

PROCEEDINGS

SURGICAL TREATMENT OF CHRONIC PILONIDAL DISEASE

Elmira Daskalova, Slavimir Lavchev, Danko Penchev, Bogomil Borisov, Ismail Crunkov,
Mustafa Barzev, Kiril Draganov

*Clinic of Hepatobiliary, Pancreatic and General Surgery, Acibadem City Clinic Tokuda
University Hospital, Sofia, Bulgaria*

ABSTRACT

INTRODUCTION: Pilonidal disease is a relatively common surgical disease affecting mainly young men aged 15–35 years (almost 4 times more than women) and with a tendency to increase its prevalence in the last two decades, including also among women. Although many surgical treatment methods have been described, the rate of recurrence and complications related to wound healing remain relatively high (17.5% and 11.6%, respectively, according to literature data) and worsen the quality of life of the patients for a long period of time.

MATERIAL AND METHODS: For a 10-year period, from 2012 to 2022, 235 patients with an average age of 42.1 years were operated on for a pilonidal cyst in the Clinic for Hepatobiliary, Pancreatic and General Surgery of Acibadem City Clinic Hospital Tokuda. In 37.4% of them, surgical treatment was due to recurrence.

RESULTS: In all patients, after verification of the fistula course(s) with methylene blue and/or a ball probe, a sheet-like excision of the formation was performed. In 24 of the cases (10.2%), transposition with a Limberg flap followed; 118 patients (50.2%) were treated according to the so-called open method, and in 93 patients the resulting defect was closed primarily with imposed drainage.

CONCLUSION: The ideal therapeutic approach should provide a short recovery period with the possibility of a quick return to normal daily life. Currently there is no consensus on the best operative technique.

Keywords: *pilar/pilonidal cyst, Limberg flap, sacrococcygeal pilonidal cyst disease*

INTRODUCTION

Pilonidal disease is a relatively common surgical disease affecting mainly young men aged 15–35 years (almost 4 times more than women) and with a tendency of an increase in the prevalence in the last two decades (according to WHO data for 2015, the reported approximate frequency is 26 per 100,000 people), incl. in women.

The pilar cyst occurs in the hair follicles and is characterized by a subcutaneous infection of the sacrococcygeal region. This, in turn, is associated with chronic discharge, pain, and discomfort that adversely affect the patients' quality of life and social function.

The ideal treatment should result in a cure with a rapid recovery period allowing return to normal daily activities, with a low level of associated morbidity. Although surgery is the gold standard in the treatment of pilonidal disease and various surgical techniques have been described, some with significantly better results, the complications of surgery often remain worse than the underlying disease. Thus, the rate of relapses and complications related to wound healing are relatively high (on average, according to literature data, 17.5% and 11.6%, respec-

Address for correspondence:

Elmira Daskalova
Acibadem City Clinic Tokuda University Hospital
51B Nikola Vaptsarov Blvd
1407 Sofia
Bulgaria
e-mail: daskalova.elmira@gmail.com

Received: July 4, 2023

Accepted: September 15, 2023



tively) and worsen the patients' quality of life for a long period of time.

AIM

The aim of the present study is to compare the obtained results and to analyze the own institutional experience in the surgical treatment of pilonidal disease, involving excision with primary closure, transposition with Limberg flap, and the so-called open method.

MATERIALS AND METHODS

For a 10-year period, from 2012 to 2022, 235 patients with an average age of 42.1 years were operated on for a pilonidal cyst in the Clinic for Hepatobiliary, Pancreatic and General Surgery of ACC UMBAL Tokuda (Fig. 1).

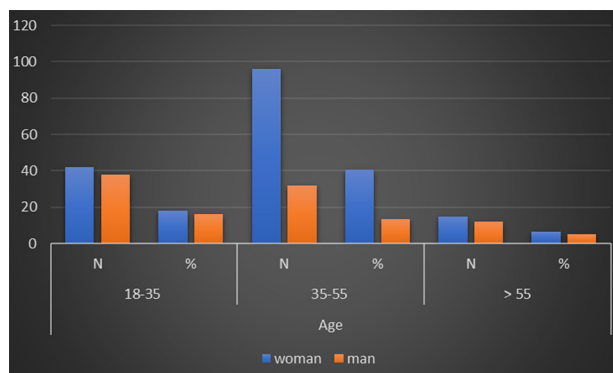


Fig. 1. Patients—age and gender.

