Efficacy of Excision with Tension-free Primary Closure for Sacrococcygeal Pilonidal Sinus: A single-center tertiary care experience

Jumana Fatima,[1] Muhammad Imran Anwar,[2] Muhammad Ali Rafique,[3] Muhammad Haris Janjua,[4] Muhammad Saqib Munir Rana,[5] Hassan Tariq[6]

Abstract

Objective: This study aims to evaluate the outcomes of simple excision and tension-free primary closure for sacrococcygeal pilonidal sinus.

Method: All the consecutive patients who underwent excision and primary closure for sacrococcygeal pilonidal sinus from February 2019 to May 2020 at Shaikh Zayed Hospital Lahore were studied retrospectively. Patients' demographics, operative details, postoperative complications, and recurrence were recorded and analyzed.

Results: A total of 50 patients (47 males and 3 females) were included in this study. The mean age and average BMI of the patients were 27.5 ± 6.36 years and 27.2 ± 1.76 kg/m2, respectively. VAS scores for postoperative pain were 6 ± 2.16, 2.5 ± 2.12, and 1.5 ± 0.70 on the 1st, 5th, and 10th postoperative days. Only 4 (8%) patients developed postoperative complications and the rest of the 46 (92%) patients recovered uneventfully. The overall success rate of excision with tension-free primary closure for PSD was 92%.

Conclusions: Complete excision with tension-free primary closure is a less invasive operative procedure for uncomplicated pilonidal sinus. It is associated with a higher rate of successful recovery, shorter hospital stays, and a low incidence of postoperative complications. Hence, the authors advocate this method as a preferred surgical option for the management of non-complex sacrococcygeal pilonidal sinus.

Keywords: Excision, Sacrococcygeal Pilonidal Sinus, Primary Closure, Hospital Stay, Post-Operative Complications, Recurrence

How to cite: *Fatima J, Anwar MI, Rafique MA, Janjua MH, Rana MSM, Tariq H. Efficacy of Excision with Tension-free Primary Closure for Sacrococcygeal Pilonidal Sinus: A single-center tertiary care experience . Esculapio - JSIMS 2022;18(02):143-147*

DOI: ***https://doi.org/10.51273/esc22.251828***

Introduction

The pilonidal sinus is a fibrous tract lined by granulation tissue in the natal cleft, which often contains loose hair.[1] First described in 1883,[2] it mainly affects young adults with an incidence of 26:100,000 population.[3] It is predominantly seen in the age of 15 to 45 years,[4] being prevalent in males 2 to 4 times more than the females.[5] Formerly, the pilonidal disease was considered to be of congenital origin, but in current literature, it has been understood as an acquired condition caused by the retention of hair in the gluteal cleft.[3] Presence of hair in the intergluteal cleft induces an inflammatory reaction that leads to chronic infection, formation of abscess, and multiple sinus tracts or fistulas.[6]

Sacrococcygeal pilonidal sinus disease is linked with certain predisposing factors, which include deep natal cleft, trauma, excessive hair growth, high BMI, sweating,

1. *Department of Plastic Surgery, Shaikh Zayed Hospital, Lahore*
2. *Surgical Unit II, Department of Surgery, Shaikh Zayed Hospital, Lahore*
3. *Department of Plastic Surgery, Shaikh Zayed Hospital, Lahore*
4. *East Surgical Ward, Mayo Hospital, Lahore*
5. *Department of General Surgery, Our Lady of Lourdes Hospital, Drogheda (Ireland)*
6. *Department of Anesthesiology, Ghurki Trust Teaching Hospital, Lahore*

Correspondence:
Dr. Jumana Fatima, *Trainee Registrar, Department of Plastic Surgery, Shaikh Zayed Hospital, Lahore. E-mail: jumanafatima@gmail.com*

Submission Date: 02-02-2022
1st Revision Date: 13-2-2022
Acceptance Date: 26-03-2022

tight body wears, long sitting hours, and professions such as barbers or jeep drivers.[7] The affected people commonly present with the symptoms of discharge, pain, and swelling.[1] Besides physical discomfort, a troubled social life is among the major concern of the patients.

