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Diamond Flap Anoplasty for Severe Post – Hemorrhoidectomy Anal Stenosis: A Case Report

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ABSTRACT

Background: Anal stenosis is an uncommon but clinically significant complication of anorectal surgery, most frequently occurring after hemorrhoidectomy. While mild cases may be managed conservatively, severe stenosis typically fails to respond to non-surgical interventions and requires operative correction. A variety of reconstructive techniques have been described in the literature. In routine surgical practice, the diamond flap has emerged as a reliable and practical option, offering effective anal canal expansion while preserving sphincter function and ensuring optimal tissue perfusion.

Objective: This case report describes a patient with severe anal stenosis developing after hemorrhoidectomy who was successfully treated with diamond flap anoplasty. The report highlights the clinical presentation, surgical management, and postoperative outcome.

Methods: We report the case of a 60-year-old man with a history of hemorrhoidectomy performed approximately 20 years earlier, who presented with long-standing symptoms of obstructive defecation. After conservative management failed, surgical treatment was undertaken using a diamond-shaped mucocutaneous flap for scar excision, reconstruction of the anal canal, and limited internal sphincter release.

Conclusions: Diamond flap anoplasty is an effective surgical approach for the management of severe anal stenosis following hemorrhoidectomy. In this patient, the procedure achieved adequate widening of the anal canal while preserving sphincter integrity, resulting in marked symptomatic improvement. Awareness of anal stenosis as a potential late complication of hemorrhoidectomy is essential, as early recognition facilitates appropriate selection of reconstructive techniques and optimizes functional outcomes. This case demonstrates that, with careful flap design and meticulous surgical technique, diamond flap anoplasty can provide durable anatomical restoration and meaningful clinical benefit in patients with advanced cicatricial anal stenosis.

1. BACKGROUND

Anal stenosis is an uncommon but clinically significant condition characterized by pathological narrowing of the anal canal. It may lead to obstructive defecation, pain, bleeding, and a marked deterioration in quality of life. Although anal stenosis may result from inflammatory, traumatic, or malignant conditions, the most common cause in contemporary surgical practice is iatrogenic injury following anorectal surgery, particularly hemorrhoidectomy [2,3,16,17]. It most often develops as a consequence of excessive excision of the anoderm and distal rectal mucosa, leading to circumferential scarring, loss of tissue elasticity, and progressive narrowing of the anal canal [3,16,18].

The reported incidence of anal stenosis after hemorrhoidectomy is relatively low; however, its clinical impact can be substantial, especially in patients who do not respond to conservative measures and ultimately require surgical reconstruction [13,17]. Identified risk factors include overly aggressive surgical techniques, circumferential tissue excision, postoperative infection, and impaired wound healing, all of which contribute to fibrotic remodeling of the anal canal [3,17]. Symptoms typically develop insidiously and may manifest many years after the initial operation, underscoring the potential for delayed presentation, as observed in the present case [13,16].

Clinically, anal stenosis is commonly classified as mild, moderate, or severe based on symptom severity and findings on physical examination [2]. Mild cases are generally managed conservatively with dietary modification, stool softeners, topical agents, and gradual anal dilatation. In contrast, moderate to severe stenosis—particularly when digital rectal examination cannot be performed—reflects significant anatomical compromise and usually necessitates surgical intervention [2,4,10,18]. Prolonged conservative treatment in such cases is unlikely to yield sustained improvement and may prolong patient discomfort and functional limitation [4,10].

The goal of surgical management is to restore the caliber and compliance of the anal canal while preserving sphincter function and continence. Over recent decades, a variety of reconstructive approaches have been described, including lateral internal sphincterotomy in selected cases, mucosal advancement techniques, and multiple cutaneous or mucocutaneous flap anoplasties [5–7,10,19]. In patients with severe cicatricial anal stenosis, flap-based reconstruction is frequently preferred, as it allows excision of fibrotic tissue and replacement with healthy, well-vascularized tissue, thereby reducing the risk of restenosis [10,18]. The most commonly reported techniques include Y–V anoplasty, house flap, rhomboid flap, and diamond flap anoplasty [5,6,7,12,20].

