



Modified Endoscopic Pilonidal Sinus Treatment (MEPSiT): Personal Experience

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Received: May 24, 2024

Published: June 12, 2024

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Abstract

Background: Surgical management of sacrococcygeal pilonidal disease remains debatable, with the optimal surgical approach is yet to be determined. The treatment of any disease should not be disabling more than the disease itself, hence the ideal surgical management of pilonidal disease should allow a quick recovery, minimally effecting lifestyle in the postoperative period, early return to normal daily activities and a low recurrence rate. Herein, we present our experience in management of pilonidal disease using a modified endoscopic pilonidal sinus treatment (MEPSiT).

Methods: From July 2018 to October 2022, a total of 90 patients with symptomatic pilonidal disease underwent the modified endoscopic pilonidal disease excision, clinical, operative, and follow up data were recorded.

Results: 90 patients were included in the study. The mean number of openings per patient is 2 openings, were localized to midline in 56 percent of cases. In 44 percent of cases there were openings in the midline as well as a lateral opening. All patients returned to normal daily activities unlimited by pain on the first postoperative day. All patients return to work 2 days after surgery. No wound complications were encountered. After a minimum follow up of 12 months, complete wound healing was achieved in all 90 patients within 33 days. The mean complete wound healing was 24 days. 1 recurrence was encountered. No patients were lost for follow up.

Conclusion: The optimal surgical approach is multifactorial depending on surgeon preference, extent and anatomy of the disease on one side. And on the other side, patients request and expectations. From this perspective, MEPSiT is an attractive option with promising results.

Keywords: Endoscopic Pilonidal Sinus Surgery; Minimally Invasive Surgery; Pilonidal Disease; EPSiT

Introduction

Sacrococcygeal pilonidal disease is a relatively common disease especially among young adults. Patients usually present with a wide spectrum of presentations. Some are incidentally discovered, others present with acute painful bulge at the sacrococcygeal region and some patients present with chronic symptoms of discharge. In its most severe form pilonidal disease can be locally destructive causing significant disability. Diagnosis is usually made from history and physical exam, and doesn't require extensive testing or imaging.

The etiology of pilonidal disease remains controversial, with three theories being most widely accepted the foreign body response theory [1], the Bascom hypothesis of midline pits [2,3] and the Stelzner theory of a retention dermatopathy [4]. Repetitive trauma to the skin at the natal cleft on one hand. And on the other hand, the local anatomy of this area creates a warm, and relatively moist environment leading to hair entrapment. Consequently, a granulomatous foreign body-type reaction is initiated leading to the formation of a sinus that can progress to numerous sinuses and potential abscess formation.

Several risk factors for development of pilonidal disease have been identified including positive family history of disease, elevated body mass index (BMI > 25 kg/m²), poor hygiene, hirsutism, deep natal cleft anatomy, occupation that requires prolonged sitting, and excessive sweating (5, 6).

Although a wide range of surgical options are available for surgical management of pilonidal disease, there is no universal consensus on the optimal surgical procedure. Surgical approach to pilonidal disease can be broadly divided into two major branches, the traditional surgical approach and the minimally invasive one. Among the minimally invasive branch is the endoscopic approach. Herein, we present our experience in surgical treatment of pilonidal disease using the modified endoscopic approach, including the preoperative care, the surgical technique, and the postoperative care and outcomes.

Materials and Methods:

From July 2018 to October 2022, a total of 90 patients with symptomatic pilonidal disease underwent endoscopic pilonidal

disease excision at Saint George Hospital University Medical Center, Beirut, Lebanon. Informed consent was obtained from all patients for publication. In addition, clinical, operative, and follow up data were recorded. IRB was not needed for this study.

Patients presenting with symptomatic pilonidal disease were included in the study. We define symptomatic pilonidal disease as either chronic discharge or history of abscess formation. Patients who are immunosuppressed or on chemotherapy were excluded from the study.

All patients were admitted to the hospital at the day of surgery, and discharged 6 to 8 hours after surgery. All patients were given a dose of 1.2 grams of Amoxicillin/Clavulanic acid 30 minutes prior to surgery. The surgical technique is described below. All surgeries were done by the same surgeon, the author of this article. No changes in the preoperative care strategy, the surgical technique, the postoperative care and follow up and no change in anesthesia given throughout the study.

