

Posthemorrhoidectomy anal stenosis diamond flap versus V-Y flap: A prospective randomized study

Original
Article

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ABSTRACT

Background: Anal stenosis is diagnosed when there is a narrowing of the anal canal and subsequent loss of normal elasticity that makes its wall rigid and unable to be dilated to permit normal pain-free defecation. This work aimed to evaluate the outcomes of diamond flap versus V-Y flap for treatment of severe posthemorrhoidectomy anal stenosis.

Patients and Methods: This prospective randomized study was carried out on 52 patients aged from 15 to 70 years old, both sexes, diagnosed with severe anal stenosis after hemorrhoidectomy. Patients were randomly allocated into two equal groups: group A (diamond flap group) underwent diamond flap, and group B (V-Y flap group) underwent the V-Y flap. All patients were subjected to: history taking, clinical examination, routine preoperative laboratory investigations, anesthetic assessment, and preoperative bowel preparation.

Results: Both procedures were associated with a significant increase in anal caliber measurements ($P < 0.001$). However, the improvement was more noticeable in the diamond flap group ($P < 0.05$). It increased from 10.5 mm before the procedure to 20.19 and 21.5 mm after one and six months, respectively. The same three readings were 10.62, 18.35, and 18.73 mm, respectively, in the V-Y group. There were significant differences regarding time to complete wound healing, and wound dehiscence ($P < 0.05$).

Conclusion: Both Diamond and V-Y flap approaches are safe and efficacious in the management of severe posthemorrhoidectomy stenosis. However, the former is associated with better outcomes manifested in increased anal caliber, decreased morbidity rate, and decreased postoperative recurrence.

Key Words: Anal stenosis, diamond flap, V-Y flap, posthemorrhoidectomy.

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INTRODUCTION

Anal stenosis is diagnosed when there is a narrowing of the anal canal and subsequent loss of normal elasticity that makes its wall rigid and unable to be dilated to permit normal pain-free defecation^[1].

In anatomical anal stenosis, the normal elastic anoderm replaced by an inelastic rigid fibrous tissue is the major cause of the anal canal narrowing^[2].

Benign stenosis of the anal canal affects 1.5–3.8% of patients after surgical hemorrhoidectomy^[3]. It is a rare disabling condition causing the patient a lot of discomfort, and patients usually complain of anal pain, difficult defecation, and incomplete evacuation with narrow stools caliber. Most patients will become habitual users of laxatives and enemas. It has been reported that hemorrhoidectomy accounts for about 90% of anal stenosis cases^[4,5].

The severity of postsurgical anal stenosis is classified into three degrees: (a) mild stenosis: tight anal canal that can admit well-lubricated index finger or medium size Hill–Ferguson retractor, (b) moderate stenosis: the lubricated index finger or the medium size Hill–Ferguson retractor can only be admitted after forceful dilatation of the anus, (c) severe stenosis: neither the lubricated little finger nor the small Hill–Ferguson retractor can be admitted^[3].

While mild to moderate anal stenosis can be managed with conservative strategies including bulking agents, alone or in combination with anal dilation or lateral internal sphincterotomy, surgery still represents the mainstay of treatment for moderate to severe anal stenosis refractory to conservative approaches^[2]. Many procedures have been described in the literature for repair of severe anal stenosis, including mucosal advancement flap, V-Y flap, diamond flap, U-shaped flap, and house flap^[6].

Despite the reported good results (60–100% healing rate) of these procedures, many complications have been reported like anal mucosal ectropion, seepage of mucus or liquid stools, pruritus, suture dehiscence, flap retraction, ischemic necrosis, especially at the corners of the flaps, donor site infection, incontinence, and restenosis^[4,7,8].

That was a good motive for us to conduct the present study to elucidate which technique is associated with better outcomes in patients with severe anal stenosis.

This work aimed to evaluate the outcomes of diamond flap versus V-Y flap for treatment of severe post hemorrhoidectomy anal stenosis.

PATIENTS AND METHODS:

This prospective randomized study was carried out on 52 patients aged from 15 to 70 years old, both sexes, diagnosed with severe anal stenosis after hemorrhoidectomy based on Milsom and Mazier classification^[9] after the failure of non-operative measures were included.

