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ORIGINAL ARTICLE

Results of surgical treatment of pilonidal sinus in 50 patients operated using Bascom II procedure – prospective study

Authors' Contribution:
A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

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ABSTRACT:

Introduction: Treatment of the pilonidal sinus, due to various surgical methods, remains the current topic of discussion during surgeon meetings worldwide. The newest methods of treatment consist in the excision and simultaneous closure of the wound with cleft lift procedures. One of such methods is Bascom II procedure which has been widely used in the world but is less popular in Poland.

Aim of the study: To evaluate the results of treatment of pilonidal cysts using Bascom II procedure performed by one operator.

Material and method: 50 patients (40 men, 10 women), Avg. 30.6 years of age. All patients treated with Bascom II procedure in one surgical ward by one operator (resident during specialisation training) with the use of uniform surgical care for all operational protocols. The following were assessed: BMI, average hospitalisation time, pain, post-operative complications, wound healing time, patient's quality of life, and the recurrences rate after surgery. The follow-up period ranged from 12 to 52 months.

Results: Average BMI 27.13 kg/m^2. Avg. time of hospitalisation 2.95 days. Post-operative pain in the first 24 hours was on average 4.55 points. (+/- 2.24 points); on the 10th day on average 2.04 points (+/- 1.58 points); in the 30th day on average 0.76 points (+/- 1.1 points). Pain after healing 0.14 points (+/- 0.40 points). Post-operative complications occurred in 28.57% of patients [partial wound dehiscence (16.32%), serum leak (10.2%), hematoma (6.12%), total wound dehiscence (0%), wound infection (0%)]. The average time of full healing was 2.94 weeks. Recurrence occurred in one patient (2.04%).

Conclusions: Bascom II procedure is characterised by a low recurrence rate and short wound healing time. It is a a safe, effective and patient-accepted method of treatment. Statistically, it significantly improves the patient's quality of life one year after surgery in terms of both physical and mental health.

KEYWORDS: Bascom II procedure, pilonidal sinus

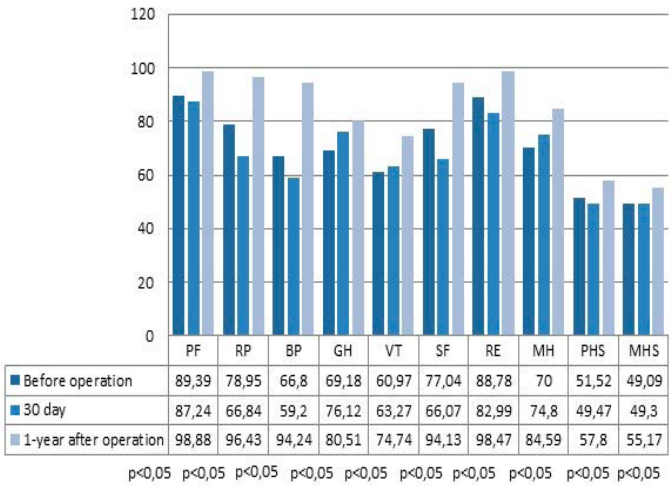
ABBREVIATIONS

BP – pain complaints
EPSiT – endoscopic pilonidal sinus treatment
GH – general sense of health
MH – mental health
MHS – mental health
PF – physical function
PHS – physical health
RE – limitation in performing roles resulting from emotional problems
RP – limitation in performing roles due to physical health
SF – social functioning
VT – vitality

INTRODUCTION

The first reports of the pilonidal sinus come from the beginning of the 19th century. In 1833, the British physician Herbert Mayo [1, 2] described the disease, while the term "pilonidal" was used by the American surgeon Richard Manning Hodges (fifty years later). The term "pilonidal" comes from the Latin words *pilus* (hair) and *nidus* (nest) and was used to describe the disease as resembling a hair's nest. A pilonidal sinus occurs in about 0.7% of the population [4], more often in men. It is an acquired, chronic, inflammatory disease of the skin and subcutaneous tissue, occurring mainly in the sacrococcygeal region [5, 6]. Despite the rapid development of diagnostic and therapeutic techniques, treatment of pilonidal sinus, due to the various available options in the choice of surgery method, remains the current topic of discussion during surgeons' meetings worldwide [7]. A multitude of operating procedures and methods of treatment determine the complexity of the problem. There is no one effective solution of management. In the case of small cysts, a minimally invasive technique using laser [8], EPSiT [9] or the use of tissue glue [10] may be used.

