Original Research Article

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Comparative study between excision with primary closure versus Limberg flap for treatment of primary sacrococcygeal pilonidal sinus

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ABSTRACT

Background: Surgical treatment of sacrococcygeal pilonidal sinus is associated with significant recurrence rate. However; recent studies suggested the use of rhomboid excision and Limberg flap repair as feasible procedure for treatment of pilonidal sinus disease. Our aim is to evaluate the role of rhomboid excision of the pilonidal sinus with Limberg flap by comparing this procedure with the traditional excision and primary closure.

Methods: This prospective study included 60 patients with sacrococcygeal pilonidal sinus. The patients were randomly divided into 2 equal groups. Rhomboid excision of the sinus with limberg flap was performed in 30 patients (group A), and excision of the sinus with primary closure was done to the other 30 cases (group B). Demographic data and surgical outcome were compared between both groups.

Results: Group A showed significant early return to work and significant less postoperative pain than group B (P=0.04 and P=0.02 respectively). Incidence of wound dehiscence, postoperative hematoma and seroma was less among group A but without significant difference. The incidence of postoperative infection and recurrence rate was significantly less in group A than group B (P=0.04 and P= 0.035 respectively).

Conclusion: Rhomboid excision and Limberg flap repair is an advantageous and effective modality than simple excision with primary closure in treatment of sacrococcygeal disease. In addition, it is safe and easily procedure; it may be an ideal treatment option in management of pilonidal sinus.

Keywords: Limberg flap, Sacrococcygeal pilonidal sinus

INTRODUCTION

Sacrococcygeal pilonidal sinus is a common chronic condition usually affecting adult males under 45 years.^{1,2} The pathogenesis of the disease may be congenital or acquired. Recent opinion has gained more acceptances with the acquired theory.³ Patients usually come with chronic infective discharge or acute attack of abscess. The chief symptoms are localized pain, swelling and seropurulant discharge.⁴ Due to the recurrent nature of the disease and its high morbidity, many surgical procedures have been described for treatment of both primary and

recurrent pilonidal disease.⁵ However, no single procedure has been widely accepted as the gold standard. These procedures include excision and healing by secondary intention, marsupialization, excision and primary closure and various types of excision followed by flap repair.⁶ In recent years, many studies reported various procedures of primary excision with flap repair (Rhomboid, V-Y advancement, Z-plasty and myocutaneous flaps).⁷⁻¹⁰ All these surgical modalities have been associated with variable rates of local infection, wound dehiscence, postoperative pain, and prolonged hospital stay and recurrence.⁶

Our aim in this study is to evaluate the role of rhomboid excision of the pilonidal sinus with limberg flap by comparing this procedure with the traditional excision and primary closure.

METHODS

This prospective study was carried out at Sohag University Hospital from October 2013 to March 2016. Sixty patients with primary sacrococcygeal pilonidal sinus subjected to two different treatment modalities, whether by rhomboid excision and Limberg flap procedure (group A) or by excision and primary closure (group B). All included patients were consented. Exclusion criteria in both groups included patients with recurrent disease, patients with systemic disease affecting wound healing, diabetes mellitus, presence of acute inflammation or associated with abscess formation.

All patients were admitted to hospital the day before operation. The intergluteal area was shaved before surgery. Prophylactic parenteral broad-spectrum antibiotics was given at the time of induction of anesthesia (Cefepime, 2 gram I.V). All patients were operated under spinal anesthesia. The patients were placed in prone position with lateral traction of the buttocks with wide adhesive tapes. Appropriate sterilization of the surgical area with povidone- iodine solution. Delineation of the course of the sinus was helped by injection of methylene blue (1-3cm) or introduction of blunt probe to avoid missing of excision of any side tracks.



Figure 1: Rhomboid incision around the sinus with mapping of the flap.



Figure 2: Dissection of the rhomboid flap from the gluteal area.



Figure 3: Rotation of the rhomboid flap to the raw area after excision.



Figure 4: Suturing of the flap with suction drain.



Figure 5: Post-operative figure during follow up visit on postoperative day 20 showing healthy healed flap.

In group A, a rhomboid-shaped incision was made around the sinus which was equal in length on each side from the mouth of the sinus. The incision was deepened extending to the presacral fascia. Rhomboid fasciocutaneous flap was divided and mobilized from the underlying gluteus muscle. The flap was sutured without tension in 3 layers (gluteal fascia with 2/0 polygalactin, subcutaneous fat with 3/0 polygalactin and lastly closure of the skin). Suction drain was put behind the flap and removed on the fifth to seventh postoperative day. The skin stitches were removed on the 14th postoperative day. In the case of wound infection or hematoma, the wound was drained by removed of few sutures with regular daily dressing and covered with broad spectrum antibiotics, (Figure 1-5).

In group B, a vertical elliptical incision around the sinus was done extending to the presacral fascia. The excision was at least 1cm away from the sinus. After making sure of good hemostasis, primary closure of the wound with application of a suction drain.

Follow up was done to all patients every 2 months during the first year and each 4 months later on, in regular outpatient's visits or by follow up phone calls. We used student's t- test to verify the comparative study between both groups and p < 0.05 was considered statistically significant.

RESULTS

The study included 60 patients with primary sacrococcygeal pilonidal sinus; the cases were randomly divided into 2 equal groups. Rhomboid excision of the sinus with Limberg flap was performed in 30 patients (group A), and excision of the sinus with primary closure was done to the other 30 cases (group B).

