

COMPARATIVE STUDY BETWEEN STAGED RE-ROUTING AND RECTAL ADVANCEMENT FLAP WITH CURETTAGE OF FISTULA TRACT IN TREATMENT OF HORSE SHOE PERIANAL FISTULA

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ABSTRACT

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Background: Complex anal fistula has been a hot topic in clinic. Many surgical techniques have been described for the treatment of such anal fistula, including the use of seton, fibrin glue, collagen plugs, rectal advancement flaps, fistulotomy with sphincter repair, and rerouting the fistula tract. However, the results have been variable, and no one procedure is superior to the others absolutely. It is worth our concern that the goal of any treatment procedure is to obliterate the tract and to have low recurrence rates while maintaining full continence.

Comparison was made between the two procedures (re-routing and rectal advancement flap) to stand on the superiority of each one over the other. We compared data including: Healing time, post operative bleeding and infection, recurrence rates and continence.

Patients and Methods: The study was conducted over 40 patients with high trans-sphincteric fistulas, randomly divided into 2 equal groups, who underwent Rerouting of the tract in one group and rectal advancement flap in the other group.

Results: Rerouting technique and rectal advancement flap have nearly similar incidence of post operative complications and continence but rectal advancement flap is associated with short healing period and a high recurrence rate as compared to re-routing technique.

Conclusion: In patients with high trans-sphincteric anal fistulas, rectal advancement flap has a short healing period but a high recurrence rate which was statistically insignificant.

Keywords: Re-routing, rectal advancement flap, high perianal fistula

INTRODUCTION:

Fistula-in-ano is a common medical problem affecting thousands of patients annually. ⁽¹⁾

Most fistulas are thought to arise as a result of cryptoglandular infection with resultant perirectal abscess. The abscess represents the acute inflammatory event, whereas the fistula represents the chronic process. Symptoms generally affect quality

of life significantly, and they range from minor discomfort and drainage with resultant hygienic problems up to major septic complications. ⁽²⁾

The true prevalence of anal fistulas is unknown, as anorectal discomfort is often attributed to symptomatic hemorrhoids. The incidence of an anal fistula developing from an anal abscess ranges from 26 to 38 percent. The mean age for presentation of anal abscess and fistula disease is 40 years (range 20 to 60).

Adult males are twice as likely to develop an abscess and/or fistula compared with women⁽³⁾.

Different classifications have been put forward which categorize these fistula into low or high, simple or complex, or according to their anatomy inter-sphincteric, trans-sphincteric, supra-sphincteric or extra-sphincteric⁽⁴⁾.

The ideal treatment for an anal fistula should be associated with low recurrence rates, minimal incontinence and good quality of life. Because of the risk of a change in continence with conventional techniques, sphincter-preserving techniques for the management of complex anal fistulae have been evaluated. ⁽⁵⁾

To achieve the objective in high anal fistula, different surgical techniques have been described in literature from time to time. These include Park's fistulotomy, insertion of a seton, two-stage fistulotomy, primary fistulectomy with occlusion of the internal ostium, fistulotomy with primary repair of the sphincter, endorectal advancement flaps, anocutaneous advancement flap, repair of fistula using fibrin adhesive glue and re-routing the fistula. The number of procedures mentioned indicates that there is no single established way of treating these high fistulas⁽⁶⁾.

Conventional laying-open technique in high perianal fistula may involve sacrifice of part or whole of the sphincter muscle impairing continence. It is quite obvious that the more the extent of anal muscle division, the greater the degree of anal incontinence⁽⁷⁾.