Informed written consent was obtained from the patient. The study was done after approval from the Ethical Committee and Institutional Review Board (IRB) of General Surgery Department, Assiut University Hospitals (approval code:) from July 2021 to July 2023.

Exclusion criteria were patients with functional stenosis as acute anal fissure, a recent history of anal stenosis who had no medical treatment trial, mild or moderate anal stenosis who expected to respond to medical treatment, inflammatory bowel disease, tuberculosis, or perianal fistula, previous radiotherapy or previous anal malignancy, and previous anoplasty.

Grouping and randomization

Randomization was done by a computer-generated system. The list was concealed in sealed envelopes that were numbered and opened sequentially after obtaining patient's consent. Patients were randomly allocated using computer-generated randomization tables into two equal groups: group A (Diamond flap group) underwent the diamond flap, and group B (V-Y flap group) underwent the V-Y flap.

All patients were subjected to: history taking [personal history, current complaint including constipation, painful evacuation, anal bleeding, diarrhea, etc, duration elapsed since the previous hemorrhoidectomy procedure, current medical comorbidities, and previous surgical history], clinical examination [general examination, local perianal examination, anal caliber was measured for (the lubricated calibrator was inserted into the anal canal and gently pushed in only as far as it would go without depressing

or distorting the perianal area around the calibrator. The diameter was then read from the ring at the anal outlet), anoscopy or proctoscopy], routine preoperative laboratory investigations, and preoperative bowel preparation with a soft diet the day before the operation was done for all patients. Additionally, all patients received a single enema the night before surgery.

The surgical procedure

All operations were done under spinal anesthesia and in a lithotomy position. A single third-generation cephalosporin (1 g) injection and metronidazole (500 mg) infusion were commenced for all patients at the time of skin incision.

The diamond flap procedure

The procedure started with making a 5 cm longitudinal incision in the fibrotic tissues (vertical to the dentate line) at 3 o'clock position starting from the dentate line inside the anal canal (~2–3 cm) to the apex of the flap outside the anal canal (~2–3 cm) depending on the extent of fibrosis. Partial lateral internal sphincterotomy was done to achieve adequate anal dilatation. A diamond-shaped flap was done adjacent and lateral to the incision made in the previous step and at the same level with each limb 5 cm in length, avoiding making a narrow base down to the subcutaneous tissue with good mobilization of the flap to achieve adequate approximation and good suturing without tension with interrupted 3-0 vicryl suture, making sure that the flap angle covers at least 2 cm above the anal verge after ensuring good hemostasis. The defect lateral to the flap was sutured in the same manner.

The V-Y flap procedure

A Y-shaped incision started in the anal canal with the two limbs of the Y extending out into the perianal skin. Laterally, a full-thickness triangular skin flap with 1 to 2 mm of subcutaneous fat was mobilized of importance to keep the flap wide to minimize the risk of the loss of the flap secondary to ischemic necrosis. The leading edge of the flap was as wide as the defect created after scar incision and dilatation. The length of the flap was approximately twice the width of the leading edge, and the base was at least equal to the length. The angled leading edge of the flap was approximated to rectal mucosa at the mucocutaneous junction (Dentate line) with 3/0 vicryl sutures. The lateral perineal cross limb of the Y was approximated under minimal tension with interrupted simple 3/0 vicryl sutures (Figs 1 and 2).



Fig. 1: (A) Preoperative photo showing anal stenosis. (B and C) Intraoperative steps for the diamond flap. (D) Postoperative photo at follow-up.

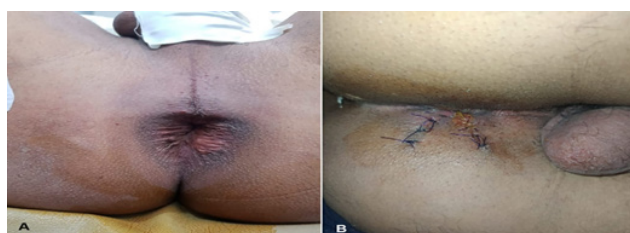


Fig. 2: (A) Preoperative photo showing anal stenosis. (B) After performing the V-Y flap procedure.