Although numerous studies have demonstrated favorable outcomes with different flap designs, no single technique has been universally accepted as superior. Outcomes appear to depend largely on appropriate patient selection, the characteristics of the stenosis, and surgical expertise [10,18,22]. In cases of severe post-hemorrhoidectomy anal stenosis, the diamond flap is often favored because its configuration provides a broad, well-vascularized base that facilitates reliable, tension-free enlargement of the anal canal [1,6,21]. Given the potentially disabling nature of symptoms and the technical complexity of surgical correction, early recognition of this complication and familiarity with available reconstructive options are essential for achieving optimal functional outcomes. The present case illustrates a severe, late-onset presentation of anal stenosis successfully treated with diamond flap anoplasty and offers an opportunity to review this technique in light of current evidence.

2. OBJECTIVE

This article presents a case of severe anal stenosis following hemorrhoidectomy that was managed with diamond flap anoplasty. The report emphasizes the diagnostic evaluation, operative technique, and

postoperative outcome, and discusses this reconstructive approach within the context of the current literature.

3. CASE PRESENTATION

A 60-year-old man presented with a long-standing history of obstructive defecation symptoms that had gradually progressed over several years. He reported infrequent bowel movements occurring every few days, significant straining during defecation, and passage of narrow, ribbon-like stools. Regular use of laxatives provided minimal relief, and he frequently experienced a sensation of incomplete evacuation. His surgical history was notable for an open hemorrhoidectomy performed approximately 20 years earlier. There was no clinical history suggestive of inflammatory bowel disease, pelvic radiotherapy, or anorectal malignancy.

Physical examination revealed a markedly narrowed anal canal with dense, circumferential fibrosis at the anal verge, precluding digital rectal examination and consistent with severe cicatricial anal stenosis. In view of the severity of symptoms and failure of conservative management, surgical intervention was indicated.

The procedure was performed under general anesthesia with the patient in the lithotomy position. Following adequate exposure and preparation of the operative field, careful preoperative planning of the reconstruction was undertaken. A diamond-shaped mucocutaneous flap was designed and marked adjacent to the stenotic anal canal to ensure appropriate dimensions and preservation of a reliable vascular pedicle (Figure 1).

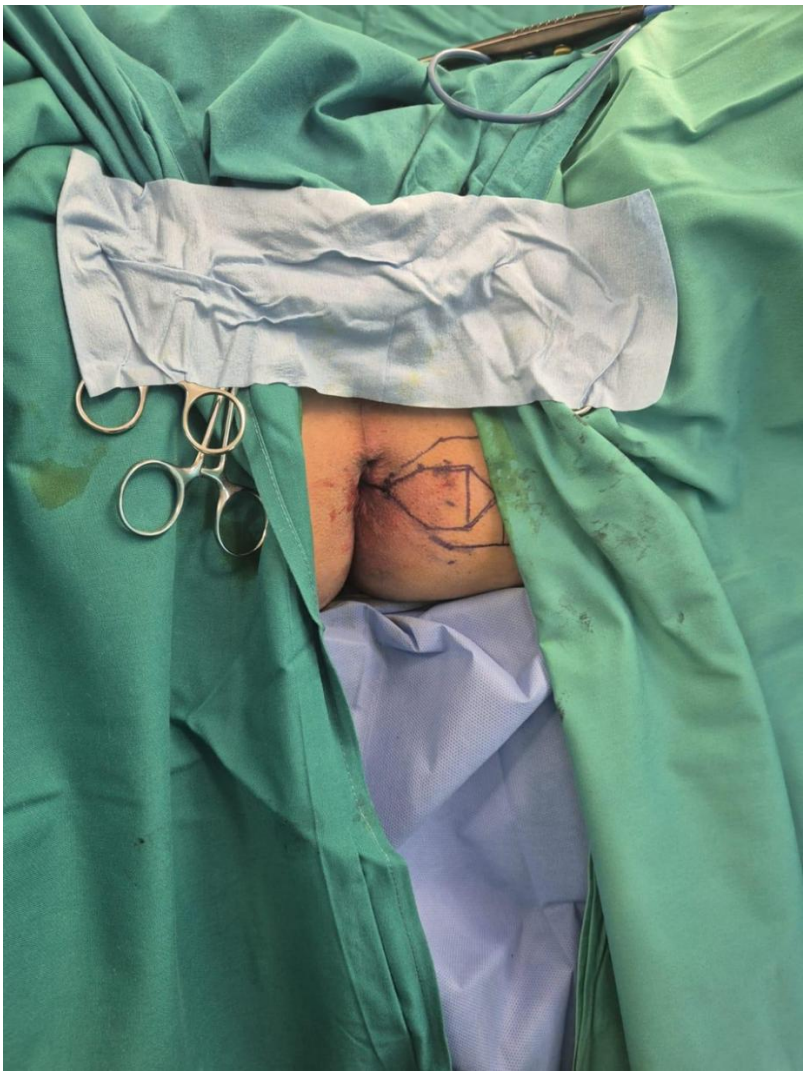

Figure 1. Pre-incision intraoperative view illustrating marking and planning of the diamond-shaped mucocutaneous flap adjacent to the stenotic anal canal.