The treatment of choice for pilonidal disease is surgical management.[5] Surgical approach varies according to the patients' presentation and the surgeon's choice. The basic principle of surgery is the excision of all the sinus tracts to flatten the natal cleft, which is followed by healing of surgical wound with primary or secondary intention.[8]

Primary wound healing can be achieved either by midline suture closure or flap techniques e.g. V Y flaps and rotational flaps such as Limberg flap, modified Limberg flap (MLF), and gluteus maximus myocutaneous flap.[9] Singh A et al have affirmed that excision and primary midline closure is a safe procedure for uncomplicated pilonidal sinus with a mean operative time of 30 minutes, an average hospital stay of 1 day, return to normal activity within 8-14 days, and zero recurrences in a 6-month duration.[10] Despite the numerous surgical options, an optimal corrective operation for pilonidal sinus remains controversial.[3]

The objective of this study is to evaluate the outcomes of simple excision of the pilonidal sinus with tension-free primary midline closure in terms of duration of surgery, post-operative pain, hospital stay, postoperative complications, and recurrence. The results of this study will serve as an addition to the pre-existing literature as well as a guide for the management of this debilitating disease in our geographical area.

Material and Methods

This cross-sectional study was conducted from February 2019 to May 2020 at the Department of Surgery, Shaikh Zayed Hospital Lahore. All the patients of both genders, between 18-80 years of age with a history of pilonidal sinus for the last 1 year and who underwent excision and primary closure for pilonidal sinus under spinal anesthesia by a single surgical team in the same peri-operative settings were included in this study. Those with clinical and intraoperative findings of acute pilonidal abscesses as well as complex pilonidal sinuses (i.e. multiple fibrous tracts lined with granulation tissue or communicating with other organs), and those with documented ischemic cardiac conditions, coagulation disorders, and immunosuppressive states were excluded from the study.

A proforma was designed to collect all the data. Patients' demographic particulars (age, gender, addresses, and contact numbers), clinical signs and symptoms, dates of admission, operation, and discharge were noted in the proforma. Operative time, intra-operative findings, post-operative outcomes (i.e. VAS score for pain at 1st, 5th, and 10th postoperative day (POD), drain and suture removal days, postoperative complications, and duration of hospital stay), significant clinical findings on follow-up visits, and recurrence (if any) were also recorded.

All the patients took a post-operative five-day course of Ciprofloxacin (500mg × BD) and Metronidazole (400mg × TDS). All of them were advised to have bed rest for 1 week on their discharge letters. Patients were discharged with drains in situ and were recalled for follow-up at 5th and 10th POD for removal of drain and sutures, respectively. All the patients continued to be followed up for 12th months after the surgery.

The study was approved by the Institutional Review Board (IRB) of Shaikh Zayed Medical Complex, Lahore on 23rd December 2020.

Under spinal anesthesia, the patient was put in the Jack-Knife position to expose the inter-gluteal cleft. Both gluteus muscles were abducted by adhesive tapes attached to the sides of the operation table. Sinus openings were probed and hydrogen peroxide was injected through a feeding tube to delineate the main tract and its side branches if present. An elliptical incision was made around the sinus openings, all of the sinus tracts or cysts were excised and the dissection was continued down to the posterior sacral fascia. Bilateral skin and subcutaneous tissue edges were undermined to avoid closure of the defect under tension. Hemostasis was secured meticulously and a Redivac suction drain # 16 was placed in the wound bed. Interrupted tension sutures with Prolene-1 were laid and the wound was approximated by taking Prolene-1 mattress sutures through the skin, subcutaneous tissue, and posterior sacral fascia. Later on, tension sutures were tied over a gauze partially soaked with povidone-iodine and normal saline.

Statistical Package for the Social Sciences (SPSS) Ver. 20 was used for statistical analysis. Age, duration of symptoms, operative time, VAS scores, drain removal day, period of hospital stay, day of suture removal, and duration of return to normal activity were

described in mean ± standard deviation (SD). Data for gender, past history of pilonidal disease, post-operative complications (if any), and recurrence were expressed in terms of frequency and percentages.