Postoperative care

All patients were transferred to the recovery room then to the internal ward where close monitoring was done. Analgesia was achieved by oral paracetamol (1 gm/8 h) and oral diclofenac (50 mg/12 h). Postoperative pain was assessed via the visual analog scale (VAS) with 0 for no pain and 10 for the worst pain ever felt. Oral fluid intake was allowed six hours after the procedure. The patients were ordered to take only fluid for 3–4 days after the procedure, followed by semisolid food for one month. Then, solid intake was allowed. Most patients were discharged with 2–4 days after the procedure, unless complications were encountered. All patients were commenced on oral ciprofloxacin (500 mg twice daily) and oral metronidazole (500 mg three times/day) for five days after the procedure. Additionally, laxatives were commenced for at least one week after the procedure.

Follow-up

Follow-up visits were arranged after 1 week, 2 weeks, 1, 3, and 6 months. During these visits, a clinical assessment of the patients was done. Additionally, VAS score was assessed. The incidence of clinical improvement was recorded. It was established if they showed no straining, no sense of anorectal obstruction, defecation became more than three times per week, and spontaneous evacuation following high-fiber meals or bulk laxatives was observed^[10]. Prevention of recurrence by regular anal dilatation. Results were considered unsuccessful

(no improvement) when patients reported frequent painful evacuation for which oral osmotic laxatives, suppositories, or enema administration were required, or when a late reoperation was required^[10]. The duration needed for complete wound healing was recorded in both groups. Complete wound healing was defined as complete epithelialization of the wound with no evidence of external fistula opening or perianal discharge^[11]. Healing was considered to be delayed if the wound had not completely healed by 6 weeks after the procedure^[10]. Anal canal caliber was assessed using the same way used during the preoperative period, we used a numerically graduated metal dilators as a calibrator (Fig. 3). It was recorded after 1 and 6 months. Postoperative incontinence was assessed via the Wexner questionnaire^[12]. The incidence of other complications including bleeding, surgical site infection, wound dehiscence, flap ischemia, and recurrence was noted and recorded. At the last follow-up, the patients were asked to subjectively express their satisfaction on a five-point Likert scale as follows; very satisfied, satisfied, neutral, dissatisfied, and very unsatisfied^[13].

The study outcome was operative time, the duration of hospitalization, the incidence of complications, recurrence rate, and patient satisfaction.



Fig. 3: A numerically graduated metal dilators marked from 1 to 18 according to the size.

Sample size calculation

Based on determining the main outcome variable, the estimated minimum required sample size was 52 cases (26 in each group). The sample size was calculated using G*Power software (latest ver. 3.1.9.7; Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany), based on the following assumptions: The main outcome variable is difference in complications rate in diamond flab surgery and other surgeries for treatment of anal stenosis after hemorrhoidectomy. As reported by previous study, the 1-month complication rate was 10% in diamond flab surgery and there's no study show complications rate in other surgeries, so it was estimated to be 50%.

Statistical analysis

Statistical analysis was done by SPSS v28 (IBM, Armonk, New York, USA). Shapiro–Wilks test and histograms were used to evaluate the normality of the distribution of data. Quantitative parametric data were

presented as mean and standard deviation (SD) and were analyzed by analysis of variance (F) test with post hoc test (Tukey). Quantitative nonparametric data were presented as median and interquartile range (IQR) and were analyzed by Kruskal–Wallis test with Mann–Whitney test to compare each group. Qualitative variables were presented as frequency and percentage (%) and were analyzed utilizing the χ^2 test. A two tailed *P* value less than 0.05 was considered statistically significant.

RESULTS:

In this study, 73 patients were assessed for eligibility, 12 patients did not meet the criteria and nine patients refused to participate in the study. The remaining 52 patients were randomly allocated into two groups (26 patients in each). All patients enrolled in the study underwent bilateral flap except one case in V-Y flap group in which unilateral flap was sufficient. All allocated patients were followed-up and analyzed statistically (Fig. 4).

Table 1 shows no significant differences regarding baseline data [Age, sex (male, and female), BMI, comorbidities (diabetes mellitus, hypertension, and smoking), clinical presentation [duration elapsed since

hemorrhoidectomy (months), clinical presentation (constipation, painful evacuation, and bleeding), preoperative anal caliber], operative time and hospitalization period.

VAS score changes were insignificantly different between both groups (Table 2).

