The Outcome of Limberg Flap Procedure in the Management of Primary Chronic Sacrococcygeal Pilonidal Sinus Disease

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Abstract

Introduction: Sacrococcygeal pilonidal sinus (PNS) is a common chronic benign disease of young age group**,** associated with morbidity, often with a prolong loss of normal activity. Still there is ongoing debate regarding the best treatment option as all the methods have complications, although; the current evidence supports the use of off- midline techniques because of lower recurrence rates and avoidance of all disadvantages of open treatment**.**This study was done to determine the postoperative outcome of rhomboid excision and Limberg flap reconstruction as a main procedure in the treatment of PNS disease in our institute.

Patients and Method: A prospective study conducted at the Department of General Surgery- Baquba Teaching Hospital- Diyala- Iraq, from January 2017 to June 2019, in which 98 patients (78 male and 20 female) with chronic primary sacrococcygeal PNS were enrolled. The age of the patients ranged between 16 – 38 years. Patients with acute abscess were first treated by incision and drainage before definite surgery. Patients were operated by rhomboid excision and Limberg flap reconstruction.

Results: In this study, 98 patients were enrolled, 78 male (79.59 %) and 20 female (20.4%) with male to female ratio of 3.9:1. The age of the patients ranged between 16 to 38 years with the mean age of 25 years. During the follow up period; 6 patients (6.12%) developed seroma, 4 patients (4.08%) had infection and 4 patients (4.08%) had recurrent sinus after few months and one patient (1.02%) had wound disruption.

Conclusion: Rhomboid excision and Limberg flap reconstruction of PNS diseaseis safe and reliable technique with low complication and recurrence rates if performed according to appropriate surgical principles.

Key words: *Pilonidal sinus, Limberg flap, postoperative complications.*

Introduction

Pilonidal sinus (PNS) is a common, benign disease[1-3] most frequently observed in the sacrococcygeal region[2], but also has been seen in the axilla, suprapubic area,periumbilical zone and between the fingers in the barbers[4]. The onset of PNS is rare both before puberty and after the age of 40 ,the disease is more common in male probably due to their more hersute nature [5-8],and more common in Caucasians than Asians and Africans due to differing hair characteristics and growth pattern [5].

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For unknown reasons, the incidence of PNS has increased continuously during the last few decades, particularly in European and North American young men (9) and now the incidence is estimated to be 26 per 100000 people [10].

The etiology of PNS is uncertain; the current concept is that it is acquired pathology with a combination of local forces and friction acting on the topography of the natal cleft leading to implantation of loose hair into the depth of natal crease with subsequent inflammatory reaction[1,10,11]. Obesity, local trauma, poor personal hygiene, narrowness of natal cleft and sweating with sitting and friction as in drivers and sedentary occupation are all risk factors for the development of the disease[8,12] .

Clinically, PNS can present as a cyst, acute abscess or chronic discharging sinus [13]all are associated with morbidity, often with a prolong loss of normal activity[14].Acute abscess should be drained, while chronic PNS should only be subjected to definite surgery[4,8,13] .

The ideal treatment for chronic PNS should ensure low pain, limited wound care, short hospitalisation period, low complication and recurrence rates and rapid return to normal activities[14-16] and the available options like excision alone, excision with primary closure, marsupialisation, excision with closure using various types of flaps (fasciocutaneous V-Y flap, Z- or W- plasty, rhomboid flap and gluteus maximum muscle myocutaneous flap)[8-13], all these methods have complications, postoperative infection and recurrence [17]. So there is no consensus as to the best method of management of this problem[18] and the choice of the surgical method primarily depends on the experience of the surgeon and on the content of the patient[7].

The Limberg flap (named after its early 20th century inventor Prof. AleksanderLimberg of Leningrad) is a rhomboid transposition flap and was first published as a treatment for PNS by Azabetal[19] then became the most common off- midline procedure used to treat sacrococcygeal PNS as this flap is safe and reliable technique with low complication and recurrence rates if performed according to appropriate surgical principles [1,4] .

This study was done to determine the postoperative outcome of rhomboid excision and Limberg flap reconstruction as a main procedure in the treatment of PNS disease in our institute.

Patients and Methods

A prospective study conducted at the Department of General Surgery- Baquba Teaching Hospital-Diyala- Iraq, from January 2017 to June 2019,in which 98 patients (78 male and 20 female) with chronic primary sacrococcygealPNS were enrolled. The age of the patients ranged between 16 – 38 years. Patients with acute abscess were first treated by incision and drainage before definite surgery.

The surgical treatment involved using the Limberg flap i.e after a rhomboid excision of diseased tissue down to presacral fascia, a rhomboid subcutaneous flap was mobolized and transposed to cover the defect with subsequent flattening of the natal cleft and lateralization of the wound. Good hemostasis was achieved by the use of electrocauteryand a suction drain was placed in the wound cavity through a separate stab incision, the drain was removed after 48-72 hours while the sutures were removed on 10th– 12th postoperative day. Follow up continued for up to one year in outpatient basis.

