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Case Series

Surgical management of post hemorrhoidectomy benign anal stenosis - an experience of eleven patients

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ABSTRACT

Anal stenosis is a serious but fortunately rare complication of anorectal surgical procedures. It has been shown that approximately 90% of anal stenosis develops after hemorrhoidectomy, and 1.5-3.8% of all hemorrhoidectomies. The surgical methods such as stricture release, sphincterotomy and advancement flap are common techniques to repair anal stenosis. This is a retrospective observational study of 11 patients with benign anal stenosis managed surgically from January 2017 to April 2022. A total of 11 patients (nine males and two females), mean age 45.6 years (range- 33-90 years), underwent various surgical procedures like partial lateral internal sphincterotomy (PLIS) (n=04), V-Y flap anoplasty (n=03) and diamond flap anoplasty (n=04) with PLIS in both types of anoplasties as an associated procedure. After follow up period of two months to three years, all patients of PLIS had 100% healing rate, V-Y flap anoplasty had 66% healing rate with re-stenosis in one patient and diamond flap anoplasty had 100% healing rate with no restenosis. In moderate to severe anal stenosis and failed conservative management, various anoplasty techniques can be used with lateral sphincterotomy with good results, especially diamond flap anoplasty.

Keywords: Benign anal stenosis, Hemorrhoidectomy, Diamond flap anoplasty

INTRODUCTION

Anal stenosis is a serious but fortunately rare complication of anorectal surgical procedures.[1] The overall incidence of anal stenosis is reported about 5%.[2] It has been shown that approximately 90% of anal stenosis develops after hemorrhoidectomy, and 1.5-3.8% of all hemorrhoidectomies.[3-6]

It occurs particularly in patients in whom 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.[7] The diagnosis can be made by rectal examination visualizing scar tissue and extension of stenosis, localized or circumferential.[2]

Several techniques have been described for the treatment of moderate to severe anal stenosis refractory to non-operative management.[7] The surgical methods such as stricture release, sphincterotomy and advancement flap are common techniques. Performing partial lateral internal sphincterotomy (PLIS) with anoplasty at the same time has been a debatable issue to prevent incontinence versus non-healing of wound.[8]

The aim of anoplasty is to restore normal function of anus by dividing the stricture and as a result widening the anal canal, thus decreasing the symptoms.[9,10] In this study, we evaluated results of surgical procedures in reference to healing rate and recurrence in management of moderate to severe anal stenosis due to a previous hemorrhoidectomy and other procedures over anal region.

CASE SERIES

This is a retrospective observational study of 11 patients with benign anal stenosis managed by various surgical procedures from January 2017 to April 2022. The data regarding demography, medical history, clinical presentation, investigations, treatment and follow up was analyzed from information entered in case records. Inclusion criteria consisted of patients who had moderate to severe anal stenosis with failure of conservative treatment. Exclusion criteria were inflammatory bowel disease, tuberculosis, previous radiotherapy and previous anal malignancy as etiologies for anal strictures.

Patient information

A total of 11 patients (nine males and two females), mean age 45.6 years (range- 33-90 years), underwent various surgical procedures like partial lateral internal sphincterotomy (PLIS) (n=04), V-Y advancement anoplasty (n=03) and diamond advancement anoplasty (n=04) with partial lateral internal sphincterotomy in both types of advancement anoplasties as an associated procedure.

Presentation

Preoperative symptoms included anal pain in all patients (100%), bleeding per rectum in two patients (18.1%) and no itching or incontinence in any patient. All of our patients complained of constipation and painful defecation (100%). According to the classification proposed by Milson and Mazier, seven patients (63.6%) had moderate and four (36.3%) patients had severe anal stenosis; the involvement of circumference of anal canal with stricture was <50% in six patients (54.5%) and >50% in five patients (45.4%).[11] In all patients, digital examination was not possible due to tight stenosis amenable to allow even a little finger. Total 10 patients (90.9%) had history of hemorrhoidectomy by various methods like in eight patients Milligan-Morgan, in one patient Ligasure™, and Ligation of external piles by quack in one patient. One patient presented with recurrent anal stenosis after diamond advancement flap done at other centre for anal stenosis on left side following hemorrhoidectomy. The time elapsed from hemorrhoidectomy to anoplasty varied from 1.5 months to 10 years (mean-16.77 months). None of the patients who had a previous hemorrhoidectomy was operated at our centre.

Pre-operative evaluation and preparations

Patients were evaluated preoperatively with basic blood investigations and radiological investigations like chest x-ray and screening ultrasonography of abdomen. Preoperative mechanical bowel preparation was done the day before surgery with prophylactic single dose of antibiotic at the time of induction and all operations were conducted under spinal anaesthesia in the lithotomy position. After completion of surgery, final caliber of anal canal was tested by moderate to large size proctoscope to ensure that it could be easily passed through the anal canal.