Over the years, various methods of treating this disease have been tested. Historical surgical techniques were based only on the treatment of symptoms. Lack of removal of the cause of disease resulted in a high, over 30% rate of relapse after this type of surgery [11]. The latest methods are based on causative therapy, resulting in lower recurrences. They consist in the excision and simultaneous closure of the wound in connection with cleft lift procedure, resulting in a smaller number of recurrences not exceeding 10% [12] and a shorter healing time of the surgical wound. One of such methods, the Bascom II procedure is widely used in the world, and less popular in Poland. It involves the excision of pilonidal sinus in its entirety and closure of the wound with an arched shift of gluteal cleft beyond the midline of the body. Both the results of the operation and the good cosmetic effect of the scar have contributed to the quick rise of popularity of this method in the world, but in



	PF	RP	BP	GH	VT	SF	RE	MH	PHS	MHS
Before operation	89,39	78,95	66,8	69,18	60,97	77,04	88,78	70	51,52	49,09
30 day	87,24	66,84	59,2	76,12	63,27	66,07	82,99	74,8	49,47	49,3
1-year after operation	98,88	96,43	94,24	80,51	74,74	94,13	98,47	84,59	57,8	55,17
	p<0,05	p<0,05	p<0,05	p<0,05	p<0,05	p<0,05	p<0,05	p<0,05	p<0,05	p<0,05

Fig. 1. Results of quality of life assessment after Bascom II.

Poland, there are few reports on this method. The difference between the applied perioperative protocols and surgical technique in performing the same operation in various departments treating patients with pilonidal sinus has prompted the authors to standardise the procedure and conduct examination in one surgical centre with the performance of operations only by one operator.

OBJECTIVE

Evaluation of the results of treatment of pilonidal cysts using Bascom II procedure operated by one operator of the Surgical Ward of the District Hospital in Wolomin.

MATERIAL AND METHOD

The study involved 50 patients (40 men and 10 women), aged 19 to 45 years (mean age 30.6 years). 49 patients applied for all follow-up visits with the last follow-up one year after surgery (which accounted for 98% of patients admitted to the study). Approval of the Bioethical v at the Regional Medical Chamber in Warsaw was obtained. The following inclusion criteria were determined: 18 years of age, primary pilonidal sinus, no current abscess in the sinus. The first patient was included in the study in June 2014, the last in July 2017. The minimum follow-up period was 12 months. The total follow-up period of patients treated using Bascom II procedure (broad follow-up) ranged from 12 to 52 months. The following parameters were assessed: length of hospitalisation, post-operative complications, post-operative wound healing time, pain on the first post-operative day and after healing of the wound, patient's quality of life before Bascom II procedure and after the treatment, recurrence rate after surgery. A 10-degree visual VAS scale (Visual Analog Scale) was used to assess the degree of pain intensity. The Polish version of the SF-36 quality of life questionnaire (Quality of Life 36-Item Short Form Survey) was used to assess the quality of life. The authors of the study obtained approval and a license for non-commercial use of the questionnaire in order to assess the quality of life of patients participating in the clinical trial. All patients participating in the study were operated by the same operator (during the study he was a resident during specialisation training). The operational team included an operator and at least one assistant. The form of anaesthesia preferred by the anaesthetic team was spinal anaesthesia. All patients received pre-medication in the form of intravenous Cefazolin administration in a single bolus within 0–30 minutes before skin incision. The dose was dependent on body weight and was 1 g for body weight >80 kg and 2 g for body weight> 80 kg [13]. One analgesic regimen was used in all patients participating in the clinical trial in the form of intramuscular administration of 100 mg ketoprofen 6h after surgery, followed by oral administration of ketoprofen twice daily after 100 mg. One-way analysis of variance (ANOVA) for independent groups was used for statistical analysis.

RESULTS

The BMI of the patients ranged from 19.05 kg/m^2 to 39.25 kg/m^2 (avg. BMI 27.13 kg/m^2). Duration of the disease determined in months ranged from 4 months to 240 months (avg. 36.12 months). The length of hospital stay ranged from 2 to 3 days (avg. 2.95 days) (Tab. I.).