Result

The present study included a total of 50 patients with PSD i.e. 47 (94%) males and 3 (6%) females. The mean age of the patients was 27.5 ± 6.36 years and the average BMI was 27.2 ± 1.76 kg/m2. In addition, a positive family history of pilonidal sinus disease was observed in 13 (26%) patients. (Table 1)

Table 1: *Patients' Characteristics and Course of Disease*

Total patients	50 (100%)
Males	47 (94%)
Females	3 (6%)
Mean age (years)	27.5 ± 6.36
Average BMI (kg/m^2)	27.2 ± 1.76
Positive Family History	13 (26%)
Past history of pilonidal surgery	5 (10%)
Mean duration of symptoms (months)	3.1 ± 0.42
Mean operative time (minutes)	32 ± 1.58

The mean VAS score for pain was 6 ± 2.16, 2.5 ± 2.12, and 1.5 ± 0.70 on the 1st, 5th, and 10th postoperative days, respectively. Patients were discharged in 1.5 ± 0.50 days

Table 2: *Post-Operative Outcomes*

Mean postoperative pain (VAS* Score)	1st POD	6 ± 2.16
	5th POD	2.5 ± 2.12
	10th POD	1.5 ± 0.70
Average hospital stay (days)		1.5 ± 0.50
Drain Removal (POD)		5 ± 1.41
Suture Removal (POD)		10 ± 2.82
Average return to normal activity (days)		11 ± 4.24
Postoperative Complications		4 (8%)
• Seroma		2 (4%)
• Hematoma		1 (2%)
• Wound infection		1 (2%)
Recurrence		0 (0%)

*VAS: Visual Analogue Scale

with drain. Drain and sutures were removed later on in the Outpatients Department. On average, patients reported a return to their normal activities in 11 ± 4.24 days post-operatively. (Table 2)

Postoperatively, 46 (92%) patients healed completely without any difficulty. However, 4 (8%) patients were affected by the postoperative complications. Amongst these four patients, two patients developed seroma after drain removal on the 5th POD that was treated conservatively with empirical antibiotics and anti-inflammatory agents. One patient suffered from hematoma formation on the 2nd POD due to blockage of the drain, which was managed by flushing the drain with saline. Additionally, one patient got his wound infected by Staphylococcus aureus requiring culture-specific antibiotic (Linezolid), the removal of alternate stitches for drainage, and wound healing by secondary intention. None of the patients reported any signs or symptoms of recurrence during the follow-up period of one year. (Table 2) Hence, the complication and recurrence rates recorded in our study were 8% and 0%, respectively. (Fig-1)

In our study, 46 out of 50 patients showed an uneventful recovery without any complication or recurrence up to a follow-up period of 12 months. Thus, the overall success rate of excision with tension-free primary closure for sacrococcygeal pilonidal sinus was 92%.

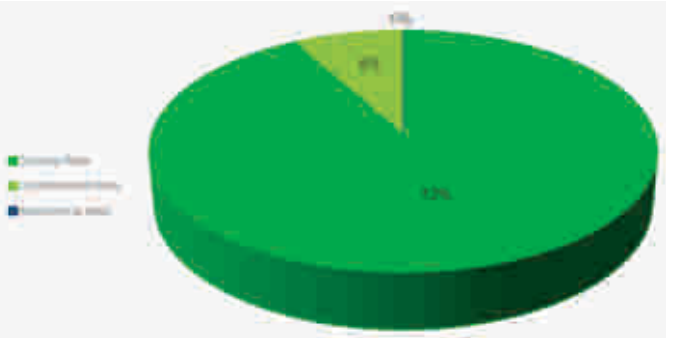

Fig-1: *Overall Success Rate of Excision with Tension-free Primary Closure for Sacrococcygeal Pilonidal Sinus*

Discussion

Pilonidal sinus is predominantly encountered before the 4th decade of life.[9] It affects the patients by posing significant physical discomfort, disturbed social life, and deterioration in the quality of life.[11] Management of pilonidal disease has evolved from conservative non-surgical to surgical techniques such as simple un-roofing, excision with primary closure, Z-plasty or advancement flaps, along with several minimally invasive therapeutic approaches e.g. pure phenol application, and laser

therapy.[12] Despite various management strategies, the standard treatment for PSD is still debatable among surgeons.[13]

The ideal management of the pilonidal disease should be less invasive ensuring rapid healing, shorter hospital stay, early return to normal life, decreased postoperative morbidity, and minimal recurrence.[13] Literature has revealed that excision with primary closure techniques is effective in attaining higher healing rates of 77 to 100%.[14]

