Outcome of Surgical Management of Sacrococcygeal Pilonidal Sinus Disease with Rotation Flap in 52 Patients—A Retrospective Study

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Abstract

Background Surgical treatment of sacrococcygeal pilonidal sinus disease (SPSD) consists of radical excision of the entire tract and treatment of the resultant raw area. Here, the authors have reviewed the results of the rotation flap for closure of the SPSP. This study aims to evaluate the outcomes following SPSP excision and rotation flap closure.

Materials and Methods All patients were treated for SPSP with excision and closure using a rotation flap from January 2010 to September 2018. Cases having a follow-up of at least 6 months post surgery were evaluated.

Result A total of 52 patients were included in the study; 42 cases were of primary disease while 10 were of recurrent disease. The patients' follow-up records on the 3rd day, 10th day, 1 month, and 6 months were evaluated.

None of the patients showed any signs of recurrence on follow-ups. One patient developed a hematoma on the third day post surgery which was treated conservatively. One patient developed a seroma in the perianal region on the fifth postoperative day which required aspiration. Both these patients healed well subsequently.

Conclusion Rotation flap is a (simple and reliable) treatment option for closure of postexcision SPSP defect. It not only takes the tension away from suture line, but also pushes the gluteal fat from the sides into the midline, obliterating the deep crevice of the natal cleft which is believed to be one of the important factors in the causation of SPSP, thus minimizing recurrence.

Keywords

- pilonidal sinus
- rotation flap

Introduction

Sacrococcygeal pilonidal sinus disease (SPSP) is characteristically a blind epithelial tract generally containing hair.

It is believed to be caused by excessive hairiness and poor hygiene.¹ Other factors affecting the incidence are increased sweating associated with sitting and buttock friction, obesity, and local trauma. Increased depth, narrowness of the natal

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cleft, and the friction movements of the buttocks pave the way for loose hair to collect and insert into the skin of the natal cleft. The hair is perceived as a foreign body, and this initiates an inflammatory response that can then lead to a pocket of infection, leading to an abscess or sinus formation.

The prevalence of SPSP is 4%.¹² As observed by Akinci et al.,³ SPSP has a predilection for patients having a deeper natal cleft.

Surgical excision of the entire sinus tract is the mainstay treatment option for SPSP. Several methods have been described for the closure of the postexcision SPSP defect which include vy-plasty, z-plasty, and w-plasty. However, no consensus exists on a standard method for closure. In this study, the authors have evaluated their results of performing a rotation flap for the closure of postexcision SPSP defect. Rotation flap has been used in plastic surgery,⁴ but its use in SPSP was reported only once.⁵ Other publications claiming rotation flap for the treatment of SPSP are in fact transposition flaps by definition.⁶

Materials and Methods

Fifty-two patients treated for SPSP with excision and closure using rotation flap from January 2010 to September 2018 were included in this study as per the inclusion criteria:

1. Primary cases of SPSP with a postexcisional defect of 4 cm or more in its transverse diameter (width), irrespective of length.
2. Recurrent cases of SPSP treated by any other method at least 6 months prior.

Once the diagnosis was made, on OPD (out patient department) basis, pus was sent from the sinus opening for bacterial culture and antibiotic sensitivity for selecting the antibiotic during perioperative period. In case of “no growth,” amoxycillin and clavulanic acid were our drugs of choice. The patient was admitted in daycare.

Surgical Technique

Patients were placed in prone jack knife position. Methylene blue mixed with hydrogen peroxide was instilled through the sinus opening to define the extent of the ramifications of the sinus (►Fig. 1). The area to be excised was carefully marked and the rotation flap was mapped on the skin. As with any rotation flap the length of the arc of rotation was around six times the length of the width of the base of the triangulated defect (►Fig. 2).

This surgery was done under sedation and local anesthesia. A solution for local infiltration was prepared by mixing 30 cm³ of lignocaine 2% with 20 cm³ of bupivacaine 0.5%. 1 cm³ of adrenaline was added to this solution (►Fig. 3). Any remnant of the sinus tract, as visualized by the staining with methylene blue, was also excised. The defect was triangulated.

The rotation flap was designed adjacent to the defect and was rotated about a fixed pivot point to resurface the defect. It is based on random pattern vascularity. Up to 8 cm defect (length of the base of the triangulated defect) can be closed

Fig. 1 Sacrococcygeal pilonidal sinus disease (SPSP) with sinus tract marked with methylene blue and hydrogen peroxide.

Fig. 2 Flap design; for additional advancement a triangle may be excised at the lateral end of the flap.

Fig. 3 Post excision: specimen and defect.

primarily. In case if there is tension on suture line, one can do additional advancement by excising a triangle from the lateral aspect of the base of the pedicle.⁷ This has advantage over a back cut which also allows additional advancement but not at the cost of decreasing the width of the pedicle of the flap, thus endangering the vascularity (►Fig. 2).

The flap was rotated to cover the defect (►Fig. 4) and suturing was done in 2 layers—subcutaneous and subdermal layer with 2-0 polyglyceparone (absorbable) sutures and staples. A closed drainage system was employed. The patient was discharged on the same evening.

These patients were advised 1 week bed rest.

Fig. 4 Rotation flap completed with drainage tube.

They were recalled for follow-up after 48 hours to check for any hematoma and removal of drain. Further follow-up was after 8 days for removal of staples, and subsequently every month for the first 6 months and thereafter every 6 months (► **Fig. 5**).

Records of the patient follow-ups on the 3rd day, 10th day, 1 month, and 6 month post surgery were evaluated (► **Fig. 5**).

Results

A total of 52 patients were included in this study. Their age ranged from 19 years to 36 years (mean 29.4 ± 5.5 years). Forty were males and 12 were females. Forty-two cases were of primary disease and 10 were of recurrent disease.

