the anatomical type of fistulae was identified in 53 %. MRI was performed in 9 cases with recurrent fistulae more than one operation. It was succeeded in detection of the internal opening and the anatomical landmark of fistulae in 8 cases (88.9 %), while it was successful in detection of side tracts in all the 9 cases (100 %). The diagnosis of our series was dependent mainly on the intraoperative assessment of the fistulous tract that was done to all patients and considered the mainstay diagnostics measure. We found that its accuracy rate in detection of the anatomical type of fistulae was 96%, internal opening detection in 94% and side tracts in 92%.Our patients were categorized into: high transsphincteric fistula in 58 patients (77.3%), supra-sphincteric fistula in 7 (9.3%), extra-sphincteric fistula in 2 (2.7%) and high transsphincteric fistula with horse shoe extension in 8 (10.7%). There was no statistically

significant difference among all groups with respect to the type of fistula (P > 0.05).Regarding the postoperative outcome results of all groups, it was found that group (C) which treated by autologous fibrin glue injection had the highest rate of recurrence (24%). The next procedure in the recurrence rate was group (A) which treated by cutting seton (16%). The best result reported in this study was in group (B) which treated by advancement flap, it had the least recurrence rate (8%). All patients in group (B) and group (C) were satisfied with the degree of continence, while in group (A), 3 patients had minor disturbances of continence in the form of occasional escape of flatus, when the intra -abdominal pressure was raised. Other complications included: bleeding in 6 cases, prolapse of the rectal mucosa in 4 and abscess formation in 8. Abscess formation was followed by recurrence in 7 cases (diagram).

**Table. (1): Types of anal fistulae in the different studied groups**

| | High trans-sphincteric | | Supra-sphincteric | | Extra-sphincteric | | high transsphincteric with horse shoe extension | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | NO. | % | NO. | % | NO. | % |
| Group A | 22 | 88% | 2 | 8% | 0 | 0% | 1 | 4% |
| Group B | 19 | 76% | 2 | 8% | 0 | 0% | 4 | 16% |
| Group C | 17 | 68% | 3 | 12% | 2 | 8% | 3 | 12% |
| P.value | 0.731 (Ns) (Non-significant) | | | | | | | |

**Table. (2): Shows the mean value (SD±) of the preoperative data of our patients in each group**

| | Mean duration of fistula (months) | No. of fistula | | Previous operations % |
|---|---|---|---|---|
| | | Solitary% | Multiple% | |
| Group A | 24.6 ± 8.01 | 88% | 12% | 28% |
| Group B | 24.2 ± 7.92 | 84% | 16% | 36% |
| Group C | 25.2 ± 8.53 | 88% | 12% | 28% |
| P-value | 0.531 | 0.635 | | 0.721 |
| Significance | Non-significant | Non-significant | | Non-significant |

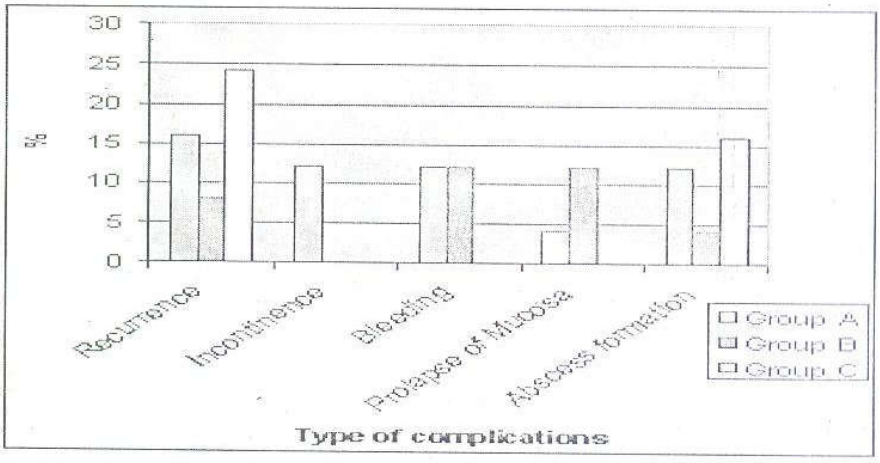



Diagram shows. Percentages of post operative complications in the three different patient's groups