In our study, the mean age was 27.5 ± 6.36 years, which can be attributed to the high sex hormone levels in young individuals.[15] Males, being more hirsute, are nearly 4 times more affected with PSD as compared to the women.[5] However, a significantly greater male-to-female ratio of 15.6:1 was observed in our study population. These results are quite relatable to another local study by Janjua MH et al[16] and can be ascribed to the socio-economic and cultural impediments that refrain the women of our geographical area to approach the hospitals. Moreover, the mean BMI of patients (i.e. 27. 2 ± 1.76 kg/m^2) in our study was above the normal values and around one-fourth (26%) of the patients had a positive family history, in concordance with the studies that described the body weight and family history as risk factors in the development of sacrococcygeal pilonidal sinus.[15, 17] However, our study has found no association of past surgery with the healing rate.The success of the surgical management for pilonidal disease lies in the complete removal of all the pilonidal sinus tracts. Alkata MA et al have observed a recovery rate of 78.2% after simple excision with tension-free closure of the pilonidal sinus.[13] Similarly, Singh A et al reported the efficacy of excision with primary closure for treatment of PSD in 37 out of 40 patients in his study.[10] In our study, a 1-year follow-up revealed a success rate of 92% with simple excision and primary midline closure, which is congruous with the earlier observations. These results can be accredited to the meticulous intra-operative dissection, tension-free primary midline closure, and diligent post-operative care by our surgical team.

Post-operative pain and patient discomfort are among the important factors that affect the choice of procedure for pilonidal disease. The VAS scores for pain at 1st, 5th, and 10th POD have shown minimal postoperative pain after excision with primary closure of pilonidal sinus and these scores are comparable to a study by Arnous M et al.[8] In our study, operative time, duration of hospitalization, and average return to normal activities of the patients was 32 ± 1.58 minutes, 1.5 ± 0.50 days, and 11 ± 4.24 days. These outcomes, being supported by several research works, establish the superiority of our technique over the other operative methods such as minimal excision and the Limberg flap procedure.[8,10,13,18]

Hematoma formation and sepsis are the main culprits that impair wound healing. The application of suction drainage systems is remarkably effective in the obviation of these complications.[19, 20] The rates of successful recovery and postoperative infection in our study favor the use of suction drain, which is also in line with previous research works.[20,21]

The recurrence rate is an imperative parameter to evaluate the efficacy of the surgical treatment for pilonidal sinus disease. The recurrence rates of excision with primary closure for PSD found in the published data ranged between 1 to 43%.[8,10] In our study, no recurrence has been recorded during the 12-month follow-up period. This zero recurrence is a notable finding, which augments the reliability and success of our surgical technique.

Excision and tension-free primary closure is a simple, safe, and cosmetically acceptable procedure as compared to excision with healing by secondary intention.[12] It also aims to minimize the duration of operation, post-operative pain, and average hospital stay, which are the inadequacies of reconstructive procedures.[8] Similarly, our study describes the efficacy of excision and primary closure for PSD in terms of less significant local wound complications, no re-admissions, and no reappearance of the symptoms.

Conclusion

Complete excision with tension-free primary closure is a simple, safe, reliable technique for the operative treatment of pilonidal sinus. It implies a greater percentage of successful recovery, low incidence of wound infection, shorter hospital stay, and early return to a normal routine with no recurrence of the disease. Based on these remarkable observations, the authors recommend the excision with primary closure as a preferred method for the treatment of pilonidal sinus.

References

1. Lunnis PJ. The anus and anal canal. In: Williams NS, O'Connell PR, MacCaskie AW eds. Bailey and Love's Short Practice of Surgery, 27th ed. Boca Raton: 2018: 1347-1349.