Post-operative pain felt by patients treated with Bascom II procedure, assessed on the first post-operative day was on average 4.55 points (+/- 2.24 points); on the 10th post-operative day it averaged 2.04 points (+/- 1.58 points); on the 30th post-operative day it was on average 0.76 points (+/- 1.1 points). Pain experienced by patients, evaluated after healing of the surgical wound, was on average 0.14 points (+/- 0.40 points). Post-operative complications occurred in a total of 14 patients, which amounts to 28.57% of all patients. The most common post-operative complication was partial dehiscence of the surgical wound which occurred in 8 patients (16.32%). Five patients (10.2%) had serous leaking. A complication in the form of hematoma in the wound was noted in 3 patients (6.12%). None of the patients had a complete surgical dehiscence (0%). None of the patients had an infection of the surgical wound (0%). Two patients underwent numerous post-operative complications in the form of simultaneous occurrence of: serous leakage + partial dehiscence of the surgical wound and hematoma + partial dehiscence of the surgical wound.

The time of full healing of the surgical wound of patients treated with Bascom II procedure ranged from 1.5 weeks to 19 weeks (mean 2.94 weeks). Recurrence of the disease occurred in one patient treated with Bascom II procedure (2.04%). The time elapsed from surgery to relapse was 36 weeks. All patients accepted the final cosmetic appearance of the post-operative scar and the final outcome of treatment. Perioperative and post-operative mortality was 0%. All subjects would recommend the treatment of pilonidal cyst using Bascom II procedure (100%) to other patients. The above results are presented in Tab. II.

The following results were obtained for assessing the quality of life of patients treated with Bascom II procedure. Regarding the aspects of quality of life:

- PF: before surgery, on average 89.39 (+/- 13.76). On the 30th post-operative day it was on average 87.24 (+/- 15.8). After one year from surgery, it amounted to an average of 98.88 (+/- 3.85);
- RP: before surgery it was on average 78.95 (+/- 22.88). On the 30th post-operative day it was on average 66.84 (+/- 29.6). After one year from surgery, it amounted to an average of 96.43 (+/- 11.34);

- BP: on average it was 66.8 (+/- 25.6) before surgery. On the 30th post-operative day, it was on average 59.2 (+/- 21.29). After one year from surgery, it amounted to an average of 94.24 (+/- 12.69);
- GH: an average of 69.18 (+/- 16.82) before surgery. On the 30th post-operative day, it was on average 76.12 (+/- 15.3). After one year from surgery, it was on average 80.51 (+/- 13.68);
- VT: before surgery it was on average 60.97 (+/- 17.61). On the 30th day after surgery, it was on average 63.27 (+/- 18.07). One year after surgery, it was 74.74 on average (+/- 13.13);
- SF: before surgery it was on average 77.04 (+/- 23.15). On the 30th day after surgery, it was on average 66.07 (+/- 25.26). After one year from surgery, it amounted to an average of 94.13 (+/- 13.53);
- RE: before the operation it amounted to an average of 88.78 (+/- 15.64). On the 30th day after surgery, it was on average 82.99 (+/- 22.31). After one year from surgery, it amounted to an average of 98.47 (+/- 4.05);
- MH: before surgery it was on average 70.0 (+/- 14.93). On the 30th post-operative day it was on average 74.8 (+/- 15.88). After one year from surgery, it was on average 84.59 (+/- 11.49).

According to the aggregate domains:

- PHS: before surgery it was on average 51.52 (+/- 7.86). On the 30th day after surgery, it was on average 49.47 (+/- 6.81). One year after surgery, it was 57.8 (+/- 3.77) on average;
- MHS: an average of 49.09 before surgery (+/- 7.56). On the 30th post-operative day, it was 49.3 (+/- 8.56) on average. One year after surgery, it was on average 55.17 (+/- 4.43).

The above results are presented in Fig. 1.

Tab. I. Characteristics of patients treated with Bascom II procedure.

Age (years)	30.58 (19–54)
Gender:	
Men	40 (80%)
Women	10 (20%)
BMI (kg/m^2)	27.14
Duration of illness (months)	36.12 (4–240)
Hospitalisation (days)	2.95 (2–3)

Tab. II. Results of patients treated with Bascom II procedure.

