

Rhomboid Island Flap Anoplasty in Post- Haemorrhoidectomy Anal Stenosis

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Abstract

Background: Anal stenosis may occur after anal surgery especially after surgical haemorrhoidectomy. Many types of flaps have been described for anal stenosis. We aimed to evaluate the outcome of dermal rhomboid island flap in treatment of post haemorrhoidectomy anal stenosis. **Patients and methods:** The current study included twenty patients with a clinical diagnosis of post hemorrhoidectomy anal stenosis underwent rhomboid island flap anoplasty. We assessed the caliber of the anal canal (measured with a conical calibrator), clinical improvement and postoperative complications for all patients. **Results:** There was high significant improvement in anal calibration with a mean difference obtained on comparing preoperative and 1 month' anal caliber, of 15.95 ± 1.88 ($p < 0.001$). Also, there was high significant improvement in CCIS with a mean difference obtained on comparing preoperative and 12 months' CCIS, of 7.55 ± 1.28 ($p < 0.001$). The majority of patients had no postoperative complications (85%). **Conclusion:** The use of Rhomboid Island Flap Anoplasty is a safe and suitable option for the treatment of mild, moderate and severe Post- Hemorrhoidectomy Anal Stenosis.

Key words: Anal Stenosis, Anoplasty, Rhomboid Island Flap, Haemorrhoidectomy

1. Introduction

Anal stenosis is defined as replacement of pliable anoderm by fibrotic connective tissue which make anal canal rigid, the stenotic segment may be localized to proximal or distal anal canal, but often the irregularities are noted to be diffuse and circumferential involving the entire anal canal [1].

Benign stenosis of the anal canal affects 1.5–3.8% of patients after surgical hemorrhoidectomy, and it has been reported that hemorrhoidectomy accounts for about 90% of anal stenosis cases [2].

Surgical treatment of anal stenosis depends on severity where mild degree stenosis may treated by partial lateral internal sphincterotomy. The resulting wound is then left open and allowed to heal by secondary intention. For prevention of recurrence, stool softener and fibers may used after surgery for long time [3].

A proper anoplasty should be carried out to repair anal canal tissue loss in cases of severe stenosis. Many flaps are used in anal stenosis which depend on replacement of scarred tissue by pliable anoderm, these flaps include lateral mucosal advancement flap, Y-V advancement flap, V-Y advancement flap, Diamond-shaped flap, House flap, U flap, C flap, Rotational S-flap and Internal pudendal flap. This study will discuss the dermal rhomboid flap [4].

Surgical treatment of anal stenosis may lead to various complications. These include flap necrosis due to absence of vascular supply, infection or local sepsis, dehiscence due to suture line tension, failure of stenosis repair, donor site problems, sloughing, ischemic contracture of the edge of the flap, pruritus, urinary tract infection subsequent to *Clostridium difficile* enterocolitis, fecal incontinence, constipation without stenosis,

urinary retention, restenosis and ectropion if the flap is advanced too far and sutured at the anal verge [5,6]. We aimed to evaluate the outcome of dermal rhomboid island flap in treatment of post haemorrhoidectomy anal stenosis.

2. Patients and methods

A prospective cohort study conducted at Department of General Surgery, Benha University Hospitals during the period from 1 January 2021 to 1 May 2022. An approval for the work from Ethics Committee in Faculty of Medicine, Benha University was obtained. The current study included twenty patients with a clinical diagnosis of post hemorrhoidectomy anal stenosis. Patients with other causes of anal stenosis as chron's disease or malignancy were excluded.

Detailed medical history had been taken to evaluate the duration of symptoms, any associated ano-rectal diseases, history of previous operation; and trial of conservative measures were done. Preoperative routine laboratory and radiological examinations were done included CBC, liver functions, kidney functions, INR, chest X-ray, and ECG.

Five days before the date of surgery, patients were advised to take stool softeners and to be on a fluid diet with no fiber-containing food. They were admitted to hospital 1 day prior to surgery. All patients received intravenous antibiotic (metronidazole 500 mg) 30 min before surgery, which was continued for 5 days postoperatively as 400 mg tablets three times daily. After surgery, patient started oral feeding at night of surgery or on the next day.

Surgical technique:

The flap remains on its subcutaneous pedicle and is then advanced into the excised area previously affected by the stenosis.

Step 1: The anal canal and extent of the stenosis are fully exposed. The dimensions of the stenosis are measured, and a rhomboid-shaped flap is marked on the perianal skin immediately lateral to the anal mucosa. The rhomboid sides vary in length between 1 and 2 cm. The medial tip of the rhomboid shape is then joined to the stenotic lesion using a single radial pen marking extending into the anal canal **Fig. (1)**.

