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RESEARCH ARTICLE

ROLE OF SIMULTANEOUS V-Y ADVANCEMENT FLAP DURING HEMORRHOIDECTOMY MILLIGAN-MORGAN IN PREVENTING ANAL STENOSIS

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Abstract

Background: Haemorrhoidectomy is the most effective and definitive treatment for Grade III and Grade IV haemorrhoids. Stenosis can complicate a radical amputative haemorrhoidectomy in 5%-10% of cases. The principle of anoplasty consists of increasing the diameter of the anal outlet and removal of cutaneous scarring by proximal or distal advancement flaps, thus decrease the severity of symptoms and restore normal function to the anus.
Objective: We evaluated the success rate of Y-V advancement flap anoplasty in prevention post-haemorrhoidectomy anal stenosis (the most important complication of the procedure).
Methods: A randomized controlled study was carried out among 80 patients, between September 2015 and September 2016, were treated surgically for grade III and IV haemorrhoids at the Department of General Surgery at Zagazig University Hospitals. Patients were
Results: All our patients completed the scheduled follow-up of 12 months. All patients in our study were given spinal anesthesia. All patients in our study were put in lithotomy position intraoperative. The operative time was (32.61±2.89) (30-45) in the conventional group vs (16.84±1.98) (15-18) in the control group with a significant difference. Anal stenosis was observed in one patient (2.5%) in the conventional group vs 9 patients (22.5%) in the control group with significant difference (P value=0.017).
Conclusion: Despite the extensive destruction of anoderm occurring during excision of large haemorrhoids, the wound healing is fairly un-problematic ,when simultaneous V-Y advancement flap anoplasty, and the risk of developing anal stenosis is in fact very small.

Introduction:-

Haemorrhoids are cushions of specialized submucosal vascular tissue located in the anal canal, and are one of the most common anorectal disorders [1].

The haemorrhoidal disease is a very common anorectal disorder, occurring in approximately 5% of the general population, and more frequently in individuals who are older than 40 years [2]. Haemorrhoidal symptoms may include bright red bleeding from the rectum, mucous discharge, perianal irritation or pruritus, perianal pain, prolapse of the haemorrhoidal cushions, or protruding mass, soiling and difficulties with hygiene [3].

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The surgical treatment is used in about 5–10% of cases in which the conservative treatment had no effect; patients with symptomatic or acute Grade III or IV haemorrhoids who have not improved with other treatments are elected for the procedure[4]. Haemorrhoidectomy is the most effective and definitive treatment for Grade III and Grade IV haemorrhoids [5].

Hundreds of studies have been published comparing the surgical treatments available for grade III and IV haemorrhoids, including: open haemorrhoidectomy [6], closed haemorrhoidectomy [7], submucosal haemorrhoidectomy [8], stapled haemorrhoidectomy [9]. At present, the traditional surgical approaches include the open (Milligan–Morgan) and the closed (Ferguson and Parks) haemorrhoidectomy [10].

Open haemorrhoidectomy, as described by Milligan et al in 1937, has been accepted worldwide as the best choice for the treatment of symptomatic haemorrhoids[11].

Anal stenosis can be a debilitating disease and occurs as a result of the narrowing of the anal canal due to contraction of the epithelial lining that has been replaced by fibrous connective tissue [12]. The underlying sphincter mechanism may also be damaged with hemorrhoidectomy, resulting in severe stenosis.

Stenosis can complicate a radical amputative hemorrhoidectomy in 5%-10% of cases[13], particularly those in which large areas of anoderm and hemorrhoidal rectal mucosa from the lining of the anal canal is denuded, but can also occur after other anorectal surgical procedures.

Patients with anal stenosis often complain of painful bowel movements, constipation, obstipation, narrow caliber of stool, tenesmus, diarrhea, fecal leakage, or bleeding [14].

Physical examination is obviously very important in making the diagnosis and identifying the cause of anal stenosis. Inspection of the anal canal will reveal a narrowing of the anal opening with circumferential fissure formation seen from the parting of the gluteal folds[15].