Post-operative pain:	
day 1 (1–10)	4.55 +/- 2.24
day 10 (1–10)	2.04 +/- 1.58
day 30 (1–10)	0.76 +/- 1.1
Complications:	
Number of patients with complications	14 (28.6%)
Hematoma	3 (6.1%)
Leaking from wound	5 (10.2%)
Complete wound dehiscence	0 (0.0%)
Partial dehiscence of wound	6 (8) (16.3%)
Wound infection	0 (0.0%)
Time to full healing	2.94 tyg. (1.5–19)
Recurrence (%)	1 (2.04%)
Recommendation of method	100%
Mortality	0%

DISCUSSION

The operated group was predominated by men (80%), mainly young people in the second and third decade of life. The age structure and gender of the studied group was common to similar studies carried out and published by other researchers [14, 15, 16, 17]. The majority of respondents were overweight patients. In the study group no illnesses were reported in underweight people. Similar observations can be found in numerous publications concerning the cause of pilonidal sinus, which confirms the thesis that a deep gluteal cleft associated with obesity promotes the disease [18, 19]. In the analysed group of patients treated with Bascom II procedure, the mean duration of the disease was 36 months. In the available literature, most authors state that the average duration of the disease in treated patients was usually around one year [14, 15, 20]. The above discrepancy may be related to a different organisation of healthcare in the countries cited in the literature (Turkey, Egypt). The above data confirm, however, that a chronic, multimodal inflammatory process causes the disease. Clinical observation showed that the duration of the disease affects the size of the cyst. With the growth of the cyst, a wider excision and a larger range of operations are necessary. In the surgical ward, in which the study was conducted for organisational reasons, the standard of perioperative care is the commencement of hospitalisation on the day before surgery, however, several patients were operated on the day of admission to the ward. In the absence of complications, patients were discharged on the first post-operative day. This shortened the time of hospitalisation to 2 days and did not affect the quality of the operation or the number of complications. In the study group no patient required repeated admission to the hospital due to post-operative complications. Bascom II procedure does not require any specialist preparation the day before surgery. Therefore, it is possible to decrease the total stay of the patient in the ward up to one day using one-day stay procedures. Researchers from England confirm the benefits of one day surgery and pay attention to the 4-fold lower hospital stay costs as part of the one-day procedure, comparing hospitalisation costs with a 3-day stay (£ 672 vs £ 2,405) [21]. Research carried out in Poland confirms the safety of the method and the possibility of a faster discharge of the patient. Surgery of pilonidal sinus within the one-day procedure can therefore be used and it is worth considering if the surgical ward has developed procedures for one-day hospitalisation. An inseparable element of the operation is post-operative pain, which often affects the type of treatment chosen by patients, as well as the course of post-operative period [22, 23]. The greatest pain reported by patients was on the first post-operative day (on average 4.55 on a scale of 0–10 points) and decreased as the surgical wound healed reaching the lowest value after healing of the surgical wound (mean 0.14 on the 0–10-point scale). The degree of post-operative pain intensity was consistent with the reports of other authors [14, 15, 20]. In order to improve post-operative comfort and reduce pain sensation on the first post-operative day, the inclusion of additional pain-related medications going beyond the study protocol should be considered, however none of the patients participating in the study asked for an increase in the dose of medication. After healing of the surgical wound following Bascom

II procedure, six patients reported persistent minor pain. Confronting the marked values with the clinical examination of the healed wound, it was found that the pain experienced by patients appeared after a prolonged stay in positions favouring mechanical pressure on the wound (sitting, cycling, driving for many hours). The patients claimed that the pain did not occur in standing position. An important element affecting post-operative care is the healing time of the surgical wound. In the study, the mean time to full healing of patients operated with Bascom II procedure was 2.94 weeks. The obtained results did not differ from the results published in the world literature [14, 15]. In many publications, the healing of wounds is considered as the time of removal of sutures, but the process of the wound's shaping and formation of the final scar continues for many months. It is recognised that the processes of shaping of the post-operative scar lasts many years, but the scar in its final shape is formed up to 12 months [24, 25]. During the last follow-up visit one year after surgery, all patients treated with Bascom II procedure accepted the appearance of the scar and the final result of treatment. Similar observations were noted by other authors [12]. In the post-operative period there may occur complications of wound healing. Among the study group operated with Bascom II procedure, the most common post-operative complications were partial wound dehiscence (16.32%) and serum leakage (10.2%). None of the patients treated with Bascom II procedure who participated in the study experienced infection of the surgical wound or complete surgical wound dehiscence. Perioperative and post-operative mortality in the study was 0%. The obtained results are consistent with the most frequent complications described in the available literature [12, 14, 15].