	Gender	First operation	Second Operation	Midline Pit	Paramedian Opening
1	Male	Open Technique	None	Present	Present
2	Male	Open Technique	None	Present	Present
3	Female	Open Technique	None	Present	Absent
4	Male	Open Technique	None	Present	Absent
5	Female	Closed Technique	None	Present	Present
6	Male	Open Technique	Closed Technique	Present	Absent
7	Male	Closed Technique	None	Present	Absent
8	Female	Open Technique	None	Present	Present
9	Male	Open Technique	None	Present	Absent
10	Male	Closed Technique	Open Technique	Present	Present
11	Male	Open Technique	None	Present	Absent
12	Female	Open Technique	None	Present	Absent
13	Male	Open Technique	None	Present	Absent
14	Male	None	None	Present	Present
15	Male	None	None	Present	Absent
16	Male	None	None	Present	Present
17	Female	None	None	Present	Absent
18	Male	None	None	Present	Present
19	Male	None	None	Present	Absent
20	Female	None	None	Present	Absent

Table 1: Patient characteristics and clinical findings.

	Days for Complete Healing
1	14
2	12
3	8
4	17
5	20
6	17
7	10
8	10
9	21
10	27
11	30
12	10
13	14
14	16
15	18
16	20
17	21
18	23
19	17
20	12

Table 2: Days for Complete Healing.

Prior to surgery

With the aim to optimize the local conditions in preparation for the definitive surgery, all patients presenting with pain and erythema not requiring drainage was given a course of antibiotics (Amoxicillin/Clavulanic acid) for 7 days and reassessed for cellulitis and local conditions after completion of the antibiotic course. All patients presenting with abscess formation was drained and discharged on antibiotics (Amoxicillin/Clavulanic acid) to be scheduled at a later stage, usually 4 to 6 weeks after drainage, for endoscopic resection, once the local conditions of inflammation and infection settle down.

Post-surgery, patients were seen at the time of discharge from hospital, on day 3 post operation, day 6 post operation, and weekly thereafter, up until the wound has healed completely. Long term follows up and disease recurrence were assessed in the outpatient clinic by the same surgeon who did the surgery. Complete wound healing was considered the primary endpoint. Incomplete wound healing is defined as discharge, swelling, or presence of open wound 45 days after surgery.

Recurrence was diagnosed once patients report discharge, swelling or local pain within 1 year after wound healing.

Surgical technique

Epidural anesthesia was given to all patients 1.2 gram of Amoxicillin/Clavulanic acid was given 30 minutes prior to surgery.

The patient is placed in the prone position with their legs slightly apart. The buttocks are separated by two big plasters.

The surgeon stand on the patients left side. Careful inspection of the surgical field to identify all the pits that are present. The largest midline pit is excised by making a 0.5 cm elliptical incision slightly shifted away from the midline.

The modified endoscopic approach has two phases, the diagnostic phase and the operative phase.

Diagnostic phase

The diagnostic phase aims at defining the anatomy of the sinus, secondary tracts if present, any blind ended tracts or cavities, mainly ones that are 2.5 cm and more away from the largest pit that was initially excised even in the absence of an external opening, and any underlying abscess cavity. The fistuloscope is inserted through the external opening, while glycine/mannitol 1% solution is being infused. This maneuver facilitates opening of the sinus tract and clears the vision, however, if difficulty intubating the sinus was encountered, a Kelly forceps can be used to retract the edge of the sinus, as straightening the edges will make it easier to intubate the sinus cavity. Hair, fistula tracts and abscess cavities appear clearly on the screen.

Operative Phase

The operative phase is made of two phases, first the endoscopic phase followed by the draining phase

- The endoscopic Phase:** The aim of the endoscopic operative phase is debriding the main cavity as well as any associated blind ended cavities and tracts, remove any hair present, ablate the cavities by electro cautery, and achieve hemostasis under direct vision. Endoscopic forceps is inserted through the operative channel to debride and remove all visible hair, this is fundamental for complete wound healing and cavity obliteration at a later stage. Once debridement and cleaning is achieved a monopolar electrode is used for cautery ablation of the sinus cavity on one hand. And on the other hand for hemostasis so that to avoid hematoma formation. After initial identification, debridement and ablation of all blind ended tracts. During this phase, all previously identified blind ending tracts and cavities that are 2.5 cm away from the main excised pit (site of entry of the fistuloscope) are marked in preparation for the upcoming draining phase.

- **The draining phase:** The aim of the draining phase is to achieve optimal draining of the sinus cavity, as well as all other cavities being identified in the diagnostic phase that were ablated and debrided during the endoscopic phase. All cavities and tracts more than 2.5 cm away from the initially excised midline pit, marked previously during the operative diagnostic phase, are drained by a circular incision (counter incision) made over the blind ended cavity, so that to avoid long internal tracts being drained solely from the initial midline incision. In addition, all midline external opening are excised. Moreover, all small midline pits are debrided. The number and site of incisions varies depending on the presence of secondary fistula tracts or abscesses; therefore, in more complex cases two or three incisions may be required.

Results

90 patients were included in the study. The mean number of openings per patient is 1.4, openings were localized to midline in 56 percent of cases. In 44 percent of cases there were openings in the midline as well as a lateral opening.

All patients returned to normal daily activities unlimited by pain on the first postoperative day. All patients return to work 2 days after surgery.