Both procedures were associated with a significant increase in anal caliber measurements ($P < 0.001$). However, the improvement was more noticeable in the diamond flap group ($P < 0.05$). It increased from 10.5 mm before the procedure to 20.19 and 21.5 mm after one and six months, respectively. The same three readings were 10.62, 18.35, and 18.73 mm, respectively, in the V-Y group. There were significant differences regarding time to complete wound healing, and wound dehiscence ($P < 0.001$, 0.004 , respectively), while no significant differences regarding clinical improvement, preoperative changes in anal caliber postoperative complications (Bleeding, infection, wound dehiscence, gas incontinence, flap necrosis, and recurrence), and patient satisfaction (Very satisfied, satisfied, neutral, dissatisfied, and very dissatisfied) (Table 3).

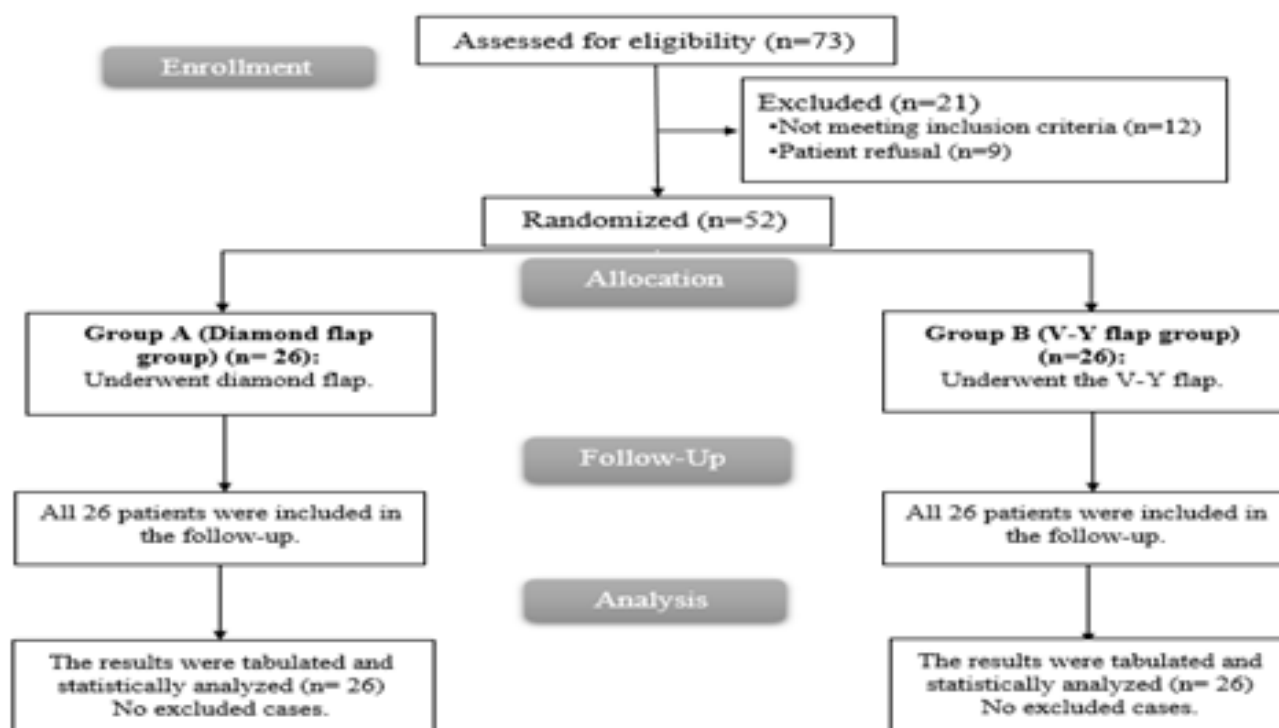


Fig. 4: CONSORT flowchart of the studied patients.

