



Study of Pilonidal Sinus Disease

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Abstract

Pilonidal Sinus Disease (PSD) is a common condition that has had controversies surrounding its aetiology and treatment since its first description in the mid-19th century. The prevalence in the UK has been estimated at 0.7% with peak age of incidence at 16 years to 25 years. Males are more commonly affected than females and risk factors include stiff body hair, obesity, and a bathing habit of less than two times a week, and a sedentary occupation or lifestyle (i.e. those who sit for more than six hours a day). Pilonidal sinus disease is best managed by specialists with an interest in the disease such as a colorectal or plastic surgeon experienced in treating recurrent cases. Emergency treatment should primarily consist of off-midline incision and drainage with subsequent referral to a specialist should the condition recur. The aim of this article is to summaries the current practice for treatment of pilonidal sinus disease including difficult modalities used and their limitations.

Introduction

Pilonidal Sinus Disease (PSD) is a common condition with controversies surrounding its aetiology and treatment since its first description in the mid-19th century. It has been attributed to a congenital origin, such as a caudal remnant of the neural tube or sequestered ectodermal tissue during development. The current accepted aetiology is that PSD is an acquired pathology with multiple contributing factors. Hairs, either loose or in the skin, grow inwards due to a combination of local forces and friction acting on the topography of the natal cleft, causing an inflammatory reaction. It is unknown whether hairs are the primary cause of PSD or whether hair follicles become affected by the physical environment leading to micro-abscesses and PSD.

The prevalence in the UK is estimated at 0.7%, with the peak age of incidence at 16 to 25 years. Males are more commonly affected than females, and risk factors include stiff body hair, obesity, a bathing habit of less than two times a week, and a sedentary occupation or lifestyle. Long-term recurrence in PSD has been estimated at 22%, with the majority occurring in the first year but recurrences 20 years after treatment. Recurrence rates should be tracked over a minimum of 5 years, as a long-term study of PSD in a German cohort found that 60% of recurrences occurred within that time frame.

Signs and symptoms of PSD include half of all patients presenting as an emergency with an abscess in the natal cleft, but implantation of hairs can theoretically occur anywhere on the body. Patients with chronic or recurrent PSD have a range of presentations from a simple cyst to multiple pits in the midline of the natal cleft. There is no widespread or recognized system of classification for PSD, but a pragmatic system considering the disease entity in terms of severity is proposed.

Differential diagnosis for PSD includes skin conditions causing midline skin pits, pathology from nearby structures, and cancer. Cancer may arise from within long-standing inflamed PSD tissue, but this is rare and is estimated to involve 0.1% of chronic PSD patients. Management

The management of PSD can be divided into emergency and elective settings.

Emergency

The treatment of PSD abscesses is straightforward with I&D over the pointing lesion [32]. However, in a retrospective case series, an off-midline approach has been reported as healing approximately 3 weeks quicker than incisions over the midline [33]. PSD patients who only present with cellulitis may be treated with antibiotics but there is no strong evidence that this will arrest abscess formation [22,28]. An improvement on the I&D technique has been reported by Khalil et al. [34] who showed that aspiration of the PSD abscess followed by injection of a local anaesthetic and then incision allowed acute PSD to be treated without a general anaesthetic [34].

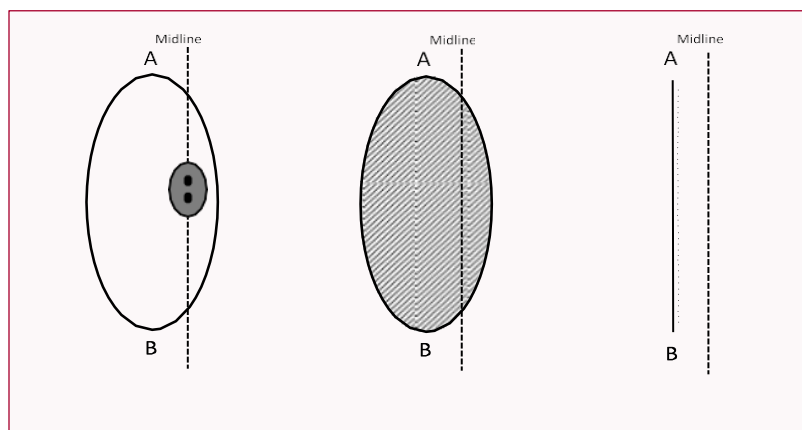


Figure 1: Karydakakis flap

Elective

Treating PSD in an elective setting is a more contentious issue. The mainstay of treatment has been removal of diseased tissue via surgery but the defining variables have been the amount of tissue excised and the method of closing the defect.