A transposition technique for the management of high anal and anorectal fistulae was described by Mann and Clifton in 1985. The method involved re-routing the extra-sphincteric portion of the track into an intersphincteric position with immediate repair of the external sphincter. The newly positioned intersphincteric fistula is then dealt with at a

later date when the external sphincter was soundly healed.⁽⁸⁾

The rectal advancement flap was first described by Noble in 1902 for rectovaginal fistula. Elting and Laird modified and applied it in the treatment of anal fistulas in 1912 and 1948, respectively. In 1985, Aguilar showed by using this rectal advancement flap in the treatment of anal fistula only a recurrence of 1.5% and a fecal incontinence of 10%. Nowadays, it is a recognized procedure in sphincter-preserving surgery, although the technique presents many variations depending on authors⁽⁹⁾.

AIM OF THE WORK

The aim of this study was to prospectively evaluate the success rate, the recurrence and incontinence when using the re-routing technique in comparison to rectal advancement flap for treating high trans-sphincteric perianal fistula.

PATIENTS AND METHODS

This study was a randomized prospective study which was conducted at Ain Shams University hospitals recruiting (40) patients who were operated upon between February 2018 and February 2019 with minimal follow up to 12 months postoperatively.

An informed consent was taken from all patients who accepted to participate in the study. Risks, complications and alternative procedures were explained to the patient. Confidentiality was assured of the personal data and medical information of all patients.

Inclusion criteria: Fistula in ano, High Trans-sphincteric Type (Primary or recurrent)

Exclusion criteria: Patients with low perianal fistula, inflammatory bowel disease, acute perianal abscess and major incontinence.

All patients in this study were under the care of one surgical team under supervision of consultant surgeon.

Methods: All patients were subjected to the following: **Preoperative:**

Clinical history: **Personal history:** including age, occupation, and special habits of medical importance particularly smoking. **History of present illness:** mode of onset, duration of illness, any previous treatment for intestinal disease like tuberculosis, ulcerative colitis and Crohn's disease and history of previous surgeries in the perianal area. **Past history of medical diseases:** such as diabetes, drug allergy, previous blood transfusion, and previous operations.

Clinical examination: Clinical examination of the perineum and ano-rectum, and proctoscopy to detect the type of fistula.

The degree of continence is evaluated by The Wexner scoring system.

Investigations: **Routine preoperative investigations** are requested for all patients, including complete blood picture, coagulation profile, liver and kidney function tests, fasting blood sugar, chest x-ray. Special investigations are requested for patients with specific complaints as pulmonary function tests for patients with manifestations of chronic obstructive airway disease; ECG for patients above the age of 40. **MRI (Magnetic resonance imaging)** for anorectal region.

The first group (A) included 20 patients who underwent the rerouting technique.

The second group (B) included 20 patients who underwent rectal advancement flap .

Operative technique:

Position: Lithotomy. Anesthesia: General or Spinal anesthesia. 500 mg of metronidazole with 1.5 gm of cefuroxime given intravenously at the beginning of surgery. Antisepsis of the operative site. Inspection is followed by a digital rectal examination and proctoscopy. The site of the external opening is probed to define the internal opening. Identification is aided, if necessary by a dilute hydrogen peroxide injection through the external opening. Assessing the extent and position of the fistula by palpation and the gentle use of a probe which is kept as a guide for dissection.

Operative technique for group (A):

The skin around the external opening is elliptically incised and the track is dissected as high as possible. The fistulous track is "cored-out" up to and through the external sphincter or puborectalis muscle which are clearly exposed during the operation. Then the inter-sphincteric plane is opened and dissected up to the opening of the fistulous track. The external part of the track is now passed through the hole in the external sphincter and is brought down into the inter-sphincteric plane then a seton is passed through the track and the track is fixed to the skin. At second stage (after 8 to 12 weeks) when the external wound is healed, the fistulous track marked by silk, is laid open by dividing the remaining tissues.



Figure (1): Case of high transphincteric fistula with external opening at 2 o'clock and internal opening at 6 o'clock



Figure (2): The skin around the external opening is elliptically incised and the track is dissected as high as possible.



Figure (3): The fistulous track(white arrow) is "cored-out" up to and through the external sphincter(black arrow) which are clearly exposed during the operation.



Figure (4): The external part of the track is now passed through the hole in the sphincter and is brought down into the inter-sphincteric plane.



