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Retrospective Comparison of Postoperative Results in Whitehead's and Long's Surgery

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Abstract

Introduction: The aim of the thesis is a retrospective evaluation of the treatment effect in two groups of patients treated with Whitehead and Long procedure in the surgical department of our medical facility. ***Method:*** We evaluated a group of patients diagnosed with hemorrhoidal disease who underwent one of the above-mentioned surgical methods in 2017-2019. We focused on recording the age composition, gender, length of hospitalization and length of outpatient check-ups. ***Results:*** 80 patients were operated on in the given period. The average age was 54.2 years. The Whitehead's surgery was performed on 20 patients. Three patients of them were operated on for acute problems. The average length of hospitalization from the day after the surgery was 4.3 days. The time from the end of the check-ups to full recovery was 115.7 days. Long's surgery was performed on 60 patients. The average length of hospitalization was 2.6 days, the average duration of the examinations was 82.8 days. ***Conclusion:*** The Long's surgery appears to be equivalent in performance to the Whitehead's surgery, provided an appropriately chosen indication is performed by an experienced and educated surgeon.

Keywords: Whitehead's surgery, deformity, hemorrhoidal disease, Long's surgery

1. Introduction

Hemorrhoids are among the most well-known anal diseases. They were already described by Hippocrates (460-377 BC). The name comes from the Greek words (*haima*) "blood" and (*rhoos*) "current, flow". In its original physiological condition, it is a pillow-like filling of the anal canal, consisting of arteriovenous channels (hemorrhoidal plexus, corpus cavernosum recti) and fibrous tissue. Hemorrhoidal venous plexuses participate in defecation (function of the sphincter), sensing, or distinguishing the character of intestinal contents in the sense of gas, liquid and solid stool. Through these mechanisms, they also participate in the function (improvement) of continence (Arezzo A, Podzemny V, & Pescatori M., 2011; Khubchandani I, Paonessa N, & Azimuddin K., 2009). According to anatomical localization, we distinguish between 1) internal hemorrhoids (internal) – localized above the linea dentata (fibrovascular plexus located under the mucosa), 2) external hemorrhoids (external) – located below the linea dentata (fibrovascular plexus located subcutaneously in the area of the lower part of the anal canal). Some authors further distinguish between intermediate hemorrhoids located between the transition anocuta and linea dentata (Korbička J, Chalupník S, Cagaš J, et al., 2013).

With the degeneration of the connective collagen tissue, the hemorrhoidal nodes begin to prolapse. This pathogenesis is suggested by Thomson's study, which was confirmed by the conclusions of the works of Gass and Adams (Haas PA, Fox TAJ, & Haas GP, 1984; Thomson WH., 1975). Damage to the hemorrhoidal nodes thus causes various problems, often of a non-specific nature called "hemorrhoidal disease" (Longo A., 1998). The symptomatology of hemorrhoidal disease is different when external or internal hemorrhoids are affected.

General symptoms are most often itching, soreness, feeling of pressure of a foreign body in the anus and wetness of the anus. These symptoms are correlated with external factors of origin. First of all, these include constipation with a diet low in fiber (forced emptying dilates the venous sinuses, prolongs venous stasis and causes prolapse). In the second place, it is the already mentioned weakening of the collagen connective tissue (with age), subsequently bleeding occurs in the place of fragile tissue. Another factor may be the development of an anal infection in the area of irritated tissue. Last but not least, venous stasis contributes to the development of hemorrhoidal disease, which progresses during physical exertion, pregnancy, constipation and diarrhea (Abramowitz L, Weyandt GH, Havlickova, et al., 2010). A careful anamnesis, clinical examination and anoscopy according to the practice of the workplace in the examination position on the left side (Sims position), position on all four limbs (genocubital position) or in the gynecological (lithotomy) position leads to the establishment of the correct diagnosis. Colonoscopy (especially if there is a positive family history) or at least sigmoidoscopy seems appropriate to rule out other pathology on the rectum and colon. If the patient refuses, it is worth considering at least a stool test for occult bleeding. However, these examinations cannot replace the desired anoscopy. In case of diagnostic embarrassment due to poor accessibility in immobile patients, we preferably use videorectoscopy.