Table 1: Comparison between both groups regarding baseline data, clinical presentation, operative time, and hospitalization period (n=52)

| | Group A (n=26) | Group (B) (n=26) | P value |
|--|----------------|------------------|---------|
| Baseline data | | | |
| Age (years) | 42.31±4.70 | 43.92±5.18 | 0.244 |
| Sex | | | |
| Male | 10 (38.46) | 11 (42.31) | 0.777 |
| Female | 16 (61.54) | 15 (57.69) | |
| BMI (kg/m ²) | 28.39±3.60 | 29.68±4.74 | 0.275 |
| Comorbidities | | | |
| DM | 5 (19.23) | 6 (23.08) | 0.734 |
| HTN | 6 (23.08) | 6 (23.08) | 1 |
| Smoking | 4 (15.38) | 5 (19.23) | 0.714 |
| Clinical Presentation | | | |
| Duration elapsed since hemorrhoidectomy (months) | 17.96±3.90 | 18.04±3.73 | 0.942 |
| Clinical presentation | | | |
| Constipation | 26 (100) | 26 (100) | – |
| Painful evacuation | 26 (100) | 26 (100) | – |
| Bleeding | 20 (76.92) | 21 (80.77) | 0.734 |
| Preoperative anal caliber (mm) | 10.50±1.70 | 10.62±1.86 | 0.816 |
| Operative time (min) | 73.08±9.28 | 73.65±9.44 | 0.825 |
| Hospital stay (days) | 3 (2–4) | 3 (2–4) | 0.708 |

Data are presented as mean±SD, median (IQR) or frequency (%).
 BMI, Body mass index; DM, diabetes mellitus; HTN, hypertension.

Table 2: Comparison between both groups regarding visual analog scale score changes

| | Group A (n=26) | Group (B) (n=26) | P value |
|---------------------------|----------------|------------------|---------|
| Immediately postoperative | 5 (4–8) | 5 (4–8) | 0.955 |
| 1 week | 4 (3–6) | 4 (3–6) | 0.616 |
| 2 weeks | 4 (3–6) | 4 (3–6) | 0.642 |
| 1 month | 2 (2–5) | 2 (2–5) | 0.794 |
| 3 months | 2 (1–3) | 2 (1–4) | 0.771 |
| 6 months | 0 (0–2) | 0 (0–3) | 0.722 |

Table 3: Comparison between both groups regarding postoperative outcomes, changes in anal caliber at follow-up

| | Group A (n=26) | Group (B) (n=26) | P value |
|--|----------------|------------------|---------|
| Postoperative outcomes | | | |
| Clinical improvement | 25 (96.15) | 22 (84.62) | 0.158 |
| Time to complete wound healing (weeks) | 5 (4–6) | 6 (5–8) | <0.001* |
| Wound dehiscence | 0 | 7 (26.7) | 0.004* |
| Changes in anal caliber | | | |
| Preoperative | 10.50±1.70 | 10.62±1.86 | 0.816 |
| 1 month | 20.19±2.70 | 18.35±3.63 | 0.043* |
| P value | <0.001* | <0.001* | |
| 6 months | 21.50±2.94 | 18.73±3.53 | 0.003* |
| P value | <0.001* | <0.001* | |
| Preoperative | 10.50±1.70 | 10.62±1.86 | 0.816 |
| Postoperative complications | | | |

| | | | |
|----------------------|-----------|------------|-------|
| Bleeding | 2 (7.69) | 3 (11.54) | 0.638 |
| Infection | 3 (11.54) | 4 (15.38) | 0.685 |
| Wound dehiscence | 0 | 7 (26.7) | 0.313 |
| Gas incontinence | 1 (3.85) | 1 (3.85) | 1 |
| Flap necrosis | 0 | 0 | – |
| Recurrence | 1 (3.85) | 4 (15.38) | 0.158 |
| Patient satisfaction | | | |
| Very satisfied | 8 (30.77) | 6 (23.08) | 0.654 |
| Satisfied | 8 (30.77) | 6 (23.08) | |
| Neutral | 6 (23.08) | 7 (26.92) | |
| Dissatisfied | 3 (11.54) | 3 (11.54) | |
| Very dissatisfied | 1 (3.85%) | 4 (15.38%) | |

Data are presented as mean±SD, median (IQR) or frequency (%).

*Significant as *P* value less than 0.05.

DISCUSSION

Anatomical anal stenosis is a rare but severe sequela of several surgical procedures targeting the anal canal. This condition may severely affect a patient's quality of life due to difficulty in rectal emptying, altered stool consistency, bleeding, pain, and the need for chronic use of laxatives^[2].

In our study, the duration elapsed between hemorrhoidectomy, and patient presentation had a mean value of 17.96 months in the diamond group, compared with 18.04 months in the V-Y group. In another study, the mean interval between surgery and presentation of anal stricture was 6 weeks (range 3–12 weeks)^[14].