Figure (5): Probe is passed through fistula tract to the internal opening.

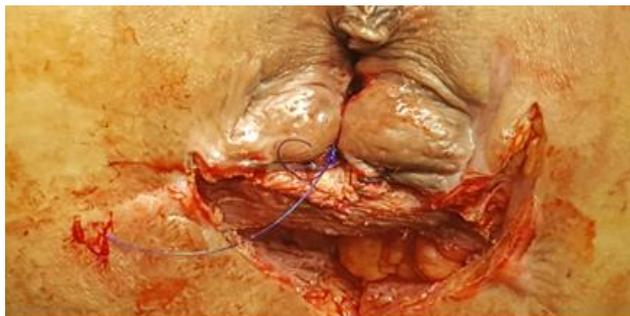


Figure (6): Seton is passed through fistula tract to the internal opening.

Operative technique for group (B):

Fistulectomy of extrasphincteric part of fistula tract up to external sphincter and curettage of trans sphincteric fistula track, Identification of internal opening and

mobilization of a vascularized, tension free mucosal flap, and coverage of the internal opening, which is usually closed with absorbable suture.



Figure (7): A case of High trans sphincteric fistula with external opening at 2 o'clock and internal opening at 6 o'clock .



Figure (8): Coring out of the extrasphincteric part of the tract



Figure (9): curettage of trans sphincteric fistula tract by gauze

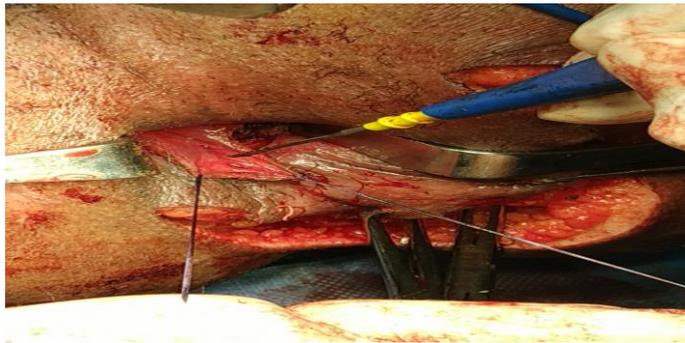


Figure (10): mobilization of a vascularized, tension free mucosal flap

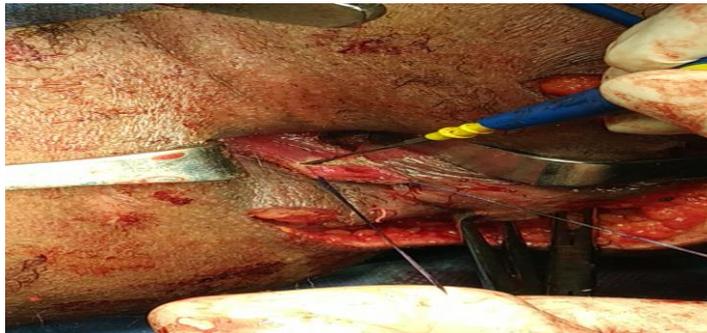


Figure (11): excision of portion of mucosa containing the internal opening.



Figure (12): closure of rectal advancement flap by absorbable sutures.

Postoperative assessment: Patients were assessed as regards: operative time, Infection, bleeding, recurrence and degree of continence by Wexner scoring system. Outcomes were evaluated at hospital, 2 weeks, 3 months, 6 months, and 1 year.

Statistical Analysis:

Data were collected, revised, coded and entered to the Statistical Package for Social Science (SPSS) version 21 and the following were done:

Qualitative data were presented as numbers and percentages while quantitative

data were presented as mean, standard deviations and ranges.

The comparison between two groups with qualitative data were done by using Chi-square test and Fisher exact test was used instead of Chi-square test when the expected count in any cell was found less than 5.

The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered \pm significant as the following: P > 0.05: Non significant. P < 0.05: Significant. P < 0.01: Highly significant.