Step 2: The stenosis and radial anal canal pen marking is incised using a No 15 blade. The incision is extended down through the subcutaneous tissue but not through the mucosal layer. It is usual for the stenotic ring to widen at that point creating room for the flap. The RSF is then created. The same blade is used to cut

precisely around the rhomboid edges. The flap is not freed from the subcutaneous tissue medially but only laterally, which allows medial transposition of the flap based on the medial pedicle. The flap is then advanced medially on its subcutaneous pedicle. Some further delicate undermining of the lateral flap subcutaneously maybe necessary to ensure it is mobile enough to be secured in the anal canal without tension. Once in place, a single-layer closure of 4-0 vicryl interrupted mattress sutures to the skin is used. The skin sutures should be spaced adequately to avoid excessive tension and subsequent ischaemia **Fig. (2)**.

Step 3: The lone star retractor is removed to take tension off the anal canal, and the lateral wound (where the flap was mobilized from) is partially closed **Fig. (3)**.



Fig. (1) Anal stenotic lesion and flap marked



Fig. (2) Anoplasty flap created on patients' right side and moved medially into anal stenosis



Fig. (3) Closure of anoplasty wound and lateral donor site left partially open

3. Results

The current study involved twenty patients; their age ranged from 46 to 61 years with mean age was 54.10 ± 4.46 years. There were 9 (45.0%) males and 11 (55.0%) females. Obstructed defecation syndrome (ODS) was found in 55% of patients, anal pain in 50%, bleeding after defecation in 55%, itching in 20%, soiling in 10%, liquid incontinence in 10% and abdominal pain was found in 5% of patient (Table 1).

Regarding operative data, operative time ranged from 30 to 40 minutes with mean time was 33.75 ± 4.55 minutes, mean of hospital stay was 1.85 ± 0.37 days and ranged from 1 to 2 days. The overall success rate was 95%. Also, there

were no intraoperative complications found in our study (Table 2).

Post-operatively, there was high significant improvement in anal calibration with a mean difference obtained on comparing preoperative and one month postoperative anal caliber, of 15.95 ± 1.88 ($p < 0.001$). Also, there was high significant improvement in CCIS with a mean difference obtained on comparing preoperative and 12 month postoperative CCIS, of 7.55 ± 1.28 ($p < 0.001$) (Table 3).

The majority of patients had no postoperative complications (85%). However, there was one (5%) patient had wound infection, one (5%) patient suffered from flap necrosis and one (5%) patient suffered from restenosis (Table 4).

Table (1) Demographic and clinical data of studied patients

	Studied patients (n = 20)	
	No.	%
Age at operative intervention (years):		
Range	46.0 – 61.0	
Mean \pm SD	54.10 \pm 4.46	
Median (IQR)	53.5 (50.5- 61.0)	
Gender:		
Male	9	45.0%
Female	11	55.0%
Symptomes:		
ODS	11	55.0%
Anal pain	10	50.0%
Bleeding after defecation	11	55.0%
Itching	4	20.0%
Soiling	2	10.0%
Incontinence (liquid)	2	10.0%
Abdominal pain	1	5.0%

Table (2) Distribution of patients regarding operative data

Operative data	Studied patients (n = 20)	
	No.	%
Operation time (min.)		
Range	30.0 – 40.0	
Mean± SD	33.75±4.55	
Median	30.0	
Hospital stay (days)		
Range	1.0 – 2.0	
Mean± SD	1.85±0.37	
Median (IQR)	2.0	
Success rate		
No	1	5.0%
Yes	19	95.0%
Intraoperative complications		
No	20	100.0%
Yes	0	0.0%

Table (3) Comparison between pre-operative and post-operative anal calibration

		Preoperative	Postoperative (1 month)	Paired T Test		
				Mean difference	T	P-value
Anal calibration	Range	5.5 – 10.5	21.0 – 26.5			
	Mean± SD	7.73± 1.26	23.68± 1.696	15.95± 1.88	37.99	<0.001*
	Median	7.75	23.75			
CCIS	Range	11.0 - 15.0	4.0 - 7.0			
	Mean± SD	13.25± 1.37	5.70± 0.98	7.55± 1.28	3.97	<0.001*
	Median	13.50	6.0			

CCIS: Cleveland Clinic Incontinence Score *p value was considered significant

Table (4) Distribution of patients regarding post-operative complications

Post-operative complications	Studied patients (n = 20)	
	No.	%
No	17	85.0%
Wound infection	1	5.0%
Flap necrosis	1	5.0%
Restenosis	1	5.0%

4. Discussion

The management for anal stenosis is based on the aetiology and severity of the condition. As a result, many treatments ranging from non-operative therapy to advanced surgical procedures may be undertaken. Mild stenosis can be managed with stool softener or fibers supplements. A cautious digital or mechanical dilatation or a partial lateral internal sphincterotomy can also be done in some situations of persistent symptoms, requiring caution to avoid possibly irreparable injury to the internal anal sphincter [7].