Classification of anal stenosis based on the level of involvement includes low (at least 0.5 cm distal to the dentate line), middle (0.5 cm distal and proximal to the dentate line), and high (0.5 cm above the dentate line) [14]. Classification of anal stenosis according to the severity is shown in Table 1 [16].

Table 1:-Classification of anal stenosis.

Mild	Stenotic anal canal can be examined by a well-lubricated index finger
Moderate	Forceful dilatation is required to do a digital rectal examination
Severe	Digital rectal examination is impossible

Surgical repair of anal stenosis with advancement and rotational flaps involving skin, mucosa or both has a success rate of more than 80% with low morbidity, complete resolution of symptoms and good acceptance from the patient [17].

Anoplasty aims to solve stenosis and to prevent its relapse respecting the normal anal anatomy in order not to damage normal sphincterial mechanism. Many techniques have been described for the management of this disorder, and good results have been reported in several series [18]. V-Y advancement flap anoplasty has been used in the treatment of severe low anal stenosis with better results.

Study objectives

In this study, we evaluated the successful rate of Y-V advancement flap anoplasty in prevention post-haemorrhoidectomy anal stenosis (the most important complication of the procedure).

The outcome measures analyzed were based on the endpoints of the trials. The primary outcome measure was anal stenosis. A patient was considered healed without stenosis, if symptom-free or with minimal symptoms not requiring treatment at the end of the study period. Other outcome measures considered were operative time and hospitalization, wound complications, postoperative bleeding, wound healing and postoperative pain.

Patients And Methods:-

Between September 2015 and September 2016, a total of 80 patients were treated surgically for grade III and IV haemorrhoids at the Department of General Surgery at Zagazig University Hospitals . Patients were examined at 1 month, 6 months, and 1 year after surgery.

Evaluation parameters included age, sex, duration of symptoms, study design, disease grade, date of surgery, operative details, operative time, duration of hospitalization, return to daily activities, postoperative complications, and postoperative pain. Short and long-term complications were assessed on follow-up outpatient visits at postoperative Month 1, Month 6, and Month 12.

The exclusion criteria were previous anorectal surgery, acute thrombosed hemorrhoid, inflammatory bowel disease, Tuberculosis, previous radiotherapy, concomitant anal diseases such as anal fistula, or abscess, hematologic disease, anticoagulant use, and cancer.

Medical history and current symptoms were investigated in detail. Detailed physical examination and rigid recto-sigmoidoscopy were performed on all patients. All patients with an indication for surgical treatment was informed about the procedures. Purgative enema was applied 1 day prior to the surgery.

In all cases with anal stenosis, the diagnosis was based on clinical examination. Patients complained of pain, bleeding, and difficulty during defecation and increase stool frequency. Digital examination with the little finger and endoscopic evaluation with a rigid recto-sigmoidoscope 1 cm in diameter were possible in some patients with mild stenosis of the anal verge.

Prevention of anal stenosis should be discussed before treatment is addressed. With all perineal procedures, the surgeon should practice meticulous dissection, aiming to avoid excessive undermining or excision of normal anoderm and not injure the sphincter musculature. For example, during haemorrhoidectomy, viable tissue bridges should be preserved to assure proper healing and less scarring. It is critical that the surgeon not attempt to remove all hemorrhoids, especially in the setting of an acute exacerbation of the haemorrhoidal disease. At the completion of many anorectal operations, it is the authors' practice to assure easy passage of an operating anoscope or proctoscope.

Study design

A trial is a randomized controlled trial. Patients were randomized into equal two groups (40 patients for each group) using a computer- generated random number. The first (conventional) group will undergo simultaneous V-Y advancement flap and open (Milligan and Morgan) haemorrhoidectomy and the second (control) group will undergo open haemorrhoidectomy only.

Techniques

Open hemorrhoidectomy (Milligan and Morgan)

The open technique is considered the gold standard for the surgical treatment of grade IV hemorrhoidal disease. Initially, this technique was proposed by Salmon in 1830 and popularized since 1937 by Milligan and Morgan; basically it consists of the excision of the hemorrhoidal tissue with ligation and dissection of the vascular pedicle, leaving the wound open to heal by secondary intention[19].