Incisions were made along the pre-marked flap margins, followed by meticulous dissection through the subcutaneous tissue (Figure 2). Dense fibrotic scar tissue responsible for the circumferential narrowing of the anal canal was identified and progressively excised. A limited release of the constricting fibrotic ring, including superficial fibers of the external sphincter, was performed with particular attention to preserving sphincter integrity and function (Figure 3).

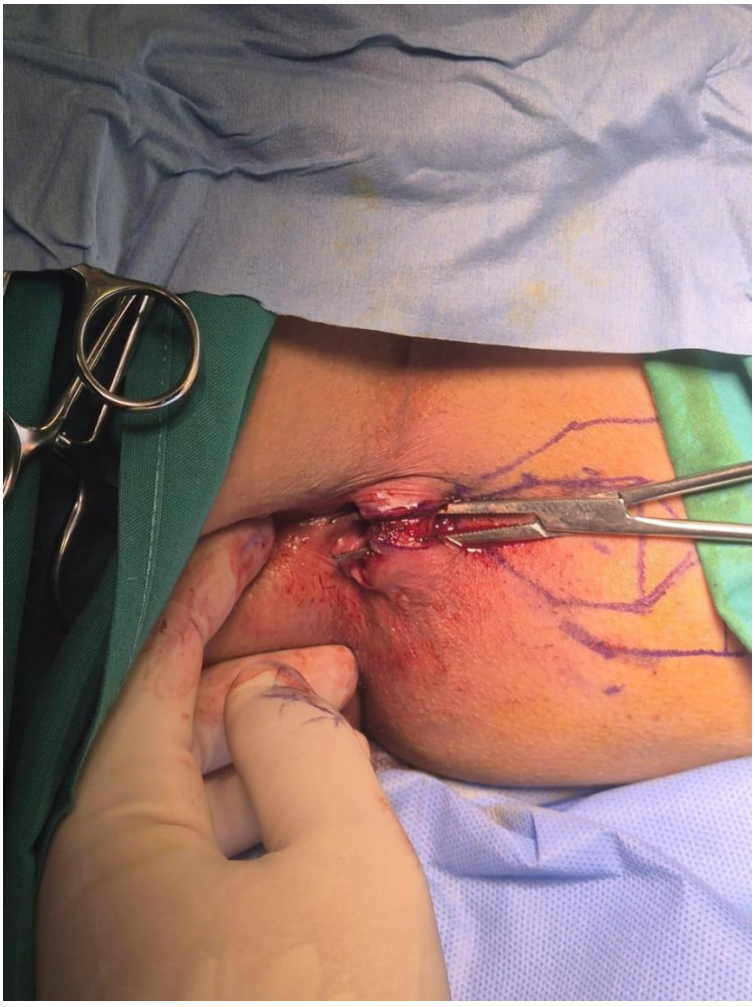

Figure 2. Intraoperative view showing the initial incision along the pre-marked diamond-shaped mucocutaneous flap.