Operative procedures

It is represented in Figure 1.

V-Y flap anoplasty (n=03)

After anal dilatation with a medium Hill-Ferguson retractor, the initial V shaped incision including the area of stricture from dentate line to anoderm was made. The strictured area was excised and V shaped flap was created distally with skin and underlying subcutaneous tissue with vascular pedicle and wide mobilization to maintain flap viability keeping base towards dentate line and angle of 'V' towards anoderm. The base of the triangular 'V' flap is sutured to the dentate line with absorbable sutures. The skin is then closed with interrupted stiches behind the 'V' at the external portion of the perineum to push the 'V' into the anal canal and widen the stenotic area and creating final 'Y' shape. This flap can be done in the posterior midline or in either lateral position.[10] It can also be done bilaterally if needed to relieve the stenosis.

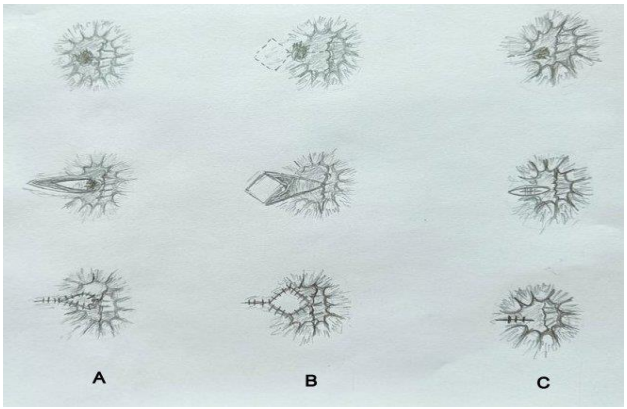

Figure 1: (A) V-Y flap anoplasty, (B) diamond flap anoplasty, and (C) partial lateral internal sphincterotomy (PLIS).

Diamond flap anoplasty (n=04)

It is represented in Figures 2 and 3.

After anal dilatation with a medium Hill-Ferguson retractor, fibrotic stricture was incised up to dentate line. A diamond shape defect equivalent to diamond flap was made by excising the scar tissue of the stricture at lateral aspect of lower anal canal and anal verge. Incision was made to make the diamond flap adjacent and lateral to created defect. Incision was deepened through subcutaneous tissue. Flap was created with wide pedicle so that its blood supply was not jeopardized after mobilization. Good mobilization of skin and subcutaneous fat of the flap was performed to ensure suturing to the defect without tension. Mobilized flap was then sutured to the defect without tension with absorbable sutures.

Resultant lateral defect was closed with absorbable sutures.

Figure 2: Diamond flap anoplasty.

Figure 3: Diamond flap anoplasty- after complete healing.

Partial lateral internal sphincterotomy (PLIS)

It was an associated procedure in both types of advancement flap anoplasties. Isolated partial lateral internal sphincterotomy at strictured site were performed in 04 patients. All isolated internal sphincterotomy were done with closed method, perianal skin was closed with two or three interrupted stiches with absorbable suture.

Postoperative care and follow up

In the post-operative period, a constipating regimen is recommended for two days with fiber supplements; oral antibiotic and analgesic therapy was continued for 7 days. Sitz baths was also instituted to assist with local hygiene. All patients were examined at one, two and seven days post operatively for any early complications and assessment of pain by using visual analogue scale (VAS) (from 0-10). The outcome of the procedure were evaluated after three and six months in reference to complete healing and recurrences. Healing rate was counted after complete healing of wound (healed by primary, secondary or tertiary intension) with healthy scar without any stricture formation.

RESULTS

Results were considered good (successful outcome) when spontaneous evacuation following high-fiber meals or bulk laxatives was observed; and unsatisfactory (unsuccessful outcome) when patients reported frequent painful evacuation for whom oral osmotic laxatives, suppositories, or enema administration were required and for those who required a late reoperation.[1] No patients complained prolonged (not more than two days) postoperative pain. No flap loss or flap displacement occurred within seven days postoperatively. One patient of V-Y anoplasty and one patient of diamond flap anoplasty developed early wound infection and dehiscence but managed with regular dressing followed by secondary suturing in diamond flap anoplasty and healing by secondary intension in patient of V-Y anoplasty.

At three and six months of postoperative follow up improved defecation, no pain at defecation and no per rectal bleeding were reported. Only one patient operated upon with V-Y anoplasty developed mild restenosis after three months of surgery but relieved by dilatations with mechanical dilators within one week. All patients expressed overall satisfaction and improved quality of life. The mean time until complete wound healing was 4.54 weeks, varying from three to eight weeks. After follow up of two months to three years, all patients of PLIS had 100% healing rate, V-Y anoplasty had 66% healing rate with one stricture recurrence and diamond anoplasty had 100% healing rate with no recurrence.