Preoperative preparation:

Standard mechanical bowel preparation with water enemas before the operation to ensure cleansing of the distal rectal segment. Antibiotic prophylaxis was not used.

Patient position:

As with any surgical procedure, exposure is critical. Proper positioning of the patient is the key to good exposure and a successful outcome. We prefer the Lithotomy position with the buttocks retracted laterally with tape for better exposure.

Preparation and draping:

The perianal area is cleaned with betadine solution. We use four sterile paper towels and a single impervious sterile or drape is used with a large window fashioned for adequate exposure.

Anesthesia:
Spinal anesthesia was used in all our patients.

Steps :
After choosing the area, to decrease bleeding and facilitate mobilization and undermining of tissues (anal mucosa and perianal area), we used one vial of adrenaline (1:100,000) diluted in 10 ml of normal saline to infiltrate the anal submucosa up to the dentate line and horizontally for about 1.5–2 cm to the right and left of the injection site with the dual intention of facilitating the dissection and of limiting bleeding.

The first step is grasping the skin over each haemorrhoid is with artery force. The next step is to place a clamp at the dentate line. The next step consists of dissecting and individually ligating each pedicle with absorbable sutures, either 0 or 1 Vicryl®, swaged on a curved needle. Dissection with Mayo scissors should respect certain principles: • a cutaneous triangle is created, dissection progressively frees the flap from the underlying longitudinal muscular fibers; • the lower edge of the internal sphincter is identified and swept upwards with a gauze.

The next step consists of trimming the muco-cutaneous bridges with Metzenbaum scissors, in order to remove the underlying residual haemorrhoidal tissues. muco-cutaneous bridge is preserved between each dissected pedicle to maintain post-operative sensitivity and preclude strictures.

The next step consists of division of the pedicle with scissors or electrocautery, leaving a mucosal stump of approximately 5 mm and checking for complete haemostasis. The long ends of the knots can now be shortened to approximately 2 cm (they will be useful if there is ever need to control post-operative bleeding) and then the stumps are pushed back through the anal canal. Hemostasis is checked. The wounds are left open to granulate and a dressing is placed.

Post-operative care
In the immediate postoperative period, all patients require some form of bowel regimen to reduce the likelihood of constipation and impaction. Following immediate surgical recovery, patients are started on a high-fiber diet and may shower as per the usual routine.

Post-operative care consists of routine, sitz baths, twice a day routinely and after every bowel movement, using antiseptic and wound healing cream. Patients were discharged from the hospital after 24–48 h.

The anal verge dressing can be removed with the first bowel motion followed by regular sitz baths twice daily and after each bowel movement. The perianal wound is changed daily with non-adherent dressing until complete healing by secondary intention. A daily rectal digital examination should prevent early wound adhesions and preclude post-operative anal stricture. Postoperative evaluated in this study followed the linear visual analogue pain scale (VAS). The VAS scores were grouped as mild (0-3), moderate (4-6), and severe (7-10) [20].The analgesic given was diclofenac sodium with a maximum dose of 2.5 mg/kg/d (intramuscularly in the first 24 hours and via the oral route thereafter). In severe pain, opioid analgesic (pethidine 1 mg/kg) was given in one or two doses in the 1st day. Patients with moderate or high levels of pain requiring additional doses of analgesics were recorded.

All patients were evaluated weekly until complete operative wound healing was obtained and until 6 months after the operation. Three weeks after the beginning of the treatment, all patients were trained to carry out self-dilatation at home the day they did not attend the outpatient clinic. After the first four visits (when the pain in the area is less) and to ensure a successful outcome, the lubricated index finger gently passed through the anal verge. This will assure both the surgeon and the patient that there is no more stenosis.

Postoperative complications, defined as any deviation from the normal postoperative course[21]. Haemorrhoid operations, like all anorectal procedures, carry a general set of postoperative complications. These include bleeding, pain, and infection. In addition, hemorrhoid procedures convey additional risks of stenosis and incontinence. Anal stenosis, determined as the proportion of patients complaining of difficulty voiding owing to outlet obstruction or anal stenosis/stricture at follow-up.