There are several types of classifications to assess the progress of hemorrhoidal disease. Internal hemorrhoidal disease is usually classified according to Banov – Goligher (stages I, II, III, IVa, IVb). Another classification, according to Lunnisse and Morgado, combines anatomical classification with symptomatology. The PATE 2006 classification or Gerjiy's classification is more accurate, which also takes into account external hemorrhoids (Korbička J, Chalupník S, Cagaš J, et al., 2013).

Conservative therapy is indicated for all stages of the disease. These include adjusting your diet, maintaining regular soft stools, and increasing anal hygiene. Medicinal treatment options include venotonics, vasoconstrictors, astringents, protectants, laxatives and possibly even local anesthetics (Korbička J, Chalupník S, Cagaš J, et al., 2013; Örhalmi J, Klos K, Jackanin S, et al., 2011). Depending on the extent of the disease, we perform surgical therapy on an outpatient basis or during hospitalization. The most widespread outpatient methods are sclerotization (more recently with 3% polidocanol foam), cryotherapy (cryodestruction), infrared photocoagulation, monopolar thermocoagulation (Hemoron, Ultroid), bipolar thermocoagulation (BICAP-bipolar circumactive probes), bipolar radiofrequency induced thermotherapy (RFITT). DG-HALL (Doppler-guided Haemorrhoidal Artery Ligature) and THD (transanal haemorrhoidal dearterialization) are often referred to as mini-invasive procedures (Arezzo A, Podzemny V, & Pescatori M., 2011). Emborrhoid stands on the edge. It is a radiological intervention technique based on selective embolization of the terminal branches of the superior rectal artery. Open excision of nodes (Langenbeck and Milles in 1919) was gradually modified to open hemorrhoidectomy (Milligan-Morgan in 1937) and submucosal hemorrhoidectomy according to Parks (Parks in 1956) (Klobušický P, Ježek J, Malý P, et al., 2007). Ferguson (1959) described a segmental hemorrhoidectomy with complete closure of the defects. From our own experience, we add that a compromise is often chosen in the form of incomplete defect closure. The addition of transligation of internal hemorrhoids is no exception. There is not much convincing evidence in the literature conclusively favoring one surgical technique over others (Arezzo A, Podzemny V, & Pescatori M., 2011). Classical surgical procedures can be performed with a Yag laser, CO2 laser, harmonic knife, LigaSure (Šimša J, Bulíček K, Poch T, et al., 2008), monopolar electrocoagulation, or conventional surgical instruments (Korbička J, Chalupník S, Cagaš J, et al., 2013). Local, induction, or general anesthesia is chosen according to the practice of the workplace and the possibilities of the patient. The question remains the use of antibiotics, or effect of postoperative metronidazole (Cheetham MJ, Phillips RKS., 2001).

1.1 Whitehead's Procedure

Whitehead's surgery has been known since 1882 (Whitehead W., 1882). During the last quarter of the 20th century, various variations of the operative technique were described (White, Barrios, Sagar and Wolff, Burchell, Bonello) (Bonello JC., 1988; Burchell MC, Thow GB, Manson RR., 1976; Erzurumlu K, Karabulut K, Özbalcı GS, et al., 2017; White JE, Syphax B, Funderburk WW., 1972). It is considered by many authors to be obsolete and even controversial (Korbička J, Chalupník S, Cagaš J, et al., 2013). Other authors consider this method to be equivalent without statistically significant postoperative complications. However, it depends on the experience of the operator and the appropriate indication (Bonello JC., 1988; Erzurumlu K, Karabulut K, Özbalcı GS, et al., 2017; Maria G, Alfonsi G, Nigro C, & Brisinda G., 2001)

This method of treatment is practically used for fourth-degree hemorrhoid only (Kraemer M & Seow-Choen F., 2000; Pata F, Gallo G, Pellino G, et al., 2021) and/or thrombosed hemorrhoids (Bonello JC., 1988; Burchell MC, Thow GB, & Manson RR., 1976; Erzurumlu K, Karabulut K, Özbalcı GS, et al., 2017; Maria G, Alfonsi G, Nigro C, & Brisinda G., 2001). It consists of complete circular resection of the corpus cavernosum (mucous membrane with nodes), i.e., internal hemorrhoids, with subsequent suturing of the anoderm to the proximal mucous membrane (proximal mucosa) (Figure 1-3).