RESULTS:

Table (1): age and sex distribution in the two groups:

		Re-routing group	Rectal advancement flap group	Test value	P-value	Sig.
		No = 20	No = 20			
Age	Mean \pm SD	36.40 \pm 8.19	37.30 \pm 10.05	0.310•	0.758	NS
	Range	20 – 50	25 – 60			
Sex	Female	4 (20.0%)	5 (25.0%)	0.143*	0.705	NS
	Male	16 (80.0%)	15 (75.0%)			

*:Chi-square test; •: Independent t-test

Table (2): Comparison between rerouting group and rectal advancement group regarding incidence and types of complications.

Complications	Re-routing group		Rectal advancement flap group		Test value*	P-value	Sig.
	No	%	No	%			
No	18	90.0%	17	85.0%	0.229	0.633	NS
Yes	2	10.0%	3	15.0%			
Post-op bleeding	1	5.0%	1	5.0%	0.000	1.000	NS
Incontinence	0	0.0%	0	0.0%	NA	NA	NA
Perianal abscess	0	0.0%	0	0.0%	NA	NA	NA
Stitsh sinus	0	0.0%	0	0.0%	NA	NA	NA
Infection	1	5.0%	2	10.0%	0.360	0.548	NS

The previous table shows that there was no statistically significant difference between the two studied groups regarding incidence and types of complications

Table (3) : comparison between the two groups as regard Wexner score and the healing period.

z		Re-routing group	Rectal advancement flap group	Test value	P-value	Sig.
		No = 20	No = 20			
Werner score after all operations	0	20 (100.0%)	19 (95.0%)	1.026*	0.311	NS
	1	0 (0.0%)	1 (5.0%)			
Healing period (day)	Mean±SD	43.40 ± 5.73	27.20 ± 2.55	11.547•	0.000	HS
	Range	35 – 53	22 – 30			

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value < 0.01: highly significant (HS) *:Chi-square test; •: Independent t-test

The test show no statistical difference in Wexner score after operation between the two groups but there was a highly significant difference in healing period.

Table (4) : comparison between the two groups regarding recurrence rate

Recurrence	Re-routing group		Rectal advancement flap group		Test value*	P-value	Sig.
	No	%	No	%			
No	18	90.0%	15	75.0%	1.558	0.212	S
Yes	2	10.0%	5	25.0%			

The test show no statistically significant difference in recurrence rate between the two studied groups

Table (5): relation between rate of complications and recurrence rate in the studied patients

Complications	No Recurrence		Recurrence		Test value*	P-value	Sig.
	No	%	No	%			
No	31	93.9%	4	57.1%	7.149	0.008	HS
Yes	2	6.1%	3	42.9%			
Post-op bleeding	2	6.1%	0	0.0%	0.447	0.504	NS
Incontinence	0	0.0%	0	0.0%	NA	NA	NA
Perianal abscess	0	0.0%	0	0.0%	NA	NA	NA
Stitsh sinus	0	0.0%	0	0.0%	NA	NA	NA
Infection	0	0.0%	3	42.9%	15.290	0.000	HS

The test show highly significant relation between post operative complication(infection) and recurrence rate .

Table (6): relation between post operative Wexner score and recurrence

Werner score after all operations	No Recurrence		Recurrence		Test value*	P-value	Sig.
	No	%	No	%			
0	33	100.0%	6	85.7%	4.835	0.028	S
1	0	0.0%	1	14.3%			

The test show statistically significant relation between recurrence and post operative incontinence

DISCUSSION

The management of high and complex fistulas needs to balance the outcomes of cure and continence. There is a risk of

sphincter muscle damage during fistulotomy, and this might lead to an unacceptable risk of anal incontinence of varying degrees. The degree of incontinence depends on the amount of damaged muscle, preexisting sphincter damage, and scarring of the anal canal. The rectal advancement flap achieves healing of the fistula in a significant number of patients, while

avoiding any sphincter division and therefore the development of further incontinence⁽¹⁰⁾

In this thesis, we evaluated the two sphincter preserving procedures for anal fistulas. The present prospective randomized trial was conducted to assess the value of rerouting of the tract technique in the treatment of high trans-sphincteric anal fistulas compared with rectal advancement flap.