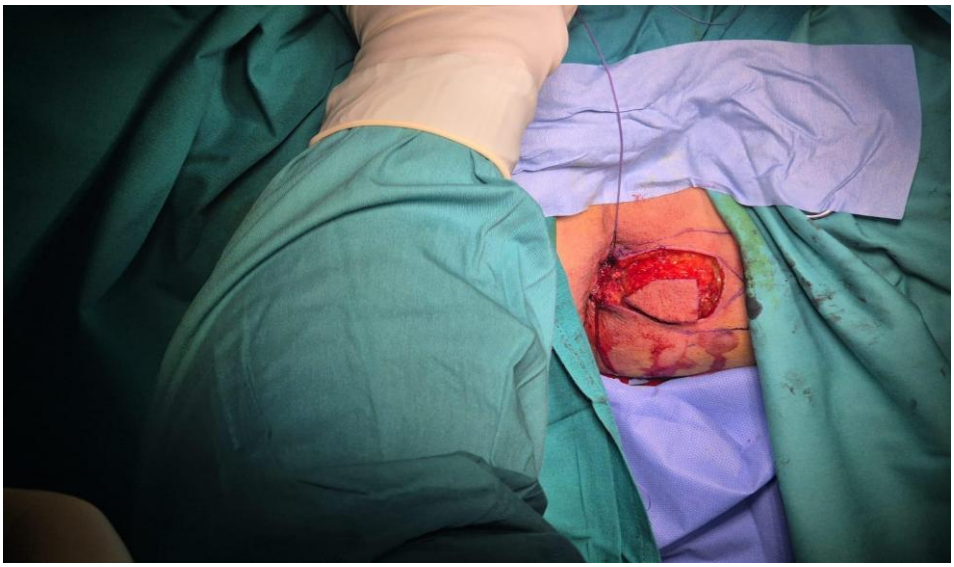

Figure 3. Intraoperative view after complete excision of fibrotic tissue, revealing a wide anal canal defect before flap advancement.

After complete excision of the scar tissue, a sizable defect within the anal canal became evident, underscoring the severity of the stenosis and confirming the need for reconstructive anoplasty (Figure 4). The diamond-shaped flap was then mobilized on its vascular pedicle and advanced into the defect. Adequate perfusion was carefully assessed, and the flap was positioned without tension before fixation (Figure 5). Interrupted absorbable sutures were used to secure the flap, resulting in immediate widening of the anal canal. Intraoperative digital examination confirmed satisfactory enlargement and improved tissue compliance. The final operative appearance demonstrated a well-perfused flap with restoration of normal anal caliber.

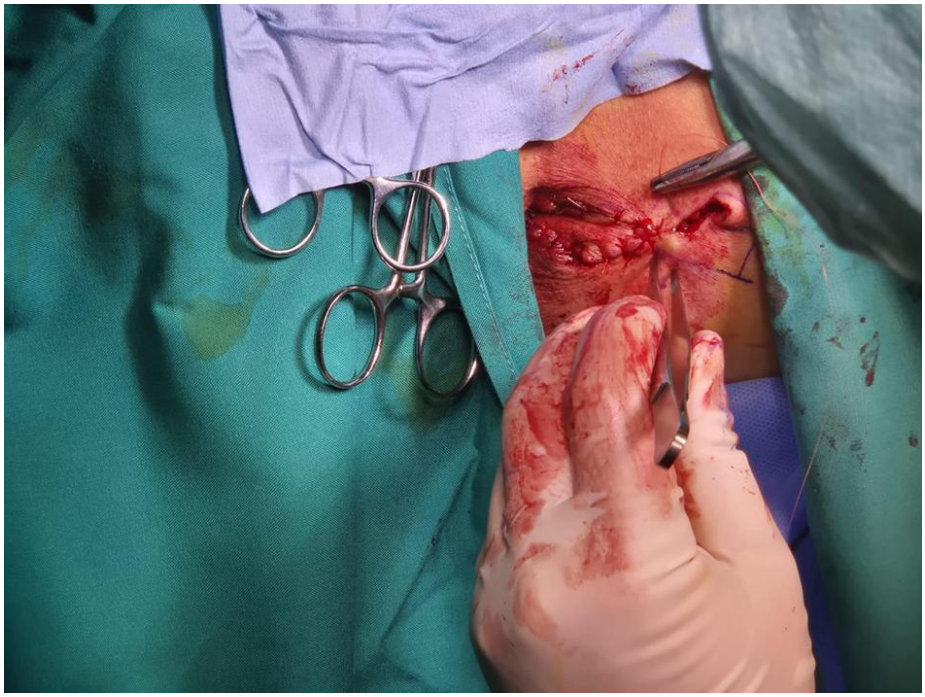

Figure 4. Intraoperative image showing excision of dense cicatricial tissue causing circumferential anal stenosis.

Figure 5. Final intraoperative view after diamond flap anoplasty, showing the advanced mucocutaneous flap sutured in a tension-free manner with adequate widening of the anal canal and good flap perfusion.

The postoperative course was uneventful. The patient reported significant improvement in bowel habits, normalization of stool caliber, and complete resolution of obstructive symptoms. Follow-up examination showed appropriate wound healing, preserved perianal anatomy, normal sphincter tone, and no evidence of wound-related complications or restenosis (Figure 6).

Figure 6. Postoperative follow-up view demonstrating satisfactory wound healing, preserved perianal anatomy, and restored anal canal caliber.

4. DISCUSSION

Post-hemorrhoidectomy anal stenosis is a relatively rare but clinically significant complication that can lead to severe functional limitations and a substantial reduction in quality of life. In most instances, this condition is iatrogenic, resulting from excessive excision of anoderm and distal rectal mucosa during the hemorrhoidectomy procedure, followed by circumferential scarring and progressive contracture of the anal canal [3,16,17]. Despite its low reported incidence, the functional repercussions can be considerable, particularly in severe cases where the anal canal becomes rigid and critically narrowed [2,13,17].