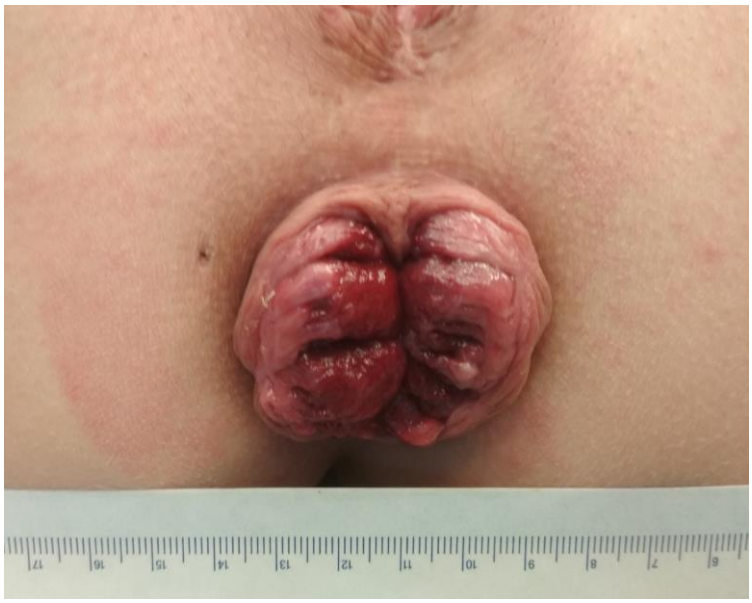

Figure 1. Preoperative condition — circular prolapse

Figure 2. Result of operative performance according to WH

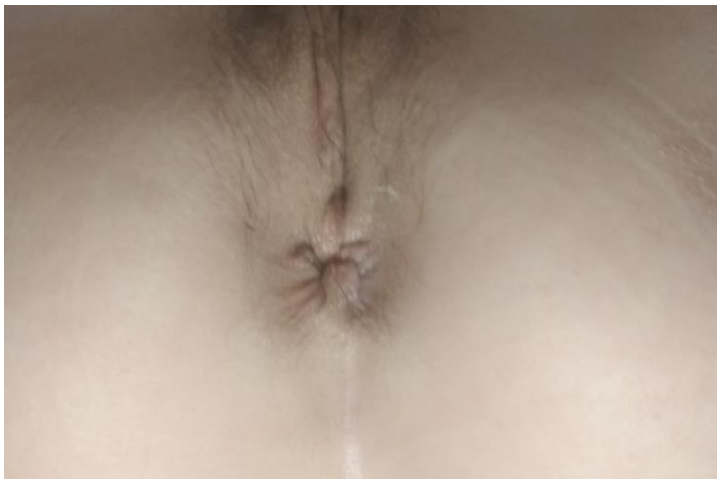

Figure 3. Checkup after 1 year from the surgery (WH)

Several studies have pointed to the fact that poor surgical outcomes are often the result of incorrect technique (such as skin excision) and incorrect anatomical concepts (misunderstanding of anatomy) (Bonello JC., 1988; Maria G, Alfonsi G, Nigro C, & Brisinda G., 2001; Kraemer M, Seow-Choen F., 2000).

Some surgical texts between the middle of the 19th century and the first half of the 20th century mistakenly equated the linea dentata with the linea alba (Hilton). However, it is located 1.3 cm more distally on average (Pata F, Gallo G, Pellino G, et al., 2021; DeCourcy JL., 1945). "Mistaking the linea alba (Hilton) for a mucocutaneous junction would mean the difference between good results and mucosal ectropion or stricture" (Bonello JC., 1988). Thus, the linea alba is the border of the so-called surgical anal canal, while the linea dentata is the border of the anatomical canal (Figure 4). The linea dentata can also be confused with the linea anorectalis. The appearance is often bland or only slightly different in color.