The mean age of patients in the re-routing (group A) group was 36.4 years and in the rectal advancement flap group (group B) was 37.3 years. 16 patients (80 %) of patients in group A and 15 patients (75 %) of group B were males. In comparison with a study performed by Chung et al. in 2009 and included 232 patients who had high trans-sphincteric fistulas of cryptoglandular origin, the median age was 47 (range 21–82) of them, 86 patients were treated with seton placement and 96 with an advancement flap. Seventy patients (81.4%) of the seton group and 71 patients (73.9%) of the advancement flap group were males which was nearly similar to our study⁽¹¹⁾.

Out of 20 patients in the rerouting group only one case suffered from postoperative complications in the form of infection of the external wound (5%), in comparison to 2 cases out of 20 suffering from postoperative infection of the wound in the rectal advancement group (10%).

In our study postoperative bleeding occurred in only one patient of group A (5%) and one patient (5%) in group B. In all cases intraoperative bleeding could be controlled with regular hemostatic measures using diathermy, compression or packing. Also, submucosal injection of drenaline (1/10000) was found to be a good tool to reduce intraoperative bleeding. In a study by Mushaya et al. (2012) that included 39 patients, 14 patients treated by rectal advancement flap, postoperative bleeding

was encountered in 2 (14%) patients of the rectal advancement flap group⁽¹²⁾.

Chung et al. in 2009 reported that the healing rate at week 12 was 60% for flap advancement and 32% for seton. Healing rates were significantly different between treatment groups. In our Study, there was statistically significant difference between both groups in favour of group B as regards time to complete healing with the mean period to complete healing of 43.40 days in group A and 27.20 days in group B. Ghahramani et al. study included 40 patients that were treated by the endorectal flap technique, reported that complete healing was achieved in 28 (70%) patients as confirmed by examination four weeks after surgery which was nearly similar to our study.

Comparing both groups, we found no significant difference in the postoperative quality of life or change in Wexner scoring after 1 year. Mushaya et al. in a study included 39 patients, 14 patients treated by rectal advancement flap, one patient (7%) in the rectal advancement flap group had minor incontinence that resolved within a few weeks.

Comparing to the literature regarding the rectal advancement technique, Balciscueta et al describes a meta-analysis to evaluate incontinence after performing rectal advancement flaps depending upon flap thickness (full-thickness, partial-thickness, or mucosal flaps) and treatment of the fistulous tract (core-out or curettage). The pooled rate of fecal incontinence (11 studies, 622 patients) was 13.3% and ranged from 0 to 51%. The pooled rate of anal incontinence in mucosal flaps was 10.3%, in partial-thickness flaps 14.1% and in full-thickness flaps 20.4%. The pooled rate of fecal incontinence in core-out of fistula tract was 14.3%. The pooled incontinence rate in curettage was 12%⁽¹³⁾.

After 1 year of follow-up, the recurrence rate in patients was 25% (5 patients) in rectal advancement group compared with 10% (2 patients) in the rerouting group which was not statistically significant. Three patients (42.9%) developed recurrence also had infection of the external wound which showed significant relation between infection and recurrence rate. Comparing to the literature regarding the rerouting technique, it was found that the procedure described by Mann and Clifton in 1985, performing the rerouting technique on 5 patients with healing rate 100% and no recurrences with follow up reaching up to 3 years⁽⁸⁾.