Limited vs. Wide excision

The most performed procedure for treating postmenopausal dysplasia (PSD) in the UK is excision of all diseased tissue, but this does not guarantee cure. The Bascom's procedure is the most established less invasive technique, which involves the removal and sutured closure of midline hair pits, drainage, and curettage of the underlying abscess cavity via a lateral incision. Another limited excision technique is de-roofing and curettage of pilonidal sinuses, which has a recurrence rate of 4.47%, low complication rate, and local anesthesia. This technique should be the first line for all types of PSD cases, both acute and chronic. A relatively new procedure, sinusectomy, involves excision of PSD sinuses alone identified by methylene blue, with a low morbidity and recurrence rate of 7%. A recent meta-analysis comparing these two approaches found no significant difference in time to healing and recurrence rate. Limited excision was found to have an earlier return to work and less pain than wide excision. However, the meta-analysis combined sinusectomy with sinotomy and compared these two techniques against wide excision left to heal by secondary intention.

Secondary vs. Primary closure

After excision of affected tissue, the next decision for the surgeon concerns whether to close The use of primary or secondary intention healing in wound closure has been a topic of interest in recent systematic reviews. While no clear benefit was found in primary closure versus secondary intention healing, off-midline wound closure showed a clear benefit in terms of healing time and recurrence rate. A meta-analysis in 2008 showed that primary closure heals more quickly but at the expense of increased recurrence. Off-midline closure also lowered surgical site infection and recurrence rate when performed primarily. A recent meta-analysis by Enrique-Navascues et al. showed that off-midline closure had significantly lower rates of dehiscence and wound infection. A large retrospective review of 569 patients compared midline closure against asymmetric closure, which crossed the midline, showing a significantly lower recurrence rate in the

asymmetric closure group.

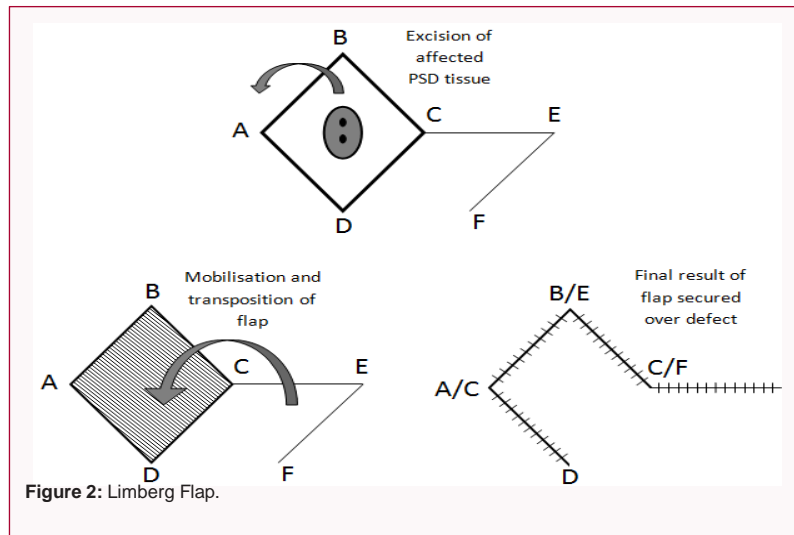


Figure 2: Limberg flap

Flap closure

The Karydakias flap is the most common flap technique for closing defects after surgical excision of sacral pressure sores (PSD) in the UK, followed by the Limberg flap (5%). The Karydakias flap consists of a paramedian elliptical incision incorporating affected PSD tissue with the final suture line lateral to the midline. The Limberg flap, named after its early 20th century inventor, Prof. Aleksandr Limberg of Leningrad, is a rhomboid transposition flap first published as a treatment for PSD by Azab et al. It has been used in PSD patients with reported lower recurrence rates and shorter hospital stays compared to primary closure. Variations of the Limberg flap have been described, such as the modified Limberg flap (lateralisation of the inferior apex), a superiorly based Limberg flap, or an oval head rhomboid flap to improve viability.

A meta-analysis comparing primary closure and the Limberg flap in 2010 found significantly lower rates of dehiscence, infection, and recurrence for the latter and concluded that the Limberg flap should be used for elective treatment of primary PSD. However, further trials not included in that meta-analysis have had varying conclusions. A prospective randomized controlled trial compared the Limberg flap with the Karydakias flap and showed that the Limberg flap had a lower complication rate, a shorter length of hospital stay but no difference in recurrence rate. A multicentre prospective randomized controlled trial in 2010 compared the modified Limberg flap against the Karydakias flap, showing that both techniques had similar

outcomes except with laterally situated openings/pits where the Karydakis flap had limited applicability.