DISCUSSION

Benign anal stenosis is an incapacitating disease resulting after surgeries of the anal canal and rectum. Excising inadvertently large areas of rectal mucosa and anoderm especially without mucocutaneous bridges results in scarring and stenosis.[7] The ideal management of this condition is still to be identified, with trial and error of a lot procedures.[12] Etiological factors for anal stenosis are surgery of the anal canal, trauma over perianal region, inflammatory bowel disease, radiation therapy for pelvic malignancies, venereal disease like gonorrhea and lymphogranuloma, AIDS, infectious diseases like tuberculosis, actinomycosis and amoebiasis, Bowen's disease, Paget's disease, anal leukoplakia, chronic laxative abuse, congenital anorectal anomalies.[13,14] Ninety percent of anal stenosis is caused by overzealous hemorrhoidectomy, particularly after "whitehead hemorrhoidectomy" also called as Whitehead deformity.[3,15-17] Usually time elapsed from hemorrhoidectomy to anoplasty varied from 2 months to 15 years.[1] Although incidence of anal stenosis is lowered with refined techniques of hemorrhoidectomy like Milligan-Morgan method, still it is reported from 1.2% to 10% of all hemorrhoidectomies.[18] With today's technological evolution, there are alternative techniques such as Doppler guided hemorrhoidal artery ligation and stapled hemorrhoidopexy in place of excisional

hemorrhoidectomy with rate of anal stenosis as low as 0.8%.[2,7] Overzealous use of technological advancement like Ligasure™, Ultrasonic dissector and laser are also proven to be culprit in development of anal stenosis.[2] If anorectal surgical procedures are performed with technical acumen, the feared complications associated with surgical procedures, such as for anal stricture and sphincteric injuries, can be largely reduced.[7]

In our study, we included all patients of moderate to severe anal stenosis after procedural treatment of hemorrhoidectomy such as hemorrhoidectomy done by qualified surgeons and ligation of external piles by quacks. Those patients treated by quacks usually present with local sepsis initially managed conservatively and later develop anal stenosis.

Anal stenosis is classified differently using criteria like severity, shape or level of anal canal in relation to dentate line. [7]

On the basis of severity, Milsom and Mazier classification

Mild - tight anal canal can be examined by a well-lubricated index finger or a medium Hill-Ferguson retractor, moderate- forceful dilatation is required to insert either the index finger or a medium Hill-Ferguson retractor, and severe anal stenosis - neither the little finger nor a small Hill-Ferguson retractor can be inserted unless a forceful dilatation is employed.[11]

On the basis of shape of strictured anal canal

Diaphragmatic- characterized by a thin strip of constrictor tissue as after inflammatory bowel disease, ring like or annular- length less than 2 cm, after surgical or traumatic lesions, and tubular- length more than 2 cm.

On the basis of the anal canal levels

Low stenosis - distal anal canal at least 0.5 cm below the dentate line, 65% of patients, middle stenosis - 0.5 cm proximal to 0.5 cm distal to the dentate line, 18.5%, high stenosis- proximal to 0.5 cm above the dentate line, 8.5%, and diffuse stenosis- whole anal canal, 6.5% of cases.

Non-operative treatment is recommended for mild stenosis and for initial care of moderate stenosis. To achieve gradual natural dilation by using stool softeners and fiber supplements is the basis of non-operative treatment.[11] Gradual anal dilatation is another important part of this treatment. Anal dilation can be performed daily both digitally or with any of a number of graduated mechanical dilators. But mechanical injury and later stricture from the use of dilators may itself require surgical intervention.[19] However, a long course of conservative management is indicated in the treatment of mild anal stenosis before resorting to a surgical approach. If stenosis is refractory to non-operative management, surgery is the last solution. Moderate stenosis is initially treated in the same fashion as mild stenosis, but PLIS may be quite adequate as minimal surgical intervention. However, when fibrosis is intense, it might be an obstacle to the physiologic as well as mechanical anal dilation and insufficiency of PLIS, the interposition of normal tissue is required in form of advancement flap procedures.[1]

For moderate anal stenosis, our choice of procedure was isolated PLIS in four patients with 100% healing rate without recurrence at three years of follow up. PLIS was incorporated in all patients of advancement flap without any incidence of incontinence, the feared complication associated with this procedure. The benefits of PLIS with anoplasty are - more space for dilatation, decreased post-operative discomfort, and low failure rate.[20] As indicated by Nelson et al, the overall risk of incontinence (transient or permanent) after sphincterotomy is about 10%, mostly to flatus.[21,22] Although for moderate stenosis our preference still remains with only partial lateral internal sphincterotomy.