Patients who were experiencing discomfort at follow-up were referred to the hospital for further examination as soon as possible. Stenosis was defined as a stricture of the lower rectum that cannot be passed by the finger.

V-Y advancement flap

A number of corrective surgical procedures have been designed aiming to bring a healthy lining to the narrowed portion of the anal canal. These flaps are classified as advancement, rotational, or adjacent tissue transfer flaps[14].

The ideal procedure should be simple, should lead to no or minimal early and late morbidity, and should restore anal function with a good long-term outcome.

We selected the V-Y anoplasty technique for its good long term results, our experience and low complications. Besides, this method can be performed on both anal sides in severe stenosis. The V-Y advancement flap anoplasty is best suited for widening the anal canal in patients with severe low anal stenosis. It is an alternative to Y-V anoplasty.

A V–Y advancement flap was scheduled and an enema was given preoperatively. The patient was placed in the lithotomy position . A V-shaped incision was made 1 cm away from the anal verge in the right lateral position (Fig. 2A). The flap included skin and subcutaneous fat and was mobilized sufficiently to create a tension-free anoplasty. Care was also taken during the dissection to preserve the vascular pedicles to ensure adequate blood supply. Vascular supply for these flaps is obtained from perforating vessels in the submucosal or subdermal vascular plexus or in subcutaneous tissues. Next, the base of the flap was sutured to the dentate line with 3-0 Vicryl_ sutures. The skin is then closed with 3-0 Vicryl_ sutures behind the V at the external portion of the perineum to push the V into the anal canal and widen the stenotic area(Fig. 3A).

At the end of the procedure, sterile gauze is soaked with 2% Xylocaine jelly, (with a packing of the anal canal) (Fig. 3A), and the remaining is used to cover the suture line with few other dry pieces on top followed by an Elastoplast to keep the dressings in place. The perianal wound is cleaned and covered with a non-adherent dressing, e.g., Sofra-tulle. The wounds remain open to heal by secondary intention. The patient was discharged on the first postoperative day after an uneventful course. After discharge, a high fiber diet was recommended.

Patients with post-haemorrhoidectomy anal stenosis (Fig. 1B)

Because of the tight anal orifice, no preoperative proctoscopy or digital examination was performed, and likewise, no cleansing rectal enemas were possible. Five days before the date of surgery, patients were advised to take stool softeners and be on a fluid diet with no fiber-containing food. They were admitted to the hospital 1 day prior to surgery. All patients received intravenous antibiotics (metronidazole 500 mg) 30 min before surgery, which was continued for 5 days postoperatively as 400 mg tablets three times daily. We selected the V-Y anoplasty technique for all our patients .

Statistical Analysis:-

Statistics were performed using SPSS software (release 15.0, SPSS Inc., Chicago, US). Patient characteristics and results were presented as mean ± standard deviation SD, and frequency with percentage. Pearson's Chi-squared tests (X2) and t-tests were used to evaluate significances when appropriate. A p-value of ≤ 0.05 was considered significant.

Results:-

All our patients completed the scheduled follow-up of 12 months. A planned number of 80 patients were enrolled in this study. The patients were randomized; 40 in the conventional (open hemorrhoidectomy and V-Y flap) group, 40 in the (control) group.

Regarding sociodemographic characteristics of patients as shown in table 2 ,results show that there was an insignificant difference regarding the mean age of patients (37.92± 9.46) in conventional group vs (38.38±5.91) in the control group,(p-value=0.792). Grade 3 haemorrhoids was in 18 patients in conventional group vs 19 in the control group. Grade 4 haemorrhoids was in 22 patients in conventional group vs 21 in the control group.

Intraoperative data and postoperative complications are listed in Table 3. All patients in our study were given spinal anesthesia. All patients in our study were put in lithotomy position intraoperative.