The timing of when anal stenosis could develop after a hemorrhoidectomy can vary from person to person. In some cases, it may develop relatively soon after the surgery, while in others, it may take several weeks or months to become noticeable. The exact timing can depend on factors such as individual healing rates, the extent of tissue scarring, patient awareness, and the presence of any complications during the healing process.

In the current study, all patients in both study groups complained of constipation and painful evacuation, and this is in agreement with Tahamtan and his associated^[15] who reported the presence of the same two complaints in their included 25 anal stenosis patients^[16]. Filingeri *et al.* reported similar findings.

In the current study, anal bleeding was reported by 76.92% of the diamond cases and 80.77% of the V-Y cases. Shehata *et al.*^[8] also reported the incidence of the same presentation in 86% of their included 14 cases.

In the current study, the mean duration of the surgical procedure was 73.08 min in the diamond group, compared with 73.65 min in the V-Y group, with no significant difference in the statistical analysis.

In contrast to our findings, Farid *et al.*^[10] reported that the operative time was longer in the diamond flap compared with the V-Y flap (44±13 vs. 35±9 min, respectively, *P*=0.042). Changes in surgical expertise, disease criteria, surgical place ergonomics, and the incidence of intraoperative complications could attribute to differences among studies regarding the duration of the surgical procedure.

Our findings revealed a comparable hospitalization period between the two groups, which ranged between two and four days. In the study conducted by Ahmed and his associates^[17], the mean duration of hospitalization was 1.85±0.37 days and ranged from 1 to 2 days after flap-based procedures for anal stenosis.

One could expect some differences between studies regarding that parameter, that could differ according to patient status, center protocol, and the incidence of postoperative complications.

Our findings revealed that both procedures were associated with a significant increase in anal caliber measurements (*P*<0.001). However, the improvement was more noticeable in the diamond flap group (*P*<0.05). It increased from 10.5 mm before the procedure to 20.19 and 21.5 mm after 1 and 6 months, respectively. The same three readings were 10.62, 18.35, and 18.73 mm, respectively, in the V-Y group.

In the same context, Farid and his associates^[10] reported a significant increase in anal caliber measurements after both flap procedures. Despite improvement in both groups, the results were significantly better in the diamond flap group (*P*<0.05).

Our findings revealed the increased clinical improvement rates in association with the diamond flap approach (96.15 vs. 84.62% in the V-Y flap).

Jongen^[18] reported higher clinical improvement after 1 month in association with the diamond flap approach (80% vs. 65% in V-Y anoplasty in the groups), and the differences existed after 1 year.

We noticed a significant decline in pain scores in association with both groups after the procedure, and that was evident after one month, as all patients had mild pain on the used VAS score.

Of course, it is reasonable for all patients to have moderate to severe pain during the early postoperative period secondary to tissue trauma in that area rich with sensory nerve supply. Acute anal pain is common following anorectal surgery, particularly after hemorrhoidectomy, but this generally resolves completely within 3-4 weeks^[19].

After the end of the acute postoperative phase, patients will report decline in their pain. Anal pain typically decreases after surgery for anal stenosis due to several reasons. Surgery for anal stenosis involves removing or modifying the narrowed or scarred tissue that is causing the constriction of the anal canal. By addressing the underlying cause of the stenosis, the surgical procedure aims to relieve the pressure and compression on the sensitive nerve endings in the anal area, thereby reducing pain. The surgical procedure prompts the body's natural healing process. As the surgical site heals, inflammation and swelling decrease, leading to a reduction in pain. The removal or modification of the stenotic tissue allows for better tissue remodeling and restoration of the anal canal's normal anatomy, which can alleviate pain.

In the current study, postoperative bleeding occurred in 7.69% of cases in the diamond group, compared with 11.54% of cases in the V-Y flap group, with no significant difference in the statistical analysis. All of these manifestations were mild and temporary and responded successfully to haemostatics and compression therapy.

In the study conducted by Shehata^[8], postoperative bleeding occurred in two cases (14%) who experienced spotting after defecation that stopped spontaneously over the first few days.