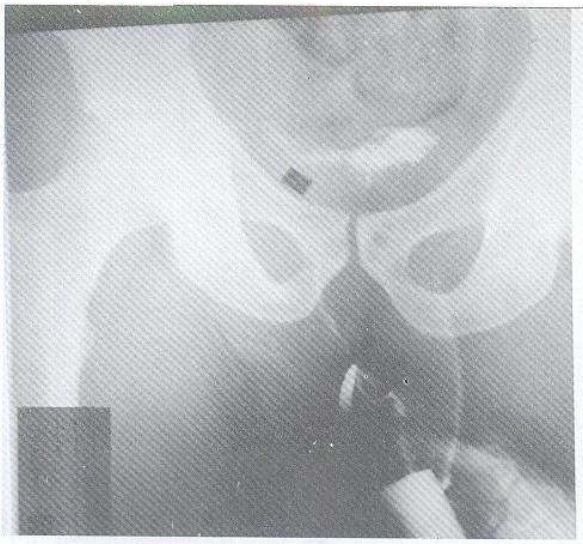
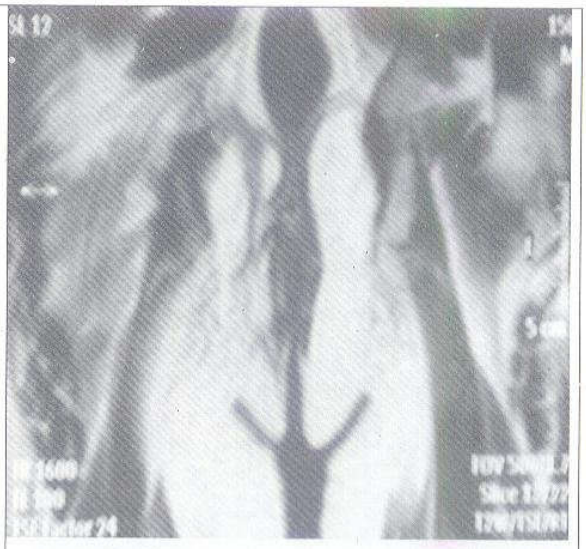


**Fig. (1).** Fistulogram showing a significant fistula connecting the lower rectum along long fistulous tract.



**(2).** Coronal T2WI revealed right sided iorectal fibrotic tract, crossing the right levator ani (straight arrow) at high level.

## Seton placement

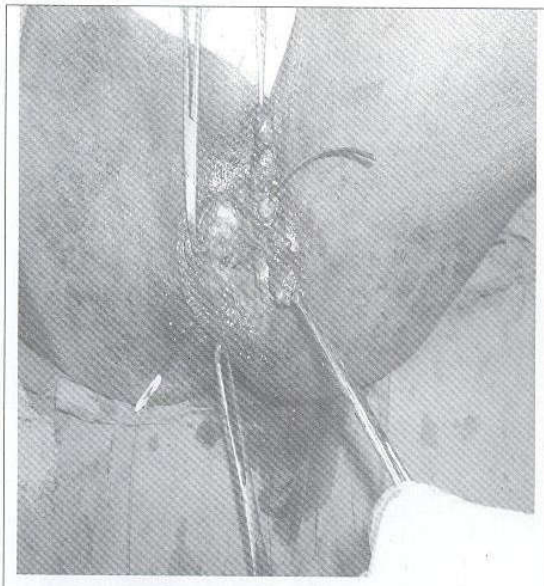


**Fig. (3).** Passage of the fenestrated probe included with 2-silk seton from the external opening to the internal opening.

**Fig. (4).** Fixation of the seton to the shaved posteromedial portion of the thigh with gradual tightening of the seton on subsequent office visits.