The operative time was (32.61 ±2.89) (30-45) in the conventional group vs (16.84±1.98) (15-18) in the control group with a significant difference. During the first 2 weeks, most patients reported moisture at the anal verge or

some yellowish-pink soiling of the underwear, with no stools or gas incontinence reported. By the third week, all patients were able to discontinue all types of stool softeners or laxatives; they continued to consume bulk forming diets (rich in fiber).

Pain on 7th- day postoperative was (1.5 ± 0.5) in the conventional group vs (1.6 ±0.45) in the control group (P=0.36). Pain on 14th- day postoperative was (0.1 ± 0.4) in the conventional group vs (0.11 ± 0.2) in the control group (P=0.88). Perianal pain was minimal during the first 14 days postoperatively which was well controlled by oral analgesics and local 2% Xylocaine jelly.

Non significant difference was detected in patients developing Surgical site infection in both groups. Surgical site infection was detected in 2 patients in the conventional group vs 4 patients in the control group (P=0.39). Non significant difference was detected in patients developing haematoma that was detected in in 2 patients in the conventional group vs 3 patients in the control group (P=0.64).Flap necrosis was detected only in one patient (7.2%) in the conventional group that treated by debridment. The hospital stay was (2.55±0.51) in the conventional group vs (1.3±0.41) in the control group with significant difference. Return to work activity was (12.33 ±1.5) in the conventional group vs (16.12 ±1.35) in the control group with significant difference.

Anal stenosis was observed in one patient (2.5%) in the conventional group vs 9 patients (22.5%) in the control group with significant difference (P value=0.017*). All of these patients complained of obstructive defecation and were found to have a stricture ring of the lower rectum that could not be passed by a finger. All cases with post-haemorrhoidectomy anal stenosis were treated by Y-V advancement flap anoplasty with better results. Wound healing was (19.02±0.85) in the conventional group vs (23.6 ±1.74) in the control group (P=0.00) with highly significant difference .

Table 2:-Patient characteristics

Variable	Conventional group (N=40)			Control group (N=40)		p-value
	No.	%		No.	%	
Age (years)						
Mean ± SD	37.92± 9.46			38.38±5.91		0.792
(Range)	(26 – 55)			(29 – 50)		
Gender						
Male	26	65%		19	47.5%	0.11
Female	14	35%		21	52.5%	
Grade of haemorrhoids						
Grade 3	18	45%		19	47.5%	
Grade 4	22	55%		21	52.5%	
Prior treatment						
None	40	100%		40	100%	1.0
Open hemorrhoidectomy	0	0%		0	0%	

N=Total number of patients in each group; Quantitative data were expressed as mean ± SD & median (range); Qualitative data were expressed as number (percentage); p-value< 0.05 is significant.

Table 3:-Intraoperative data and postoperative complications

Parameter	Conventional group (N=40)			Control group (N=40)		P-value
	No.	%		No.	%	
Anaesthesia						
General Anaesthesia	0	0%		0	0%	1.0
Spinal Anaesthesia	40	100%		40	100%	
Return to work activity (days)						
Mean ± SD	12.33 ±1.5			16.12 ±1.35		0.00**
(Range)	(10-15)			(14-19)		
Duration of operation (min)						

Mean ± SD	32.61 ±2.89			16.84±1.98		0.00**
(Range)	(30-45)			(15-18)		
Pain during 1st month postoperative (Mean ± SD)						,
7th- day	1.5 ± 0.5			1.6 ±0.45		0.36
14th- day	0.1 ± 0.4			0.11 ± 0.2		0.88
Position						
Lithotomy	40	100%		40	100%	1.0
Jack-knife	0	0%		0	0%	
Hospital stay (days)						
Mean ± SD	2.55±0.51			1.3±0.41		0.00**
(Range)	(2-3)			(1-2)		
Flap necrosis						
Absent	39	97.5%		40	100%	0.91
Present	1	2.5%		0	0%	
Haematoma of the surgical wound						
Absent	38	95%		37	92.5%	0.64
Present	2	5%		3	7.5%	
Surgical-site infection (no.)						
Absent	38	95%		36	90%	0.39
Present	2	5%		4	10%	
Stenosis						
Absent	39	97.5%		31	77.5%	0.017*
Present	1	2.5%		9	22.5%	
Wound healing (days)						
Mean ± SD	19.02±0.85			23.6 ±1.74		0.00**
(Range)	(18-20)			(21-26)		

N=Total number of patients in each group; Quantitative data were expressed as mean ± SD & median (range); Qualitative data were expressed as number (percentage); ** means that p value is highly significant; * means that p value is significant.