Our findings showed the incidence of wound infection in 11.54 and 15.38% of cases in the diamond and V-Y flap groups respectively, which was comparable in the statistical analysis ($P > 0.05$). Our incidence of that complication lies within the reported range of wound infection after anorectal surgery in the

literature, which ranges from 3 to 30% and up to 40% in the absence of antibiotics^[20].

Our findings revealed the incidence of wound dehiscence in seven (26.7%) patients in the V-Y flap group versus no cases in the diamond flap group. Similarly, Maria *et al.*^[21] concluded that, although both V-Y and diamond flap anoplasty were satisfactory, but diamond flap anoplasty provided reduced tension at the suture line and a better blood supply to the flap and therefore seemed more reliable.

In the current study, we did not encounter any cases with flap ischemia in either of the study groups. On the other hand, Angelchik *et al.*^[22] used V-Y anoplasty or a diamond-shaped pedicle advancement flap to treat 19 patients with anal stenosis or ectropion. The authors reported complications in three patients after V-Y anoplasty and suggested that the risk of flap necrosis is less with the diamond flap than with the V-Y technique.

In the current study, we noticed no significant difference between the two approaches regarding the incidence of postoperative incontinence that was detected in 3.85% of patients in each group. These cases had only temporary incontinence to flatus that faded during the follow-up.

In the current study, the V-Y approach was associated with an increased risk for delayed wound healing, as it was encountered in 26.7% of cases in the V-Y flap group versus no cases diamond flap group. Also, the duration to wound healing showed a significant prolongation in the V-Y group.

In our opinion, there are a few reasons why V-Y flap procedures may be associated with a higher risk of delayed healing compared with diamond flap procedures. The V-Y flap involves mobilizing tissue from the nearby anal or perianal region and rotating it to reconstruct the anal canal. The blood supply to the flap relies on the surrounding blood vessels. However, the vascular anatomy in the area may be limited, and the blood supply to the V-Y flap can be more susceptible to compromise, leading to relative ischemia and delayed healing.

The V-Y flap technique may require more stretching or tension on the blood vessels that supply the flap. Increased tension can reduce blood flow to the flap and increase the risk of delayed healing. Moreover, the pedicle, which connects the flap to its blood supply, is typically longer in V-Y flap procedures compared with diamond flap procedures. The longer pedicle can make the blood supply more vulnerable to compromise, especially if there is any twisting or kinking of the blood vessels during the surgery.

Our findings contradict with Farid and his associates^[10] who reported that delayed healing was more encountered in the diamond group (15 vs. 10% in the V-Y group). Nonetheless, that difference turned out to be insignificant in the statistical analysis ($P=0.07$).

Our findings showed the increased recurrence rate in association with the V-Y procedure (15.38 vs. 3.85% in the other group). In line with our findings, Omar reported that the incidence of restenosis was higher in the V-Y flap group (30 vs. 0% in the diamond flap group)^[23].

Recurrence rates of anal stenosis can depend on various factors, including the underlying cause of stenosis, the surgical technique used, individual patient characteristics, and postoperative care. Factors such as wound healing, tissue scarring, and the underlying condition can contribute to the risk of recurrence. As the V-Y flap procedure is associated with more delayed wound healing and wound complications than the diamond flap, it is expected to encounter more postoperative fibrosis with the V-Y flap leading to an increased risk of postoperative recurrence. Our findings revealed that the prevalence of patients reporting high satisfaction and satisfaction was higher in association with the diamond flap. That could be secondary to the lower complication rate, lower recurrence rate, and increased anal diameter associated with the same approach.

We recommend that More studies including more cases from different surgical centers should be conducted in the future, these studies should assess intermediate and long-term follow-up, and both diamond and V-Y flap procedures should be compared with other flap-based procedures to elucidate which is the best for patients with severe anal stenosis.

Limitations

The relatively small sample size collected from one surgical institution is the main drawback. Also, it lacks intermediate and long-term follow-up. More studies including more cases from different surgical centres should be conducted to cover the previous limitations.

CONCLUSION

Both Diamond and V-Y flap approaches are safe and efficacious in the management of severe posthemorrhoidectomy stenosis. However, the former is associated with better outcomes manifested in increased anal caliber, decreased morbidity rate, and decreased postoperative recurrence.

CONFLICT OF INTEREST

There are no conflicts of interest.

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