2. Velotti N, Manigrasso M, Di Lauro K, Araimo E, Calculli F, Vertaldi S, et al. Minimally invasive pilonidal sinus treatment: A narrative review. Open Med. 2019; 14: 532–536. DOI: 10.1515/med-2019-0059.
3. Sinnott CJ, Glickman LT. Limberg flap reconstruction for sacrococcygeal pilonidal sinus disease with and without acute abscess. Our experience and a review of the literature. Arch Plast Surg. 2019; 46(3):235-240.
4. Giuseppe F, Silivia DG, Patrizia R, Riccardo P, Antonio DS, Aldo RS, et al. Pilonidal sinus disease: Preliminary case-control study on heat wound dehiscence. Ann Med Surg 2019; 48; 144-149. DOI: 10.1016/ j.amsu. 2019. 07.032.
5. Alvandipour M, Zamani MS, Ghorbani M, Charati JY, Karami MY. Comparison of Limberg flap and karydakis flap surgery for the treatment of patients with pilonidal sinus diseases. Ann Coloproctol. 2019; 35(6):313-318.
6. Esposito C, Gargiulo F, Izzo S, Cerulo M, Del Conte F, Severino G, et al. Pediatric endoscopic pilonidal sinus treatment: An effective procedure for children with recurrent pilonidal sinus disease after failed open surgery. J laproendosc Adv Surg Tech A. 2019; 29(7): 981-986.
7. Hussein AA. The outcome of opened method versus closed method of chronic Pilonidal Sinus (PNS) at Baquba Teaching Hospital. Int. J. Adv. Res. Biol. Sci. 2018; 5(7):56-53.DOI:http:// dx.doi.org/10.22192/ ijarbs.2018.05.07.002
8. Arnous M, Elgendy H, Thabet W, Emile SH, Elbaz S A, Khafagy W, et al. Excision with primary midline closure compared with Limberg flap in the treatment of sacrococcygeal pilonidal disease: a randomised clinical trial. Ann R Coll Surg Engl. 2019; 101(1):21-29.
9. Sarhan AE, Sherif T, Zakaria Y. A prospective randomized trial comparing modified Limberg flap and cleft lift procedure in treatment of uncomplicated sacrococcygeal pilonidal disease. Egypt J Surg. 2016: 35(2): 89-95
10. Singh A, Kumar S, Jyoti V, Yadav P, Pandey A. Excision and primary closure of pilonidal sinus: excellent results. Int Surg J 2017; 4:3711-3.
11. Choy KT, Srinath H. Pilonidal disease practice points: An update. Aust J Gen Pract. 2019; 48(3):116-8.
12. Kober MM, Alapati U, Khachemoune A. Treatment options for pilonidal sinus. Cutis. 2018 Oct 1; 102(4): E23-9.
13. Alkatta MA, Mejally A. Excision and tension-free primary closure of pilonidal disease. Turk J Surg. 2019 Dec 16; 35(4):278-284. DOI: 10.5578/turkjsurg. 4368. PMID: 32551424; PMCID: PMC7282449.
14. Rogers P, Platell C, Levitt M. Minimal tissue excision in the treatment of pilonidal sinus disease: results from a single surgical unit. ANZ journal of surgery. 2020 Apr; 90(4):529-32.
15. Miller D, Harding K. Pilonidal sinus disease. World Wide Wounds. 2003 Dec. Available at: http:// www. worldwidewounds.com/2003/december/Miller/Pilonidal-Sinus.html
16. Janjua MH, Mohsin J, Fatima J, Siddique MU, Naseem MY, Gill AJ. Comparison of outcome of simple excision and primary closure with Limberg Flap procedure in Pilonidal disease. Isra Med J. 2021; 13(1): 11-14.
17. Manigrasso M, Velotti N, Fernandez LMS, Vertaldi S, Maione F, Gennarelli N, et al. Endoscopic Approach to Recurrent Pilonidal Sinus: A Retrospective Analysis. Journal of Laparoendoscopic & Advanced Surgical Techniques. 2021 Jan 1; 31(1):1-5.
18. Elgohary HG, Oraby EM. Pilonidal sinus: minimal excision and primary closure under local anesthesia. Egypt J Surg 2015;34:287-92
19. Kela M, Sharma R, Jain S. Our experience of simple technique for successful primary closure after excision of pilonidal sinus disease. International Surgery Journal. 2016 Dec 14; 2(4):647-51.
20. Iqbal MN, Asghar M, Waseem M, Bashir HM, Kousar N. Outcome of suction drain after excision of pilonidal sinus. JSZMC 2019;10(1): 1591-94
21. Tritapepe R, Padova DC. Excision and primary closure of pilonidal sinus using a drain for antiseptic wound flushing. Am J Surg. 2002; 183:209-11.

Authors Contribution

JF, MIA: Conceptualization of Project
JF, MIA: Data Collection
MHJ, MSMR: Literature Search
JF, MAR: Statistical Analysis
HT, MHJ: Drafting, Revision
MAR, HT: Writing of Manuscript