The V-Y advancement flap seems to be the next most common flap technique after the Limberg flap and is a third option in closing defects after surgical excision of PSD. This technique was previously used to close sacral pressure sores and offers the advantage of flattening the deep natal cleft groove. A randomized controlled trial comparing V-Y advancement flap over primary closure did not show any significant advantage in terms of SSI, dehiscence, or recurrence. Other flap-based but less commonly used options include a parasacral perforator-based flap elliptical island flap, a bilobed fasciocutaneous flap, an elliptical rotation flap, or a lateral advancement flap with Burow's triangles.

Adjuncts to surgery

Post-operative infection is a concern in surgical treatment of Post-Patient Syndrome (PSS), but it has not been suggested as a risk factor for recurrence. A systematic review of 12 trials involving 1,172 patients found no benefit with single dose prophylactic or long course antibiotics in promoting healing, reducing SSI, or reducing recurrence rates. However, higher grade evidence is needed for a firm conclusion. Tritapepe and Di Padova reported good results with antiseptic flushing and drainage after excision and primary closure for PSD, with no recurrences reported. A meta-analysis of 8 studies involving 1,252 patients found no significant improvement in post-operative infection or recurrence rates, although drains did show a trend towards improvement. A systematic review on Negative Pressure Wound Therapy (NPWT) identified only 5 suitable studies suggesting it is a viable adjunct to surgery for chronic PSD. However, the lack of randomized controlled trials hampers the recommendation of NPWT in closing wounds following surgery for chronic PSD.

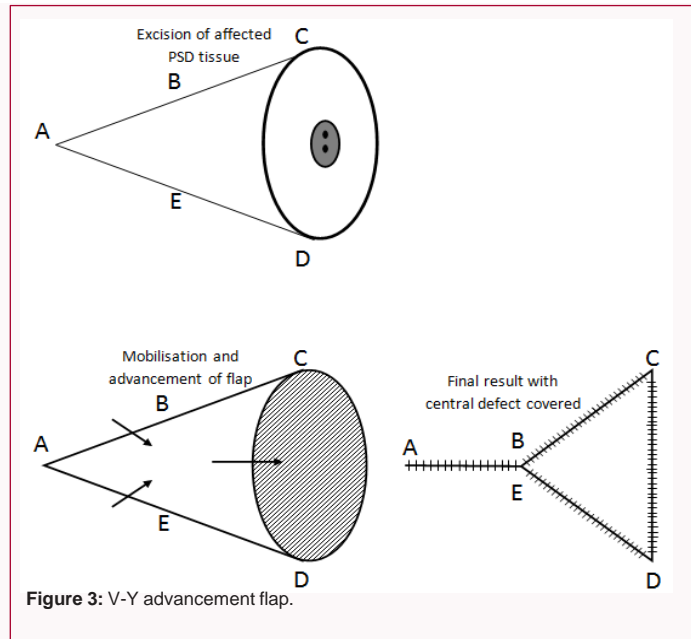


Figure 3: V-Y advancement flap

Less well-established treatments

Fibrin has been used in the treatment of Seromatic Sinusitis (PSD), but two systematic reviews have shown no benefit in preventing seroma formation after surgery or reducing recurrence rates after sealing sinus tracts. Phenol is an alternative treatment option, but a study by Kayaalp and Aydin concluded that despite its low morbidity, there was insufficient high-grade evidence to recommend its use in place of surgery in PSD. A small randomized trial compared radiofrequency sinus excision to excision and marsupialisation for PSD, finding that radiofrequency excision caused less morbidity and post-operative pain. A minimally invasive technique for PSD has been reported with the use of a fistuloscope and destruction of fistula tracts under direct vision. A case series of 27 patients showed only one recurrence after a year of follow-up. Other less invasive treatment options include cryosurgery combined with incision of PSD sinuses, which has the advantages of needing only local anesthetic, improved healing rates, lack of haemorrhage, and simplicity of use. Laser depilation has also been described to treat recurrent disease by removing hairs in the natal cleft, causing epithelial disruption and an inflammatory reaction.

Conclusion

The difficulty in interpreting studies on PSD has been the lack of an agreed or widely used classification or grading system for the severity of the condition. This has repeatedly been acknowledged in meta-analyses or systematic reviews concerning PSD [80]. A staging system with corresponding treatment recommendation has been recently proposed [81]. Whilst this is a step in the right direction, the problem is that such a system would have to be widely adopted, recognized in order to facilitate research, communication and meaningful comparisons amongst the many treatment modalities. Pilonidal sinus disease is best managed by specialists with an interest in the disease such as a colorectal or plastic surgeon experienced in treating recurrent cases. Emergency treatment should primarily consist of off-midline incision and drainage with subsequent referral to a specialist should the condition recur. There is no standard or recommended elective treatment for PSD but evidence suggests that there is no one perfect technique to address all the variables involved (e.g. secondary healing may have a lower recurrence rate but a longer time to healing and flap-based options require in-patient care as opposed to day surgery for primary excision and closure).

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