Comparing to the literature regarding the rectal advancement technique, Balciscueta et al described a meta-analysis to evaluate recurrence after performing rectal advancement flaps depending upon flap thickness (full-thickness, partial-thickness, or mucosal flaps) and treatment of the fistulous tract (core-out or curettage). The pooled recurrence rate in mucosal flaps was 26.7%, in partial-thickness flaps 22.9%, and in full-thickness flaps 7.4%. We need more research work to study the effect of flap thickness on recurrence rate and incontinence⁽¹³⁾.

Further research work is still warranted to confirm the long term outcome of these 2 techniques with a larger sample size and a longer follow up period. In addition, the determination of predictors of failure of both techniques would be useful in defining their roles in the surgical management of all anal fistulas.

Conclusion:

Rerouting technique and rectal advancement flap have nearly similar incidence of postoperative complications and incontinence but rectal advancement flap is associated with a short healing period and a high recurrence rate as compared to re-routing technique.

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مقارنة بين العلاج الجراحي للناصور حدوة الحصان عن طريق إعادة التوجيه ورفرف تقدم المستقيم مع كحت الناصور

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المستخلص

يعد الناصور الشرجي المعقد موضوعاً هاماً في العيادة الجراحية. وقد تم وصف العديد من التقنيات الجراحية لعلاج مثل هذا الناصور الشرجي، بما في ذلك استخدام غرزة سيتون، غراء الفيبرين، سدادات الكولاجين، عمل رقعة عن طريق المستقيم، بضع الناصور مع إصلاح العضلة العاصرة للشرج، وإعادة توجيه مسار الناصور. ومع ذلك، فإن النتائج كانت متغيرة، وليس هناك إجراء واحد متفوق على غيرها تماماً.

إن الهدف من أي إجراء علاجي هو إصلاح الناصور والحصول على معدلات ارتجاع منخفضة مع الحفاظ على السلامة الكاملة لعضلة الشرج. إن استئصال الناصور يترك جروحاً أصغر و يعجل التئام الجروح. حتى الآن، لا يزال فتح مسار الناصور هو الأكثر استخداماً على نطاق واسع. ولكن، فإن معدل الشفاء المرتفع محدود بسبب حقيقة أن فتح المسالك المصابة بالناصور الشرجي العالي وتقليص العضلة العاصرة الداخلية والخارجية ينطوي على خطر حدوث سلس برازي يصل إلى 40%.

في عام 1985، يصف مان وكليفتون إعادة توجيه مسار الناصور لعلاج الناصور المركب مع الحفاظ على سلامة عضلة الشرج وتقليل الارتجاع مع نتائج أولية واعدة.

تم وصف الورقة الأولى المتعلقة باستخدام سدلة متقدمة من المستقيم عام 1902 في علاج الناصور بين المستقيم والمهبل. ثم تم إجراء دراسة لمقارنة أنواع الرقعة المستخدمة من جدار المستقيم في علاج الناصور وأوضحت النتائج أن معدل الارتجاع كان 22.7% في الرقعة ذات السمك الجزئي و 7.4% في الرقعة ذات السمك الكلي. وكان معدل حدوث سلس البراز 13.3%.

في هذه الدراسة، تم إجراء مقارنة موضوعية بين الإجراءين مع التركيز على جوانب متعددة من كل من الإجراءين للوقوف على تفوق كل واحد على الآخر. تمت مقارنة البيانات بما في ذلك: وقت الشفاء، والنزيف بعد العملية الجراحية والتهاب الجرح، ومعدلات ارتجاع الناصور والتحكم في الإخراج.

وقد أجريت الدراسة على أكثر من 40 مريضاً يعانون من ناصور الشرج العالي، وتم تقسيمهم عشوائياً إلى مجموعتين متساويتين، الذين خضعوا لإعادة توجيه مسار الناصور واستخدام سدلة متقدمة من قناة الشرج.

كان كلا الإجراءين متشابهين تقريباً في معدلات التحكم في الإخراج، ومعدل حدوث المضاعفات بعد العملية ولكن معدل ارتجاع الناصور أقل في إعادة توجيه مسار الناصور مقارنة باستخدام سدلة متقدمة من قناة الشرج.