No patient experienced wound complications such as hematoma, seroma or necrosis of the overlying skin as a result of cauterizing the cavity.

After a minimum follow up of 12 months, complete wound healing was achieved in all 90 patients within 33 days. The mean complete wound healing was 24 days. 1 recurrence was encountered 1.1 percent. No patients were lost for follow up.

Discussion

Pilonidal disease is a very common inflammatory disease of the sacrococcygeal region. It can result in subcutaneous abscess formation, in addition to recurrent acute and chronic infections at the level of the natal cleft [7]. Although a wide range of surgical options are available for surgical management of pilonidal disease, there is no universal consensus on the optimal surgical procedure. Surgical approach to pilonidal disease can be broadly divided into two major branches, the traditional surgical approach and the minimally invasive one. Traditional surgical techniques are associated with significant postoperative pain on one side and a significant risk of recurrence on the other side.

In view that any treatment should not be disabling more than the disease itself and in view that any treatment should be tailored according to patient's expectations, considering the disease

anatomy and severity. Furthermore, in the era of minimally invasive surgery the modified endoscopic pilonidal sinus treatment (MEPSiT) seems an attractive option, due to the advantages such as quick recovery, minimally effecting the patient's lifestyle in the postoperative period, early return to normal daily activities and a low recurrence rate. MEPSiT procedure allow direct endoscopic vision of the pilonidal sinus from the inside. In this technique all pits are excised or debrided, hair follicles are extracted and the sinus cavity is destructed by electro cautery. In our approach, the step that was not previously described in the medical literature is the additional incisions made over cavities more than 2.5 cm away from the largest pit that was excised will facilitate the drainage and closure of the sinus cavity. Furthermore, the use of negative pressure wound therapy to absorb the exudate accumulated in the obliterated pilonidal sinus cavity and promote wound healing through angiogenesis and activation of intracellular pathways aids in a successful surgical outcome regarding the recurrence rate. We believe combining the two steps, the additional incision as well as the negative pressure wound therapy will further aid in achieving a higher rate of success manifested by a very low recurrence rate.

Wide excision with the wound left open or directly closed remain the most common surgical procedures performed for pilonidal sinus. The disadvantage of healing by secondary intention is that it involves a lengthy healing time (8), but it is associated with significantly lower recurrence rates than closed healing. Primary closure is associated with faster healing and fewer days off work [7,9-11]. However, this potential benefit is offset by the increased risk of wound complications, recurrence and costs, particularly if associated with a reconstructive flap [12]. Furthermore, Allen-Mersh [13] described an average recurrence rate of 13% at 1 year following the use of open methods, and 15% after excision and closure. Hence, traditional surgical techniques are becoming less and less popular and a shift towards using minimally invasive ones in treatment of pilonidal disease is on the rise, especially in view of the young age of the patients, as well as their intense social life, and busy work. Traditional techniques are often associated with serious impairments of patient quality of life and long off-the-job periods. Nordon and Senapati [14] described a median of 2 weeks off work after the Bascom procedure. A recent meta-analysis of RCT comparing surgical outcomes after primary closure or rhomboidal excision and Limberg limb for primary sacrococcygeal pilonidal disease management showed a mean of 9.24% of the surgical infection rate, an average of 5 days postoperative hospital stay, and an average of 20 days for complete return to work [15]. From here, MEPSiT procedure is an attractive option in surgical management of pilonidal disease. It allows the surgeon to directly inspect the sinus tract and any secondary tracts, cavities, and blind ended tracts that may be present and hence contribute for future recurrences. Despite the relatively small sample size in our study, MEPSiT pro-

cedure for pilonidal disease seems to offer adequate and effective results regarding wound healing, and excellent results regarding recurrence at 1 year follow up, reported to be 1.1 percent in our series. Overall, patients undergoing MEPSiT procedure for recurrent pilonidal disease seem to have a high rate of satisfaction. This is attributed to low postoperative pain and the rapid return to work and daily activities. Moreover, during the 1 year follow up patients state that "I will do it again, endoscopically, if it recurred". Despite these promising results, the present study presents several limitations. Firstly, the sample size is relatively small which may lead to underestimation of the complications associated with the use of MEPSiT. Besides, a randomized study, for a better evaluation of the outcome is required.

Conclusion

Although pilonidal sinus disease is frequently observed, the optimal surgical approach is yet to be determined. The optimal surgical approach is multifactorial depending on surgeon preference, extent and anatomy of the disease on one side. And on the other side, patients request and expectations. From this perspective, MEPSiT is an attractive option with promising results.

Acknowledgement

None.

Statement of Ethics

This research complied with the guidelines for human studies and was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. Ethical approval was not required.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

None.

Author Contributions

All authors contributed equally to the writing and preparation of the article.

Data Availability

All data are available upon request.

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