As evaluated intraoperatively, the transverse defect, post excision, ranged from 4 cm to 10 cm, with the mean 9.4 ± 1.14 cm.

As evaluated on the third day post surgery, 1 patient out of 52 had hematoma formation, which was treated conservatively, while the rest had shown uneventful healing.

As evaluated on the fifth day post surgery, 1 patient developed a seroma in the perianal region that required aspiration. However, subsequent healing was uneventful.

At 1 month post surgery follow-up, all 52 patients had no signs of any recurrence of the disease and a healthy suture line.

At 6 month post surgery follow-up, all 52 patients had no signs of any recurrence.

Laser depilation of the back and trunk was undertaken for all our patients.

Discussion

The surgical treatment of SPSPD should intend toward removing all the sinus tracts as well as the predisposing factors that contribute to the formation of pilonidal sinus. A major predisposing factor is the deep groove of the natal cleft which needs to be obliterated⁸ (► **Figs. 6 and 7**).

The treatment described in literature varies from conservative to complicated musculocutaneous flaps depending on the presentation of the disease and the competence of the surgeon. Some authors treat patients with abscess and

Fig. 5 Long-term results 1.

Fig. 6 Deep groove in natal cleft in patients with sacrococcygeal pilonidal sinus disease (SPSPD).

Fig. 7 Groove being totally obliterated after surgery.

active infection in two stages, the definitive repair being the second stage.

In an extensive review from 1945 to 2017 by Johnson et al⁹ it has been suggested that primary closure is better than marsupialization or secondary closure¹⁰ in terms of recurrence.

Table 1 Compilation of results of previous studies by other authors to ours for the surgical management of sacrococcygeal pilonidal sinus disease (SPSD)

Operation	Author	Anesthesia type	Length of hospital stay (days)	Follow-up (years)	Morbidity (%)	Recurrence (%)
z-Plasty (transposition)	Monroe and MacDormett ¹⁴	GA	21	–	–	0
z-Plasty (transposition)	Toubanakis ¹⁵	–	–	1–10	0	0
w-Plasty (transposition)	Roth and Moormen ¹⁶	GA	5.7	–	–	8
Asymmetric incision (off-midline)	Karydaikys ^{17,18}	GA	3	2–20	8.5	>1
Asymmetric incision (off-midline)	Bascom ¹⁹	–	–	–	8.5–9	1–4
V-Y advancement	Khatr ²¹		5	0.4–4.5		
Rhomboid flap	Milito ²³	GA/ SA	5.3	6.2	3	0
Elliptical rotation Flap	Omer ⁶	–	1	–	0.8–4.1	0
Rotational advancement flap	Mistry	LA/ sedation	1	0.5–5	3.8	0

Abbreviations: GA, general anesthesia; LA, local anesthesia; SA, spinal anesthesia.

Moreover, if the suture line is off midline, then the results are better with lower recurrence rate and wound dehiscence.

Recurrence of this disease is mainly due to incomplete elimination of the primary SPSP or due to persisting predisposing factors which include excessive hairiness, poor hygiene, and deep natal cleft.^{11–13}

We instilled hydrogen peroxide with methylene blue into the sinus opening to delineate the secondary and tertiary branches. The effervescence created by hydrogen peroxide facilitates the dye into the branches of the sinus, hence decreasing the chances of incomplete excision.

For reconstruction following excision, various flaps have been described. The z-plasty procedure was described by Monroe and Macdermott.¹⁴ The disadvantage of this procedure was that part of the suture lining would lie in the midline which would predispose to recurrence. Another caveat of this procedure was a 20% incidence of flap tip necrosis.¹⁵

The w-plasty technique was described by Roth and Moorman in 1977.¹⁶ Again, part of the wound still remained in the midline and recurrence rate was as high as 8%.

Off-midline closure was described by Karydakos.^{17,18} In his personal series of more than 6,000 cases treated, he reported in 1992, the rate of recurrence as less than 2% and wound complications as 8%. Similarly, Bascom has described “cleft lift” procedure to get off midline closure.¹⁹ Though the recurrence rate was low (1–4%), complications like wound dehiscence were high (8.5–9%).²⁰

Similarly, flaps like the rhomboid and fasciocutaneous v-y advancement flap have also reported a recurrence of 6% and 17%, respectively.^{21–24}

Thus, it is evident that several operative methods are available for the treatment of SPSP; however, no consensus exists on a gold standard method for treatment.^{9,25,26}

The advantage of rotation flap over other methods, first, is that it has a simple design. It can be raised by any not-so-experienced surgeon. It is based on random pattern vascularity and, therefore, is reliable and heals well with almost no risk of failure.

Second, it gives wide exposure to the floor of the wound to visualize and excise any residual disease. Moreover, since large defects can be closed effectively, no compromise is needed on the excision.

Third, it flattens the natal cleft as it brings large amount of subcutaneous gluteal fat into the natal cleft region, thus greatly reducing a major risk factor in recurrence of SPSP.

Lastly, off-midline closure is achieved without tension on the suture line with aesthetically acceptable scar.

In our study, we have observed no recurrence in any of the patients. All our patients healed well except in two cases (3.85%) that had minor wound complications and they also healed with conservative measures. The long term results are shown in (► Figs. 8 and 9).

Fig. 8 Long-term results 2.

Fig. 9 Long-term results 3.

Table 1 represents the compilation of results of previous studies along with this study.

Conclusion

In our experience, single-stage surgical excision of the sinus tract using hydrogen peroxide and methylene blue for delinication and closure of the excision defect with rotation flap is a credible treatment option for SPSD.

Financial Disclosure

None.

Conflict of Interest

None declared.

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