Very limited studies were found in literature investigating the rhomboid island

flap in treatment of post haemorrhoidectomy anal stenosis. So, our rationale was to detect the effect of dermal rhomboid island flap in treatment of post haemorrhoidectomy anal stenosis.

We found that there was high significant improvement in anal calibration with a mean difference of anal caliber from preoperative to one month postoperative of 15.95± 1.88.

This comes in agreement with the study by Gallo et al. [8] who revealed that the Preoperative anal caliber mean (range) was 9.96 ± 2.68 (5–15), and postoperatively at one month was 24.5 ± 1.47 (21–28), at 6 months was 24.14 ± 1.6 (21–28) and at 12 months become 24.06 ± 1.46 (21–26), there was a

significant improvement in the anal caliber between preoperative and postoperative values ($p < 0.0001$).

As well our results were supported by Farid et al. [9] who reported that the Preoperative anal caliber mean (range) was 10.8 ± 3.4 , and postoperatively at one month was 19.6 ± 3.1 (16–25), at 6 months was 18.2 ± 3.05 (17–27) and at 12 months become 18.1 ± 2.05 (16–27), there was a significant improvement in the anal caliber between preoperative and postoperative values ($p < 0.01$).

We also found that regarding Cleveland Clinic Incontinence Score (CCIS) we found that there was a high significant improvement in CCIS with a mean difference of CCIS from preoperative to 12 months of 7.55 ± 1.28 .

This was in agreement with the study by Gallo et al. [8] who revealed that the Preoperative Cleveland Clinic Incontinence Score (CCIS) mean (range) was 2.78 ± 3.4 (0–11) and at 12 months postoperatively it become 2.36 ± 2.8 (0–9), they found that CCIS values differed significantly after surgery (p value < 0.05).

Furthermore, Farid et al. [9] reported significant differences were seen among house flap, rhomboid flap, and Y-V anoplasty groups in rate of clinical improvement. Of patients in the house flap group, 19 (95%) had clinical improvement at 1 month after surgery. One patient (5%) developed postoperative flap ischemia and wound sepsis with disruption of suture lines and still reported painful evacuation postoperatively. In the rhomboid flap group, 4 patients (20%) did not show clinical improvement at 1 month and had developed ischemia at the tip of the flap with disruption of suture lines. These patients reported persistent painful evacuation postoperatively and had recurrence at 1 year of follow up. In this group, the number of patients with clinical improvement dropped from 16 patients (80%) at 1 month after the procedure to 12 patients (60%) after 1 year. In the Y-V anoplasty group, 7 patients (35%) reported no improvement at 1 month and still had painful evacuation 1 year after the operation. In this group, 4 patients developed postoperative disruption of suture lines, caused by infection (sepsis) in 1 patient (5%) and ischemic tip (15%) in 3 patients.

As regard post-operative complications of the studied cohort, we found that the most of patients had no complications. There was one (5%) patient had wound infection, one (5%) patient suffered from flap necrosis and one (5%) patient suffered from restenosis. Gallo et al. [8] stated that several

complications have been recorded following surgical intervention for anal stenosis., Liberman and Thorson documented several mild and moderate problems after any type of anoplasty operation such as infection, pruritus, transitory minor incontinence, and/or excessive granulation tissue at the donor site. One patient in their study suffered donor site ischemia, and two others had wound dehiscence that healed by secondary intention.

In addition, Sloane et al. [10] reported that during admission, no general or flap-specific problems were observed. The patients were followed up on four weeks after surgery, as well as four and twelve months afterwards. The whole cohort showed considerable improvements in their symptoms and the ability to pass stools easily.

We believe that using a flap, which we have termed a 'tailored rhomboid,' can assist to increase the percentage of successful outcomes in the surgical intervention of anal stenosis. The ability to tailor the size of the flap to the particular patient (depending on its form) is, in our view, a huge benefit in avoiding problems and disappointing functional results. To obtain optimal outcomes, the flap must have a sufficient blood supply, no tightness in the suture line, and attentive postoperative local care. In our study, 96 % were effectively treated, resulting in the removal of their painful and difficult defecation condition.

5. Conclusion

The use of Rhomboid Island Flap Anoplasty is a safe and suitable option for the treatment of mild, moderate and severe Post-Hemorrhoidectomy Anal Stenosis. The possibility of tailoring the flap based on the degree as well as the level of Anal Stenosis is the key.

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