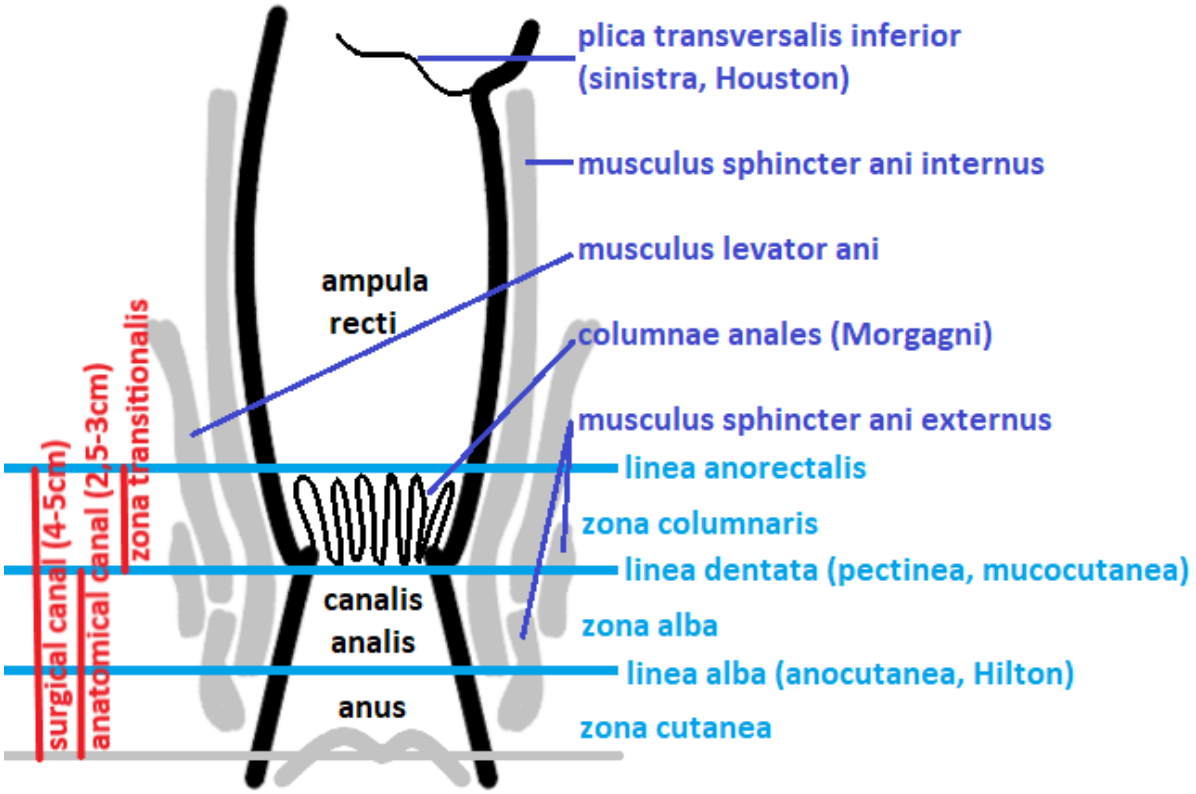

Figure 4. Anatomical structure of the anal canal

Complications include stenosis, pain, anal incontinence, fecal impaction, urinary retention, Whitehead deformity, perioperative or postoperative blood loss, and fistula/abscess formation. Anal incontinence is caused by a decrease or loss of pressure in the anal sphincter. Fecal impaction can occur in an inadequately prepared patient. The same goes for avoiding defecation for fear of pain. The solution is the administration of laxatives. A cut in the region of the anoderm of the sphincter causes the most pain. Soreness (mainly ineffectively dampened postoperatively) contributes to the weakness of the bladder during contraction during emptying and is thus closely related to the occurrence of urinary retention (Erzurumlu K, Karabulut K, Özbalcı GS, et al., 2017). Whitehead's deformity occurs as a result of suture dehiscence or a technical error in the surgery. It is conditioned by the rotation of the outer skin or mucous membrane into the anal canal.

According to the study by Kraemer et al. (2000) the Whitehead surgery has even fewer complications in older patients compared to younger patients. However, elderly patients are statistically more susceptible to sphincter spasm and stenosis (Erzurumlu K, Karabulut K, Özbalcı GS, et al., 2017; Kraemer M & Seow-Choen F., 2000). As part of prevention, some authors leave it in the anal canal rectal tube for up to three days (Erzurumlu K, Karabulut K, Özbalcı GS, et al., 2017).

1.2 Long's Procedure

Stapler hemorrhoidopexy was put into practice in 1998 by the Italian surgeon Antonio Longo. He performed this

revolutionary method of treating hemorrhoids with a special circular stapler without direct intervention in the anal canal (Longo A., 1998). It is indicated for hemorrhoids III. - IV. degrees, especially with prolapse of the anal mucosa (Král J., 2007). The principle of the method consists of the resection of an approximately two-centimeter cylinder of mucosa and submucosa with vessels leading to hemorrhoidal nodes approximately 3-4 cm above the linea dentata while simultaneously suturing the defect. Lifting the nodes to the original anatomical position solves anal prolapse, reduces congestion of internal nodes. They subsequently atrophy, but persist (Korbička J, Chalupník S, Cagaš J, et al., 2013; Nahas SC, Borba MR, Brochado MCT, et al., 2003).