Discussion:-

Based on the degree of prolapse and the classification by Banov and colleagues[22], grade III and IV haemorrhoids (prolapsed haemorrhoids requiring manual reduction and non-reducible prolapsed haemorrhoids respectively) are amenable to surgical treatment.

Excisional hemorrhoidectomy, with either open or closed wounds, remains the “gold standard” to which all other surgical procedures must be compared.It remains the most commonly performed procedure for the definitive management of internal and/or external hemorrhoids. It has been reported that hemorrhoidectomy accounts for about 90% of anal stenosis cases [23].

Overzealous hemorrhoidectomy may denude large areas of anoderm and rectal mucosa from the lining of the anal canal, resulting in scarring and progressive chronic stricture formation making the anus less pliable[14].

In a series of 212 patients with anal stenosis, hemorrhoidectomy was identified as the underlying cause in 87.7% of cases[24].

Anal stenosis is one of the most disabling complications of anorectal surgery. We defined stenosis as a stricture that made it difficult to pass a finger on rectal examination.So, a patient’s complaint of obstructive defecation, together with the difficulty of the rectal examination, indicate that anal stenosis is present.The best treatment of postsurgical anal stenosis is prevention.Adequate anorectal surgery reduces the incidence of anal stenosis[25].

The history of the previous haemorrhoidectomy was the cause of anal stenosis in all our patients. However, a well carried out haemorrhoidectomy with delicate handling of the tissue, minimal tissue excision, correct follow up and minimum postoperative dilatation can prevent anal stenosis after haemorrhoidectomy[26].

Stenosis takes an average of at least six weeks to develop. If detected early, i.e. before complete healing of the haemorrhoidectomy wounds, stenosis can be treated by dilatation, initially digital and then using a medium-size anoscope under local anesthesia. In case of failure, surgical treatment may be necessary[27].

Casadesus et al. [28] described the successful management of four patients by a program of regular progressive self-dilatation using Hegar dilators. However, we suggest that Hegar dilators are a safe option when used by a surgeon under general anesthesia to avoid excessive manual dilatation as it results in tearing of the sphincter, resulting in further fibrosis and stricture.

Others have reported that manual dilatation can be responsible for major and minor complications with satisfactory results in only 28% of patients[29].

Khubchandani [30] condemned the use of manual dilatation under anesthesia for the non-operative treatment of mild to moderate stenosis because the resultant hematoma in the sphincter apparatus may cause fibrosis and progressive stenosis.

All patients with stenosis in our study had such severe anal stenosis that dilation was not possible because of the strong pain, and we do not agree with the use of dilation under anesthesia because of the possible complications., so they were treated by V-Y anoplasty. To prevent this potential complication of anal stenosis after the excision of large haemorrhoids, prophylactic tissue reconstruction with flaps and other plastic surgery techniques have been proposed by some authors [31].

The principle of anoplasty consists of increasing the diameter of the anal outlet and removal of cutaneous scarring by proximal or distal advancement flaps, thus decrease the severity of symptoms and restore normal function to the anus. Anoplasty can be divided into three categories: transverse closure, simple random flaps, and full- thickness advancement flap.

Full-thickness sliding advancement flaps are ‘island flaps’ that lack a skin bridge but receive their blood supply through a fatty vascular pedicle from the underlying muscle[32]. These include the V-Y, diamond[33] and ‘house advancement pedicle flap’ anoplasty[32].

As stated by Brisida et al. [34] ‘‘the ideal procedure should be simple, should lead to no or minimal early and late morbidity, and should restore anal function with good long-term outcome.’’ Milsom and Mazier [24] reported good results in 90% of patients who had a V–Y anoplasty for anal stenosis.