The questionnaire of subjective assessment of the quality of life completed during the study was a tool allowing to determine the quality of life with the disease, in the post-operative period and after the end of treatment. The obtained results of the study of the quality of life should be analysed taking into account subsequent stages of the diagnostic and therapeutic process. Three stages were distinguished. The first assessment of the quality of life concerned the pre-operative period. It defines a subjective assessment of life and illness. Its result is the base value. Analysing the change in the quality of life in subsequent stages, the results of the answers received in the questionnaire were compared to the baseline value obtained before treatment commenced. The next assessed stage was the course of post-operative period, taking into account the quality of life during the wound healing process. The last stage was the assessment of the quality of life after healing of the surgical wound and curing of the disease. In all the aspects of quality of life studied, after Bascom II procedure (evaluated one year after surgery), the quality of life was improved. The results obtained show satisfaction with the performed operation and the improvement of subjectively assessed physical and mental health. The biggest differences between the baseline (life with the disease) and a year after surgery (life after healing) were obtained in the aspect of RP, BP and SF. The obtained results show that Bascom II procedure brings the greatest benefits in these aspects of quality of life. The obtained BP score (pain) after curing measured by means of subjective evaluation of the QoL questionnaire is consistent with the results described above and pain analysis using the VAS scale. The analysed material points to a significant reduction in quality of life in the post-operative period in the aspect of RP, BP, SF, RE. A better quality of life in the post-operative period was obtained in view of GH and MH. The above results indicate that despite the physical and emotional inconveniences related to the operation and the process of wound healing, the operation improves the overall sense of health and positively influences the sense of mental health in the first days after surgery. Similar analyses of patients' quality of life and a comprehensive analysis of Bascom II procedure in the Polish literature were not found. In view of the above, it is difficult to refer to the results obtained in the analysed group compared to the data of other authors. The obtained results of QoL questionnaire and their change depending on the passage of time were similar to the one mentioned in foreign literature [14]. During the last follow-up visit, all patients confirmed that they would recommend the treatment of pilonidal cyst with Bascom II procedure to other patients Another goal of pilonidal cyst surgery is to prevent recurrence. In the study evaluating Bascom II procedure, one patient required reoperation due to recurrence (2.04%). So far, the largest analysis of the relapse rate appeared in a scientific report covering 6,143 studies published from 1833 to 2017. It included reports in English, French, German, Italian, Spanish and other works whose abstracts were written in English [12]. The analysed work selected information on the results of relapses and was grouped depending on the type of surgery, divided into randomised or non-randomised trials. The data obtained from the analysis of this extensive material showed that Bascom II surgery in randomised controlled trials was characterised by a 2.4% recurrence rate after 24-month follow-up and a 10.2% recurrence rate after 60 months. When analysing the results of both randomised and non-randomised trials, the results showed Bascom II was characterised by a 0.6% recurrence rate after 24-month follow-up and a 1.9% recurrence rate after 60 months. Taking into account the above data collected from the world literature, the results of treatment of pilonidal sinus using Bascom II procedure in the conducted clinical study are consistent with the results published by other authors and confirm the lowest rate of recurrence from all methods of operation of the pilonidal cyst. It should be noted that in the Bascom II study, patients were not selected for duration of disease, cyst size or associated diseases. The criterion for excluding patients from the study in the form of currently ongoing abscess in the cyst is recognised and commonly used criterion disqualifying from a planned operation. The study also included only adult patients. The criteria used in the study were consistent with those used by other authors [14, 15]. In order to more uniformly homogenise the study group, recurrent disease was excluded. The size of the skin incisions made was adjusted to the size of the sinus, but the surgical technique remained the same. It is noteworthy that all operations were performed by one operator in one surgical centre using the same protocol of perioperative care. The authors hope that the presentation of the above results and the assessment of the new operating method of Bascom II will be a practical indication for surgeons treating patients with pilonidal sinus.

CONCLUSIONS

1. Bascom II procedure is characterised by a low rate of relapse and short healing time of surgical wound. It is a safe, effective and fully accepted by patients method of treatment of pilonidal sinus;

2. Bascom II procedure significantly improves the patient's quality of life one year after surgery both in terms of physical and mental health assessment.