**Advancement mucosal flap**

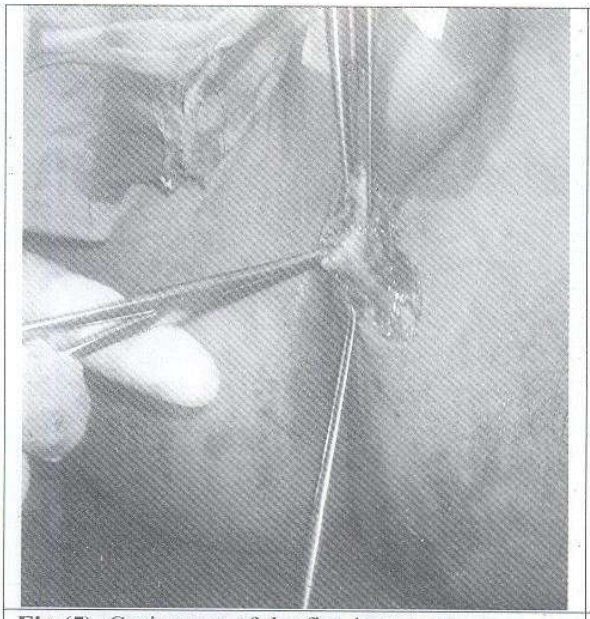


**Fig (5).** Coring out of the fistulous tract

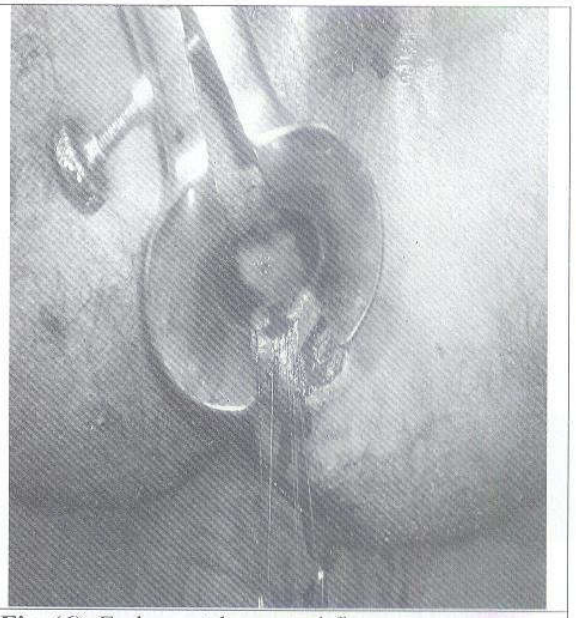


**Fig. (6).** Endo-rectal mucosal flap.

**Injection of fibrin glue**

**Fig.(7).** Curettage of the fistulous tract with blunt curette

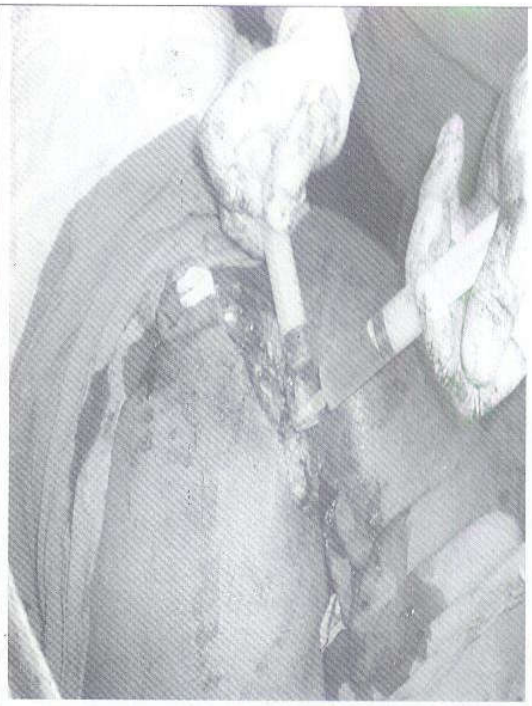


**Fig.(8).** Injection of fibrinogen concentrate and thrombin simultaneously by double way wide bore angiocatheter after suturing of the internal opening.