The preparation of the flap is a crucial step of the operative technique; it should be well mobilized to reduce tension and, at the same time, to provide enough blood supply[35].

The flap procedures are associated with their own specific complications including postoperative wound infections, dehiscence with subsequent healing by secondary intention, flap seroma, haematoma, and nerve and muscle injury. The flaps require special care with a relevant length of hospital stay of several days.

We have achieved excellent results with only two complications; one patient, in our early experience, developed a partial breakdown of the suture line which was treated conservatively and one patient had a recurrence of stenosis requiring a second procedure 8 months after the first anoplasty. Two patients had Surgical-site infection that treated conservatively.

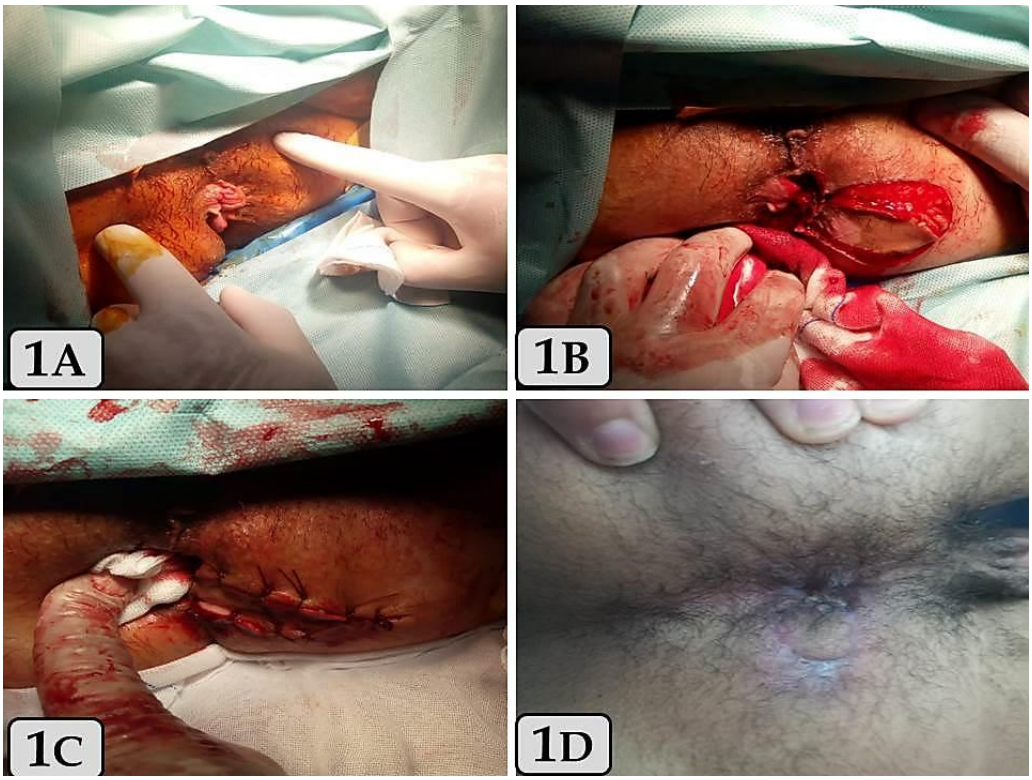

Fig 1A. Fourth degree piles with the patient in lithotomy position under anaesthesia. Fig 2A. V shaped incision was done after open haemorrhoidectomy. Fig 3A. V-Y anoplasty wound closure. Fig 4A. Wound healing 2 months postoperative.

