INTRODUCTION

Sacroccocygeal pilonidal sinus disease (SPSD) is a worldwide problem affecting, usually, young men and women with a propensity for recurrence that causes significant problems if not dealt appropriately in the primary setting. The higher incidence of the disease is noted among males and army recruits.\(^{1-4}\)

An understanding of the pathophysiology of the formation of the sinus and progression of the disease had been a matter of controversy and debate till the elucidation of the same in works of Karydakis in the year 1992.\(^{5}\)

The management of the disease is primarily surgical with a variety of procedures being described ranging from wide excision, excision with midline closure, oblique excision and asymmetric closure to flap procedures such as Karydakis and Limberg flap procedures.\(^{1,4,6}\) It has been proved that flap procedures are superior to traditional methods of excision of the tract in terms of preventing recurrence of the lesion.\(^{1,6}\) The procedure of choice however remains debatable. On the other hand, flap procedures are often accused of being time-consuming and technically demanding.

In this study, we attempt to evaluate patients with SPSD who underwent Karydakis procedure at our centre with reference to the perioperative findings, early and late postoperative results and recurrence.
postoperative results and recurrence. The principle of Karydakis procedure being flattening of the natal cleft and lateral shift of midline (scar), which prevents lodging of hair in the natal cleft and hence recurrence.

MATERIALS AND METHODS

Study group
The present study was undertaken as a prospective study from January 2001 to December 2010. All patients who were subjected to Karydakis procedure for SPSD at our centre were included in the study whether presenting with primary [Figure 1a] or recurrent disease [Figure 1b]. All procedures were performed by a single surgeon.

Patients with acute pilonidal abscess were excluded from this study.

Procedure
All patients underwent routine workup for surgery. A third-generation cephalosporin was used as premedication administered 1 h before surgery.

All procedures were done under spinal anaesthesia. Patients were placed in prone jack knife position. A small quantity of dilute methylene blue is instilled into the sinus tracts. An asymmetrical ellipse was marked to encompass the pilonidal complex [Figure 2a]. The upper and lower ends of the ellipse thus marked were at least 2 cm away from the midline.

The area thus marked was then excised full thickness up to the sacral fascia [Figure 2b and c] with a straight edge on the side of flap mobilisation and a sloping edge on the other side [Figure 3a]. This is followed by mobilisation of the flap across the midline [Figure 2d and 3b]. A layer of 1-0 polyglactin sutures was placed, the needle being passed into the sacral fascia in the midline and then into the V junction of the flap [Figure 2e] and secured. A suction drain was placed and brought out well laterally.

A second layer of polyglactin sutures was then placed to secure the flap to the lateral edge of the wound. Skin was approximated using 2-0 nylon mattress sutures [Figure 3c] and a pressure dressing was applied.

Wound inspection was done on 2nd postoperative day [Figure 4a] and patient was discharged, usually, removed on the 11th or 12th postoperative day.

Following suture removal patients were followed-up once in 2 weeks for the next one and a half months [Figure 4b], followed by once every 2 months for the next 6 months and then once in 6 months henceforth.

The following parameters as mentioned in table below were assessed with respect to each patient.

| Parameters assessed                  | Preoperative | Intraoperative | Postoperative |
|--------------------------------------|--------------|----------------|---------------|
| Primary/recurrent disease            |              | Operative time | Drain duration |
| Secondary openings                   |              |                | Removal of suture |
|                                      |              |                | Hospital stay   |
|                                      |              |                | Wound collection |
|                                      |              |                | Wound infection |
|                                      |              |                | Recurrence      |

RESULTS AND ANALYSIS

A total of 103 patients underwent this procedure over a period from January 2001 to December 2010 of which 87 were males, and 16 were females. The age of patients ranged from 15 to 57 years with a mean age of 26.45 years with the majority (78 out of 103-75.72%) in the 21 to 40 year’s age group. The presenting complaints were discharge from the natal cleft in 95 patients, followed by pain in 51 patients. Eight of these patients had recurrent disease and had undergone a primary procedure like excision and curettage or excision and primary midline closure. Sixty-four patients were found to have one or more secondary openings. All cases were found to have these openings within 4 cm cranial or caudal to the primary opening and secondary openings situated laterally were within 2 cm on one side of the midline.

The mean operative time was 74.9 min (range of 60-120 min). Hospital stay was a median of 5 days with a minimum of two and maximum of 15 days. Drains were removed at a median of 7 days (range: 4-12 days). Suture removal was done at a median of 15 days.

Twenty-one patients presented with serous collection in the wound. Six patients had wound infection. In patients with serous collection, the collection was let out following which wounds healed within 2 weeks of regular dressings. In patients with wound infection, pus was drained, and they were administered appropriate antibiotics and underwent regular dressing. In five patients, the wounds healed by secondary intention within 3-4 weeks. Only one patient in
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the above group had to be taken up for secondary suturing at the end of 4 weeks and healing was complete in another 3 weeks. This was an obese patient who had recurrence twice following excision and primary midline closure and underwent Karydakis procedure the 3rd time.

The patients were followed-up for a median of 29 months with the minimum follow-up being 4 months and the maximum of 78 months. No recurrences were noted in any of the cases.

**DISCUSSION**

Sacrococcygeal pilonidal sinus disease is a health issue affecting young adults worldwide that requires surgical intervention. Recurrences have led to a variety of procedures being practiced from simple excision to complicated flap procedures. Procedures like wide excision or excision with primary midline closure though simple pose a greater risk of recurrence (up to 16%) compared with flap procedures.\[6\] A study by Awad et al.,\[7\] put forward a scoring system to classify the cases into three groups. Depending on the scores, the patients underwent excision with secondary healing, excision with primary midline closure or flap procedure. Though it was a novel attempt to address this issue, simple wide excision is seldom practised in centres dealing with pilonidal sinus regularly given the longer time taken for healing and also propensity to recur. Hence, procedure of choice remains controversial often led by the merits of the individual case and also the surgeon’s school of training and experience.

In our study, most patients were young adult males with a ratio of 5.4:1 = Male:female that corroborates with the natural presentation of the disease.\[1\] These patients underwent Karydakis procedure. Complications noted were serous wound collection in 21 patients (20.3%) and wound infection in 6 patients (5.8%). Most of the patients were discharged within 5 days with only eight patients staying >10 days. Other studies have quoted hospital stay ranging from 1 to 4 days.\[8\] The longer hospital stay for a few patients in our study can be attributed to our initial apprehension as well as the fact that patients with complications like wound infection and those who were reluctant to go home with drain *in-situ* stayed back for longer periods.
Karydakis procedure is thus an effective procedure for management of pilonidal disease. One limitation we noticed during our study is that, in patients having secondary sinuses too far away from the midline, Karydakis procedure would be difficult to perform as the area of excision and advancement becomes very large. In these cases, a rotational flap procedure would probably be a better choice.

CONCLUSION

Karydakis flap procedure is a relatively simple procedure for SPSD with reproducible low recurrence rates. However, in patients with secondary sinus openings on both sides of the midline or in cases where the openings are placed too lateral to the midline, it would be difficult to perform this procedure.

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