Results

In this study, nintyeight patients with chronic PNS, were operated by rhomboid excision and Limbergflap reconstruction, 78 male (79.59 %) and 20 female (20.4%) with male to female ratio of 3.9:1.

The age of the patients ranged between 16 to 38 years with the mean age of presentation was 25 years.

The operative time ranged from 26 to 40 minutes and the patients were discharged after 24 to 48 hours while the drain was removed after 48 to 72 hours and the sutures were removed after 10 to 12 days. As shown in table 1.

Table 1: Operative and postoperative data

Data	*Range*
Operative time	26 – 40 minutes
Hospital stay	24 -48 hours
Drain removal	48 – 72 hours
Suture removal	10 – 12 days

The follow up period was 12 months; during this period 6 patients (6.12%) developed seroma in first few weeks that responded to conservative measures, 4 patients (4.08%) had infection within the first few weeks and managed by local wound care and antibiotic cover. Four patients (4.08%) had recurrent sinus after few months and were managed by excisionfollowed by healing by primary intention. One patient (1.02%) had minor wound disruption and treated conservatively. As shown in table 2.

Table 2: Postoperative complications

Complication	Number of patients	Percentage
Seroma	6	6.12 %
Infection	4	4.08%
Recurrence	4	4.08 %
Wound disruption	1	1.02%

Discussion

Sacrococcygeal pilonidal sinus is a common chronic benign disease of young age group [1-8,15], a finding that is also observed in our study as our patients were young with age ranged between 16 – 38 years. The disease is more common in male [5,8], this is also observed in our study as male to female ratio was 3.9:1.

While various methods have been described for the treatment of sacrococcygealPNS, there is ongoing debate regarding the best treatment method[8,13]as all the methods have complications, postoperative infection and recurrence [10].

Thus, the gold standard treatment modality has yet to be established [10]although; the current evidence supports the use of off- midline techniques because of lower recurrence rates and avoidance of all disadvantages of open treatment[4,19] .

Rhomboid excision of the diseased tissue with Limberg flap reconstruction meets the requirement for being the ideal procedure for sacrococcygeal PNS if performed according to appropriate surgical principles[1] .

In this study, nintyeight patients with chronic primary PNS were operated by rhomboid excision with Limberg flap reconstruction and during the follow up period which extended for 12 months, 6 patients (6.12%) developed seroma in the first few weeks after the removal of the drain. These patients were treated conservatively. Wound seroma was a problem in the studies of Jethwanietal[1] who reported seroma in 4.47% of patients, Yogishwarappaetal[4]which was found in 3.8% of patients and İlhan Bali etal[3]in 8% of patients.

Wound infection was acomplication in 4 patients (4.08%) in this study who were treated by local wound care with antibiotic cover. Wound infection was also observed in the studies of Yogishwarappaetal[4],Jethwanietal[1], Sriharietal[10], Gopal Rametal[2]and İlhan Bali etal[3]in which wound infection was seen in 1.92%, 2.9%, 6.5%, 10%, and 10.8% of patients respectively.

Recurrence of PNS is the main problem associated with all surgical methods including Limberg flap reconstruction [10]. Recurrence can be divided into two groups: early and late. Early recurrence is usually due to failure to identify one or more sinuses at incision and drainage, which was not followed by a second – look procedure. Late recurrence is usually due to secondary infection caused by residual hair or debris that was not removed at operation, inadequate wound care or insufficient attention todepilation [5]. In our study 4 patients (4.08%) developed recurrence few months postoperatively.The recurrence rate was 7.1% in the study of AhmetSerdarKaracaetal[15]and in 10% of patients in Gopal Rametal[2],recurrence rate was low, 1.49% in Jethwanietal[1], 2.1% in Srihari RSetal[10] and 0.6% at 12 month and 1.8 % at 24 months postoperatively in the meta-analysis of V. K. Stauferetal[9].While the studies of İlhan Bali etal[3]and Yogishwarappaetal[4]reportedno recurrence.

One patient had minor wound disruption in our study (1.02%), while it was reported to occur in 3.3% in Gopal Rametal[2] and in 2.7% of patients in İlhan Bali etal[3] .

Flap necrosis was observed in some other studies as in Jethwanietal[1], Yogishwarappaetal[4]and Sriharietal[10], but was not a complication in this study. Postoperative hematoma was a complication in up to 21.6% of patients in İlhan Bali etal[3]but did not occur in our patients probably due to meticulous hemostasis achieved intraoperatively by electrocautery.

Conclusion

Rhomboid excision and Limberg flap reconstruction of PNS disease is safe and reliable technique with low complications and recurrence rates if performed according to appropriate surgical principles.

Ethical Clearance: Taken from Baquba Teaching Hospital- Diyala- Iraq

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