All operated patients received perioperative antibiotic therapy, and 89.2% of them were prescribed an oral antibiotic to take at home.

Intraoperatively, all patients were placed prone on the operating table with the glutes in a distant position in order to better visualize the operative field. This is followed by verification of the fistula course(s) with methylene blue and/or a ball probe (in 15% of

the patients, pre-operative MRI was performed, and in 4.6%—fistulography to refine the diagnosis and optimize the surgical approach). In 24 patients (10.2%) a rhomboid excision was performed with subsequent reconstruction with a Limberg flap according to the original technique with an imposed Redon drain. In all other cases, maximally sparing sheet-like excision was performed deep to the fascia with subsequent hemostasis and lavage with oxygenated water and Brownol. In 93 patients (39.6%) the resulting defect was closed primarily, and in the remaining 118 patients (50.2%)—it was left open (Table 1).

In 147 patients, the operation was necessary due to primary complaints, and in 88 cases (37.4%)—due to recurrence after surgical intervention in another hospital (Fig. 2) with an average hospital stay of 2 days.

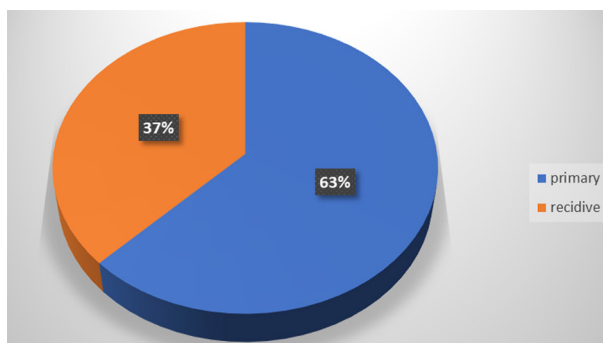


Fig. 2. Indication for surgical treatment.

RESULTS

Complications were registered in 111 (47.2%) patients (Fig. 3), presented in Table 2, the most frequent of which was the occurrence of a relapse—16.5% (this does not include the cases of primary recurrence, in which patients were initially operated on in another hospital). This result is fully comparable to the average pilonidal disease recurrence rate of 17.5% re-

Table 1. Type of surgical technique.

Operational Type		N	%
Open method		118	50.2
Primary closure	Redon drain	48	20.4
	Another drain type	36	15.4
	Without a drain	9	3.8
Limberg flap		24	10.2

ported in the specialized literature (1–4), noting that the patient does not always return to the same surgeon/surgical clinic after the occurrence of any complication.

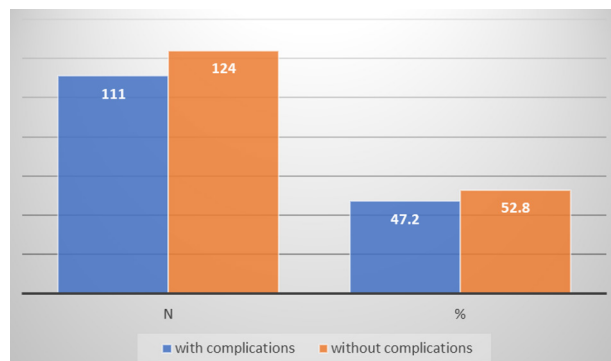


Fig. 3. Complications.

complications, to minimize the costs of treatment, including and reducing the number of post-operative dressings required, faster recovery, and rapid return to work (2–7).

The main surgical treatment options include excision with primary closure with variable width, secondary healing, and minimally invasive surgery. According to the current National Guideline of the German Surgical Society from 2020, excision is the standard treatment for chronic pilonidal disease (8–10). Wide excision and open treatment of chronic disease is a safe procedure, but results in prolonged secondary healing and time off work, as well as a significant recurrence rate. The diameter of what is removed should be as limited as possible. Minimally invasive procedures are an option for treating small, primary pilar cysts. However, their relapse rate is

Table 2. Types of complications.