Demographic data and preoperative clinical findings were detected in both groups as shown in (Table 1). The main symptoms were pain and intermittent discharge in both groups.

Table 1: Demographic data and preoperative clinical findings in both groups.

	Group A (flap group)	Group B (primary repair group)
Number of patients	30	30
Age in year (mean± SD)	(18-42) 27.4±6.2	(19-44) 29.2±8.4
Sex(M/F)	28/2	27/3
Main complaint		
Pain	16 (53%)	15(50%)
Intermittent discharge	9 (30%)	11(37%)
Intermittent abscess formation	5 (17%)	4(13%)

The operative time was more in group A (Flap group), but without statistical difference in comparison with group B. There was significant statistical difference between both groups as regards, time to walk without pain and duration to return to work as shown in (Table 2). The postoperative surgical outcome was recorded and compared in both groups in (Table 2). The incidence of wound infection, wound dehiscence and subcutaneous hematoma was more among group (B). The wound infection was significantly increased among group B in comparison with group A. On the other hand, the incidence of wound dehiscence, subcutaneous hematoma and seroma was decreased in group A but without significant statistical difference.

Table 2: Operative findings and postoperative outcome.

	Group A	Group B	P-value
Operative time (minutes)	65.12±1.6	54.4±6.2	Ns
Hospital stay (mean days)	2.82±1.36	3.26±0.32	Ns
Time to wake without pain (days)	11.82±2.18	14.64±3.16	0.02*
Return to work (days)	18.62±3.48	22.26±2.43	0.04*
Postoperative complications			
Wound infection	2 (6.7%)	6 (20%)	0.04*
Wound dehiscence	1 (3.3%)	4 (13.3%)	Ns
Hematoma	1 (3.3%)	2 (6.7%)	Ns
Seroma	1 (3.3%)	2 (6.7%)	Ns
Recurrence	1 (3.3%)	6 (20%)	0.035*

During the follow up period which was ranged from 10 to 22 months with a mean 16 months, recurrence was detected in 6 patients among group B (20%) and 1 patient in group A (3.3%) with significant P-value = 0.035. No detectable mortalities during the follow up period.

DISCUSSION

Sacrococcygeal pilonidal disease is a common, disabling condition, frequently affecting the young working and student population, resulting in considerable morbidity and loss of work days.⁶ Pilonidal sinus consists of a symptom complex with clinical presentations ranging from asymptomatic pits to painful draining lesions.^{9,11}

In this literature, the demographic data of both groups showed that most of our patients were males with the mean age 27 and 29 years respectively, this was consistent with other many studies.¹²⁻¹⁶ Additionally, the main complaint of our patients was pain, intermittent discharge and intermittent abscess formation; this was in agreement with other related studies.^{4,11,13,17}

Successful surgical treatment of pilonidal disease requires wide excision of the sinus and underlying hair nests.¹⁸ Consequently, a full basket of surgical techniques varied from simple curette to extensive flap techniques have been published. The ideal procedure to eradicate the disease should eliminate the natal cleft so as to take off the anatomical predisposition for the recurrence of the sinus.¹⁹ Skin flaps to cover a sacral defect after wide excisions have been described that rhomboid flap technique involves creation of a flap to facilitate primary closure and to obliterate the deep natal cleft. Initially, the rhomboid flap procedure was indicated for complex and recurrent cases, but now it has been recommended as a first line management of chronic sacrococcygeal pilonidal sinuses.^{20,21}

In the present study, we managed 30 patients with wide surgical excision and closure of the defect with rhomboid flap and their surgical outcome was evaluated by comparing this flap procedure with a similar number of patients undergoing traditional method of surgical excision and primary closure of the pilonidal sinus.

Also, in this study, the operative time among the flap group (group A) is more than simple closure group (group B), but without significant statistical difference. This is parallel with other similar studies.^{15,16,19}

However, group (A) showed significant statistical difference in comparison with group B as regards; time to walk without pain, and time to return to work. These results agree with other related comparative studies.¹²⁻¹⁴

Furthermore, the early postoperative surgical outcome of our patients showed that the reported incidence of wound infection, wound dehiscence and formation of subcutaneous hematoma were less among the flap group series in comparison with the other group. Many other current studies documented similar reported results.^{12,14-16,19} Great number of studies used vacuum drains after rhomboid flap to abolish the dead space and to prevent complications such as hematoma, seroma and recurrence.^{14,16,22} In our study we used suction drains on both groups.

On the other hand, smaller number of studies reported that there was no significant difference between the use of drains or not on the surgical outcome.^{23,24}

The main causes of recurrence after surgical management of pilonidal sinus disease are the possible results of incomplete resection, postoperative dead space, excessive flap tension, chronic inflammation, trauma and the nature of body hairs and skin. Midline incision and deep intergluteal sulcus could particularly cause to the poor results.^{5,25}

During the follow up period, our results showed that recurrence occurred in one patient only in the flap group (3.3%) and in 6 patients among the primary closure group (20%) with significant P-value (0.035). These recorded results were close to the incidence of recurrence of other similar related studies.^{12,13,16,19,23,26}

CONCLUSION

Rhomboid excision and Limberg flap repair is an advantageous and effective modality than simple excision with primary closure in treatment of sacrococcygeal disease. In addition, it is safe and easily procedure; it may be an ideal treatment option in management of pilonidal sinus.

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