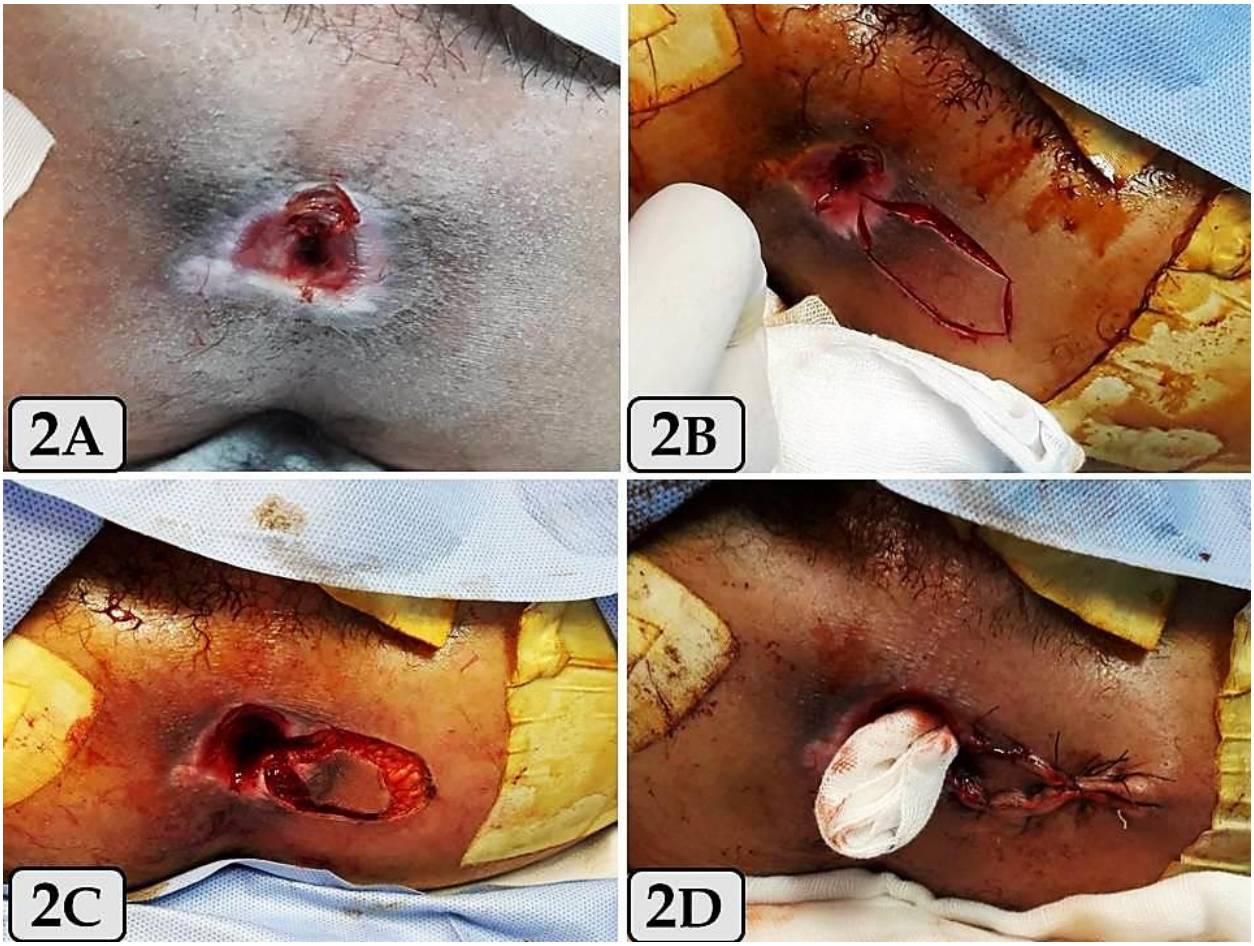

Fig1B. Post haemorrhoidectomy anal stenosis. Fig 2B. V shaped incision of V-Y anoplasty was done.
Fig 3B. Mobilization of the flap with preserving blood supply. Fig 4 B. V-Y anoplasty wound closure.

Conclusion:-

Our data suggest that despite the extensive destruction of anoderm occurring during excision of large haemorrhoids, the wound healing is fairly un-problematic ,when simultaneous V-Y advancement flap anoplasty, and the risk of developing anal stenosis is in fact very small. Anal stenosis is most often a preventable complication and a well-performed hemorrhoidectomy is the best preventative measure.

Conflict of Interests

The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this paper.

Abbreviations

Visual Analogue pain Scale (VAS).

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