	Open Method	Primary Closure	Limberg Flap
Wound dehiscence	0	16	2
Wound healing > 3 months	15	9	1
Seroma	0	14	1
Hematoma	1	1	0
Suppuration	9	3	0
Relapse	11	26	2

As can be seen from the presented results, recurrence is most often registered with primary closure along the midline—66.6% with 28.2% for the open method and 5.2% in the cases of Limberg plasty. Regarding other possible complications, they are again the least frequently registered when using a Limberg flap to restore the resulting defect.

DISCUSSION

The operative approach to the treatment of pilonidal disease has changed significantly in the last decade with the introduction of new surgical techniques and technological innovations (1). However, the high risk of recurrence along with local complications of the wound—dehiscence, seroma or hematoma formation, infection (suppuration) and persistent pain, remain a problem. Thus, the main goal is the introduction of effective intervention strategies in order to reduce the rate of the above-described

higher. In the case of primary closure of the resulting defect (when minimally invasive treatment is not suitable), this must be done away from the midline, as the two most commonly used reconstructive techniques offer—the Limberg flap and the Karydakis procedure (11–13).

Numerous studies and comparative analyses have been conducted regarding the postoperative outcomes of open treatment and primary closure after excision of a pilonidal cyst, although a consensus is still lacking (12–14). According to literature, faster healing is expected after primary closure, but with a higher risk of recurrence. In the specialized reports on the subject, there is no significant difference for the two groups regarding the rate of wound infection, other complications (dehiscence, postoperative fever, postoperative wound discharge), and length of hospital stay (15,16).

There is near-unanimity in the literature that midline closure should become the standard treatment for pilonidal sinus when primary closure is the preferred surgical option because of the proven benefits of faster healing, lower rates of infection, recurrences and other complications of non-midline closure techniques (17–20). In this way, rhomboid excision and Limberg flap closure (including the proposed variations and modifications) in the treatment of sacrococcygeal pilonidal sinus, especially in recurrent cases and in patients with extensive involvement, may provide a lower risk of recurrence, a shorter hospital stay, faster return to a normal rhythm of life with a well-executed surgical technique, which in turn outweighs the disadvantages associated with an unfavorable cosmetic appearance (12,13,21–24).

Less invasive procedures (including Gips technique, laser-assisted sinus closure (SiLaC), de-epithelialization technique, use of photosensitive hydrogels, etc.) are gaining more and more popularity and are gradually becoming the first choice of surgical treatment with reported very good results regarding the early postoperative period with acceptable cosmetic effect and recurrence rate (13–16,25,26). It should be noted that the specialized literature currently lacks large studies tracking and analyzing the data collected so far. Moreover, the presented results are from single-center studies with a strong selection of cases and patients, and even the authors themselves are not committed to a wide application of the proposed methods in cases of recurrent pilonidal disease.

The literature is ambiguous regarding patient satisfaction, treatment costs, and temporary disability. According to these indicators, there is no ideal technique of treatment, and better results are directly related to complications and recovery time (29–31).

CONCLUSION

Pilonidal disease is a common disease, causing prolonged discomfort and pain and in some cases prolonged disability and social isolation of patients. Currently, there is no consensus on the best surgical therapy, as even the results from different researchers using the same method of surgery are contradictory. The choice of a surgical method for the treatment of a pilar cyst is based on an individualized approach, which depends, on the one hand, on the personal experience and preferences of the surgeon (in

accordance with the basic principles of good medical practice), and, on the other hand, on the overall assessment of the general status, comorbidity, the patient's desire and ability to actively participate in the treatment process.