For more severe anal stenosis, a formal anoplasty should be performed to treat the loss of anal canal tissue. Several flap techniques have been described, and they can mainly be classified as advancement, island (adjacent tissue transfer), or rotational flaps.[2] These techniques for severe anal stenosis allow delivery of the more pliable anoderm into the anal canal to replace the scarred lining at that level. Various procedures of anoplasty like lateral mucosal advancement flap, Y-V flap anoplasty, V-Y flap anoplasty, diamond-shaped flap, house flap, U flap, C flap, rotational S-flap, internal pudendal flap anoplasty, foreskin anoplasty, Sarner's anoplasty and Musiari's anoplasty are described in literature and practiced worldwide.[1] The results of diamond flap, house flap, and island flap have been reported excellent in the literature.[7] The type of flap to be used is based on the surgeon's familiarity and choice as well as the patient's anatomy and the availability of adequate perianal skin for use in the various flaps.

We used V-Y flap anoplasty initially for severe anal stenosis with 66% healing rate with early restenosis in one case which was finally treated with mechanical dilatation with dilators for one week. Except wound dehiscence in a single early case, we experienced excellent result of diamond anoplasty. The diamond anoplasty is designed so that it will cover the intra-anal portion of the defect.[12] It was first described by Caplin and Kodner in 1986.[2] The flap is mobilized with minimal undermining to preserve the integrity of the subcutaneous vascular pedicle whereas in V-Y flap anoplasty the tip of the V is subject to ischemic necrosis from lack of mobilization, tension of the flap or loss of vascularization.[12] The low complication rate and high patient's satisfaction were comparable to other studies and reflects the easiness and effectiveness of the technique. From above discussion diamond flap anoplasty seemed to be more effective measure than other available procedure for correction of severe low variety anal stenosis. On the basis of stenosis severity, one or two flaps

can be created. Once the flap is fully mobilized, it can be advanced into the anal canal and sutured in place with interrupted absorbable sutures. These flaps can be done in any location and can be done bilaterally if needed.

On reviewing the literature, we found consistent healing rate nearly 100% for diamond flap anoplasty in severe anal stenosis as compare to other varieties of flap anoplasty. Oh and Zinberg used C anoplasty with healing rate 91% (n=12); Khubchandani published a study of mucosal advancement flap with healing rate of 94% (n=53); Caplin et al reported healing rate of 100% for diamond flap (n=23); Pidala et al done study of island flap anoplasty (n=28) with healing rate of 91%; Aitola and co-workers reported healing rate of 60% in Y-V plasty (n=10); in a study by Maria et al, out of total cases of 42, healing rate in Y-V plasty was 90% (n=29) and in diamond flap 100% (n=13) (Brisinda).[23-28] Gallo et al in a study between January 2002 and September 2017, over 50 consecutive patients with moderate and severe anal stenosis performed rhomboid flap anoplasty with complete improvement in 96% of patients.[29] Merter Gulen et al conducted a study on 18 patients with severe anal stenosis with clinical success rate of 88.9% in diamond flap anoplasty.[30]

Our results are consistent with studies mentioned above but with limiting factors like small sample size and short term follow up period. Unilateral diamond flap anoplasty with partial lateral internal sphincterotomy succeeded in providing pain-free defecation and complete patient satisfaction in all of patients (healing rate 100% in diamond flap anoplasty as well as PLIS and 66.6% in V-Y flap anoplasty). The recurrent symptoms can be corrected by operating the other side in the same manner. Post-operative complications can be easily controlled conservatively. The most critical issue of these procedures, that is, the flap preparation on a wide base and avoiding suturing over tension, must be adhered.[12]

Complications can be severe anal pain, bleeding, local sepsis, wound dehiscence, failure to correct the stenosis, donor site problems, pruirtis, urinary or feacal incontinence, urinary tract infection; flap necrosis from ischemia or local sepsis, ischemic contracture of the edge of the flap, constipation without stenosis, restenosis and ectropion if the flap is advanced too far and sutured at the anal verge.[7] In our study we didn't encounter any flap necrosis but there was wound dehiscence in both types of advancement anoplasty and early re-stenosis in V-Y plasty that was corrected by diamond flap anoplasty ultimately. Although 11 patients in three years duration is suggestive of very small sample size, but considering uncommonness of this pathology and reviewing the literature, our experience is worth to mention for this annoying condition.

CONCLUSION

Anal stenosis is a preventable condition with cautiously performed anorectal surgery especially hemorrhoidectomy. In patients of moderate to severe anal stenosis and patients with failed conservative management, various anoplasty techniques can be used with lateral sphincterotomy with good results, especially diamond flap anoplasty. A simple procedure like partial lateral internal sphincterotomy yields satisfactory result in moderate grade anal stenosis. Surgeon's choice and expertise as well as experience are crucial factors in determining success of anoplasty.

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