Patients typically present with symptoms of obstructed defecation, such as pronounced straining, pain during bowel movements, and the passage of narrow, ribbon-like stools [2,8]. As the condition progresses, the severity of these symptoms often increases, and in many instances, performing a digital rectal examination becomes difficult due to marked anatomical narrowing. In such cases, surgical intervention is often more appropriate than continued conservative management [2,4,10]. While dietary adjustments, stool softeners, topical therapies, and gradual dilation may be beneficial for mild stenosis, these treatments tend to become ineffective once dense cicatricial fibrosis has developed, often prolonging patient discomfort without providing lasting relief [2,4,10,18].

Surgical management generally focuses on the adequate release or excision of scar tissue, followed by reconstruction with healthy, well-vascularized tissue to restore the anal canal's caliber and elasticity while preserving continence [10,11]. A variety of reconstructive techniques have been described over time,

including lateral internal sphincterotomy in select cases, mucosal advancement procedures, and various cutaneous or mucocutaneous flap anoplasties [5–7,10,19]. The choice of the most appropriate technique should be individualized, taking into account the extent and level of stenosis, local tissue characteristics, and the surgeon's experience [10,18].

Among flap-based techniques, Y–V anoplasty, house flap, and rhomboid or diamond-shaped flaps are most commonly reported in the literature [5,6,7,12,20]. Both Y–V and diamond-shaped pedicle flaps have demonstrated favorable functional outcomes when applied appropriately, particularly when combined with meticulous scar excision and selective sphincter release [20,21]. The house flap remains a viable option, particularly for longer strictures, due to its ability to advance pliable perianal skin while maintaining a reliable blood supply [19]. Comparative studies, including a prospective randomized trial, have shown symptomatic improvement with different flap techniques, supporting flap-based reconstruction as an effective strategy. These studies also emphasize the importance of tailoring the technique to the specific characteristics of the stenosis [22].

In cases of severe cicatricial anal stenosis, diamond flap anoplasty is often preferred due to its practical advantages. The flap's design allows for significant tissue advancement while maintaining a stable base, ensuring steady blood flow and minimizing tension on the suture line. This is particularly critical in advanced cases, where tension at the repair site can lead to wound complications or recurrence of narrowing [6,21]. Another advantage of this technique is its flexibility in reconstruction, allowing for a tailored approach to achieve an appropriate anal canal diameter, which can lead to improved functional outcomes [6]. Clinical reports of patients treated with diamond flap anoplasty after hemorrhoidectomy have demonstrated good long-term results, provided that careful flap design and precise surgical techniques are employed [6].

While systematic reviews have highlighted differences in complication and recurrence rates among various anoplasty techniques, these findings underscore the importance of individualized surgical planning rather than dismissing any particular method [18]. In patients with severe post-hemorrhoidectomy stenosis, characterized by circumferential scarring and tight, pliable anoderm, diamond flap advancement remains a well-established and practical reconstructive option [6,10,21].

Preserving sphincter function is a key consideration in all types of anal stenosis surgery. Excessive sphincter division can result in incontinence, while insufficient release may lead to inadequate canal widening and potential recurrence [7,10]. In this case, careful excision of scar tissue, combined with a limited release of the constricting ring and diamond flap reconstruction, achieved satisfactory widening while maintaining continence. This approach aligns with the primary goals of anoplasty [10,21]. Postoperative care, including the management of stool consistency, pain control, and close monitoring of the wound, is also crucial in promoting healing and reducing the risk of restenosis [10,18]. Overall, this case demonstrates that diamond flap anoplasty is a reliable and effective option for treating severe anal stenosis following hemorrhoidectomy, particularly when attention is given to flap design, blood supply, and sphincter preservation [6,10,21].

5. CONCLUSION

Severe anal stenosis following hemorrhoidectomy is a rare but profoundly disabling condition that often requires surgical intervention. In these cases, diamond flap anoplasty provides a practical and effective reconstructive option, restoring anal canal patency while preserving sphincter function and ensuring adequate tissue perfusion. The present case illustrates that this technique can lead to reliable functional improvement in advanced cicatricial stenosis. Additionally, it underscores the importance of meticulous

surgical technique during the initial hemorrhoidectomy to minimize the risk of this challenging late complication.

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