REFERENCES

1. Kapp T, Zadnikar M, Hahnloser D, Soll Ch, Hetzer FH. Neues Therapiekonzept für den Sinus pilonidalis [New concept in the treatment of the pilonidal sinus]. *Praxis (Bern)* 1994. 2007;96(31-32):1171-6. German. doi: 10.1024/1661-8157.96.31.1171.
2. Harries RL, Alqallaf A, Torkington J, Harding KG. Management of sacrococcygeal pilonidal sinus disease. *Int Wound J*. 2019;16(2):370-378. doi: 10.1111/iwj.13042.
3. Fu C, Deng Y, Liu M. Limberg flap for recurrent pilonidal sinus. *Dis Colon Rectum*. 2023;66(6):e298. doi: 10.1097/DCR.0000000000002515.
4. Dahmann S, Lebo PB, Meyer-Marcotty MV. Therapievergleich bei infiziertem Sinus pilonidalis - Unterschiede von Narbenqualität und Outcome nach Sekundärheilung oder Limbergglappenplastik im Rahmen einer prospektiven Studie [Comparison of Treatments for an Infected Pilonidal Sinus: Differences in Scar Quality and Outcome Between Secondary Wound Healing and Limberg Flap in a Prospective Study]. *Handchir Mikrochir Plast Chir*. 2016;48(2):111-9. German. doi: 10.1055/s-0041-111322.
5. Käser SA, Zengaffinen R, Uhlmann M, Glaser C, Maurer CA. Primary wound closure with a Limberg flap vs. secondary wound healing after excision of a pilonidal sinus: a multicentre randomised controlled study. *Int J Colorectal Dis*. 2015;30(1):97-103. doi: 10.1007/s00384-014-2057-x.
6. Segre D. What You Should Remember in Managing Pilonidal Disease. *Front Surg*. 2021;8:792121. doi: 10.3389/fsurg.2021.792121.
7. Shetty R, Payne R. The Limberg flap in sacrococcygeal pilonidal sinus disease. *Br J Hosp Med (Lond)*. 2010;71(9):511-3. doi: 10.12968/hmed.2010.71.9.78162.
8. Ardel M, Dittmar Y, Rauchfuss F, Fahrner R, Scheuerlein H, Settmacher U. Klassische Rautenplastik nach Limberg zur Behandlung einer sakrokokzygealen Pilonidalsinuserkrankung - Erklärung der OP-Technik [Classic Limberg Flap Procedure for Treatment of a Sacrococcygeal Pilonidal Sinus Disease - Explanation of the Surgical Tech-