REFERENCES:

1. Mayo O.H.: Observations on injures and diseases of the rectum. Burgess and Hill, London 1833: 45–46.
2. Hull T.L., Wu J.: Pilonidal disease. Surg Clin North Am, 2002; 82(6): 1169–1185.
3. Hodges R.M.: Pilonidal sinus. Boston Med Surg J, 1880; 103: 485–486.
4. Schmidt J., Kużdżał J.: Podstawy chirurgii podręcznik dla lekarzy specjalizujących się w chirurgii ogólnej. Wyd. 2, MP Wydawnictwo, Kraków 2010: 852.
5. Shabbir J., Chaudhary B.N., Britton D.C.: Management of sacrococcygeal pilonidal sinus disease: a snapshot of current practice. Int J Colorectal Dis, 2011; 26: 1619–1620.
6. Wałęga P., Romaniszyn M.: Torbiel pilonidalna. Med Prakt Chir, 2013; 5: 57.
7. Petersen S.: [Pilonidal Sinus Disease; What is the Best Treatment Option?]. Zentralbl Chir., 2019 May 22. DOI: 10.1055/a-0901-7945.
8. Dessily M., Charara F., Ralea S., Allé J.L.: Pilonidal sinus destruction with a radial laser probe: technique and first Belgian experience. Acta Chir Belg, 2017; 117(3): 164–168.
9. Tien T., Athem R., Arulampalam T.: Outcomes of endoscopic pilonidal sinus treatment (EPSiT): a systematic review. Tech Coloproctol, 2018; 22(5): 325–331.
10. Alamdari D.H., Motie M.R., Kamalahmadi N., Aliakbarian M.: Autologous Platelet-Rich Plasma and Fibrin Glue Decrease Pain Following Excision and Primary Closure of Pilonidal Sinus. Adv Skin Wound Care., 2019; 32(5): 234–237.
11. Sood S.C., Green J.L., Parul R.: Results of various operations for sacrococcygeal pilonidal disease. Plast Reconstr Surg, 1975; 56(5): 559–566.
12. Stauffer V.K., Luedi M.M., Kauf P., Schmid M., Diekmann M. et al.: Common surgical procedures in pilonidal sinus disease: a meta-analysis, merged data analysis, and comprehensive study on recurrence. Sci Rep, 2018; 8(1): 3058.
13. Hryniewicz W., Kulig J., Ozorowski T., Kulig P., Wąchol D.: Stosowanie antybiotyków w profilaktyce okołooperacyjnej. Wyd. Narodowy Instytut Leków, Warszawa 2011: 5–10.
14. Guner A., Boz A., Ozkan O.F., Ileli O. et al.: Limberg flap versus Bascom cleft lift techniques for sacrococcygeal pilonidal sinus: prospective, randomized trial. World J Surg, 2013; 37(9): 2074–2080.
15. Sarhan A.E., Sherif T., Zakaria Y.: a prospective randomized trial comparing modified Limberg flap and cleft lift procedure in the treatment of uncomplicated sacrococcygeal pilonidal disease. Egypt J Surg, 2016; 35: 89–95.
16. Tezel E., Bostanci H., Anadol A.Z., Kurukahvecioglu O.: Cleft lift procedure for sacrococcygeal pilonidal disease. Dis Colon Rectum, 2009; 52(1): 135–139.
17. Kanlioz M., Ekici U.: Complications During the Recovery Period After Pilonidal Sinus Surgery. Cureus., 2019; 11(4): e4501.
18. Karydakis G.E.: Easy and successful treatment of pilonidal sinus disease after explanation of its causative process. Aust N z J Surg, 1992; 62: 385–389.
19. Søndenaa K., Andersen E., Nesvik I., Søreide J.A.: Patient characteristics and symptoms in chronic pilonidal sinus disease. Int J Colorectal Dis, 1995; 10(1): 39–42.
20. Mahdy T.: Surgical treatment of the pilonidal disease: primary closure or flap reconstruction after excision. Dis Colon Rectum, 2008; 51(12): 1816–1822.
21. Abdul-Ghani A.K., Abdul-Ghani A.N., Ingham Clark C.L.: Day-care surgery for pilonidal sinus. Ann R Coll Surg Engl, 2006; 88(7): 656–658.
22. Brown M., Crowe A., Cousins S.: Education patients and caregivers about pain management: What clinicians need to know. Moore R.J. (ed.). Handbook of pain and palliative care: biobehavioral approaches for the life course. Baltimor USA: Springer, 2012: 53–67.
23. Rich B.A., Dubois M.: Pain, Ethics, and Public Policy. Pain Med, 2011; 12(9): 1295–1296.
24. Reinke J.M., Sorg H.: Wound repair and regeneration. Eur Surg Res, 2012; 49(1): 35–43.
25. Townsend C.M. Jr, Beauchamp R.D., Evers B.M., Mattox K.L., Popiela T. (red. wyd. pol.): Chirurgia Sabistona, Elsevier Urban & Partner, wyd. I, tom 1., Wrocław 2010: 236.

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