- nique]. *Zentralbl Chir.* 2015;140(5):473-5. German. doi: 10.1055/s-0035-1557760.
9. Lamdark T, Vuille-Dit-Bille RN, Bielicki IN, Guglielmetti LC, Choudhury RA, Peters N, Doll D, Luedi MM, Adamina M. Treatment Strategies for Pilonidal Sinus Disease in Switzerland and Austria. *Medicina (Kaunas)*. 2020;56(7):341. doi: 10.3390/medicina56070341.
 10. Iesalnieks I, Ommer A, Herold A, Doll D. German National Guideline on the management of pilonidal disease: update 2020. *Langenbecks Arch Surg.* 2021;406(8):2569-80. doi: 10.1007/s00423-020-02060-1.
 11. Popeskou SG, Pravini B, Panteleimonitis S, Vajana AFDT, Vanoni A, Schmalzbauer M, Posabella A, Christoforidis D. Conservative Sinusectomy vs. excision and primary off-midline closure for pilonidal disease: a randomized controlled trial. *Int J Colorectal Dis.* 2020;35(7):1193-9. doi: 10.1007/s00384-020-03551-9.
 12. Stauffer VK, Luedi MM, Kauf P, Schmid M, Diekmann M, Wieferich K, Schnüriger B, Doll D. Common surgical procedures in pilonidal sinus disease: A meta-analysis, merged data analysis, and comprehensive study on recurrence. *Sci Rep.* 2018;8(1):3058. doi: 10.1038/s41598-018-20143-4.
 13. Wu P, Zhang Y, Zhang Y, Wang S, Fan Z. Progress in the surgical treatment of sacrococcygeal pilonidal sinus: a review. *Int J Surg.* 2023;109(8):2388-403. doi: 10.1097/JS9.0000000000000447.
 14. Kose E, Hasbahceci M, Tonyali H, Karagulle M. Comparative analysis of the same technique-the same surgeon approach in the surgical treatment of pilonidal sinus disease: a retrospective cohort study. *Ann Surg Treat Res.* 2017;93(2):82-7. doi: 10.4174/ast.2017.93.2.82..
 15. Demiryas S, Donmez T. Could Early Postoperative Complications be Considered as Risk Factor for Recurrence after Pilonidal Sinus Surgery? *Chirurgia (Bucur)*. 2019;114(4):475-86. doi: 10.21614/chirurgia.114.4.475.
 16. Rashidian N, Vahedian-Ardakani J, Baghai-Wadji M, Keramati MR, Saraee A, Ansari K, Adman AA. How to repair the surgical defect after excision of sacrococcygeal pilonidal sinus: a dilemma. *J Wound Care.* 2014;23(12):630-3. doi: 10.12968/jowc.2014.23.12.630.
 17. Eryilmaz R, Sahin M, Alimoglu O, Dasiran F. Surgical treatment of sacrococcygeal pilonidal sinus with the Limberg transposition flap. *Surgery.* 2003;134(5):745-9. doi: 10.1016/s0039-6060(03)00163-6.
 18. Horesh N, Meiri H, Anteby R, Zager Y, Maman R, Carter D, et al. Outcomes of laser-assisted closure (SiLaC) surgery for chronic pilonidal sinus disease. *J Laparoendosc Adv Surg Tech A.* 2023;33(6):556-60. doi: 10.1089/lap.2022.0567.
 19. Yang Y, Yang H, Han Y, Wang Z, Han C. Photocrosslinking hydrogel for wound healing in a pilonidal sinus patient after open surgery. *J Surg Case Rep.* 2023;2023(5):rjad152. doi: 10.1093/jscr/rjad152.
 20. McCallum I, King PM, Bruce J. Healing by primary versus secondary intention after surgical treatment for pilonidal sinus. *Cochrane Database Syst Rev.* 2007;(4):CD006213. doi: 10.1002/14651858.CD006213.pub2.
 21. Bi S, Sun K, Chen S, Gu J. Surgical procedures in the pilonidal sinus disease: a systematic review and network meta-analysis. *Sci Rep.* 2020;10(1):13720. doi: 10.1038/s41598-020-70641-7.
 22. Palmieri I, D'Amata G, Picchio M, Greco E, Tintisona O, Cefaro A. Pilonidal sinus disease. A single center retrospective series analysis. *Ann Ital Chir.* 2023;94:90-4.
 23. Jarrett F. Operation for pilonidal sinus: Still debated. *Am J Surg.* 2022;223(4):827-8. doi: 10.1016/j.amjsurg.2021.09.010.
 24. Shabbir F, Ayyaz M, Farooka MW, Toor AA, Sarwar H, Malik AA. Modified Limberg's flap versus primary closure for treatment of pilonidal sinus disease: a comparative study. *J Pak Med Assoc.* 2014;64(11):1270-3.
 25. Darwish AM, Hassanin A. Reconstruction following excision of sacrococcygeal pilonidal sinus with a perforator-based fasciocutaneous Limberg flap. *J Plast Reconstr Aesthet Surg.* 2010;63(7):1176-80. doi: 10.1016/j.bjps.2009.05.051.
 26. Koskinen K, Harju J, Hermunen K. Long-term results for pit-picking and flap procedures in primary pilonidal sinus disease. *BMC Surg.* 2023;23(1):99. doi: 10.1186/s12893-023-02014-6.
 27. Ehrl D, Choplain C, Heidekrueger P, Erne HC, Rau HG, Broer PN. Treatment options for pilonidal disease. *Am Surg.* 2017;83(5):453-7.
 28. Dandin Ö, Tihan D, Karakaş DÖ, Hazer B, Balta AZ, Aydın OU. A new surgical approach for pilonidal sinus disease: "de-epithelialization tech-

- nique”. *Turk J Surg.* 2018;34(1):43-8. doi: 10.5152/UCD.2016.3632.
29. Özcan B, İlkgül Ö. Contralateral Limberg flap reconstruction for pilonidal disease recurrence. *Asian J Surg.* 2019;42(8):787-91. doi: 10.1016/j.asjsur.2018.12.008.
30. Kumar M, Clay WH, Lee MJ, Brown SR, Hind D. A mapping review of sacrococcygeal pilonidal sinus disease. *Tech Coloproctol.* 2021;25(6):675-82. doi: 10.1007/s10151-021-02432-9.
31. Enriquez-Navascues JM, Emparanza JI, Alkorta M, Placer C. Meta-analysis of randomized controlled trials comparing different techniques with primary closure for chronic pilonidal sinus. *Tech Coloproctol.* 2014;18(10):863-72. doi: 10.1007/s10151-014-1149-5.