Therefore, Long's surgery (mucosectomy) cannot be used for the treatment of external hemorrhoids, its use for external-internal nodes is debatable. The main disadvantage is the purchase price of the stapler. Complications include postoperative bleeding (Král J., 2007), anal fissure, rectal stenosis, recurrence of prolapse and persistent pain. Rectovaginal fistula, rectal perforation, pelvic sepsis, intramural rectal abscess and anal incontinence are also described in the literature (Klobušický P, Ježek J, Malý P, et al., 2007).

2. Method

We evaluated a set of patients whose hemorrhoidal disease was treated by one of the two methods listed below (Table 1). Data on these patients were retrospectively evaluated with regard to age, gender and postoperative complications. Follow-up of patients (i.e., monitoring even after healing) was one year.

Table 1. Spectrum of the patient population

	Long	Whitehead
Total number of patients	60	20
Women	28	5
Men	32	15
Average age (median) [years]	54.8 (52.8)	53.6 (50.6)
Youngest patient [years]	26.3	39.8
Oldest patient [years]	88.1	74.3
Average days of hospitalization after surgery	2.6	4.3
Average days to full recovery	82.8	115.7
Number of acute surgeries	0	3

3. The Results

In the given period of 3 years, we operated on a total of 319 patients with hemorrhoidal disease at our workplace. From this set, we present the system in 80 patients with advanced findings. Whitehead surgery was performed on 20 patients (5 women, 15 men), of which 3 patients were operated on for an acute indication. These were acute node herniation, circular thrombosis and irreparable inflamed hemorrhoidal node. Long's surgery was performed in 60 patients (28 women, 32 men). The average length of hospitalization from the day following surgery was 4.3 days for the Whitehead method, 2.6 days for the Long method.

The time until the end of check-ups for patients treated according to Whitehead, i.e., until full healing, was 115.7 days, and 82.8 days for Long's method. This time also includes the length of time until postoperative complications heal. The average age of the first group (Whitehead) was 53.6 years (median 50.6) on the day of the surgery. The youngest patient was 39.8 years old, the oldest patient was 74.3 years old. In the second group, i.e., surgery according to Long, the average age was 54.8 years (median 52.8). The youngest patient was 26.3 years old and the oldest patient was 88.1 years old. In the overview table (Table 2), we present the event. postoperative complications and degree of postoperative stool incontinence (Table 3).

Table 2. Postoperative complications

	LG - early	LG - late	WH - early	WH - late
Bleeding with revision	1	-	1	-
Thrombosis with revision	1	2	-	1
Stenosis with necessary MDA	-	1	1	1*

Prolapse, excision of the marcus	-	2	-	1*
Transient stenosis treated conservatively	1	2	-	2

Note: * = Condition after an acutely performed surgery.

Table 3. Postoperative incontinence according to CCFIS

	Long	Whitehead
Transient	5b	7b*
Permanent	3b, 10b, 7b	-

Note: * = Condition after an acutely performed surgery

In the group of patients operated according to WH, surgery revision was necessary in one case for bleeding. There was one revision for thrombosis. In one case, excision for a nuisance mariscus was added. In two cases, MDA for stenosis was performed under general anesthesia. In two cases, the stenosis was treated with good effect on an outpatient basis with dilators.

4. Discussion

In the professional literature, we encounter diametrically different opinions on the meaning of Whitehead's method (Korbička J, Chalupník S, Cagaš J, et al., 2013; Whitehead W., 1882; Bonello JC., 1988). Badly indicated procedures performed with insufficient routine, inexperience of the operator and misunderstanding of the anatomy of the linea dentata have a negative effect on the outcome of the surgery. On the contrary, if these basic conditions are observed, many authors report favorable results. Wolff (1988) in a study of 440 patients (with a follow-up of 3 years) demonstrates a 6.9% incidence of flap disintegration, a non-healing wound in 1 patient, a fistula or abscess in 1.1%, no recurrence or occurrence of ectropion or strictures. Total Morbidity 12.2%. Bonello (1988) describes a study of 356 patients (or 295 were analyzed), where only 5 patients had symptomatic contracture. Three patients required reoperation and one a second reoperation. Maria et al. (2001) describe in a study of 26 patients (with a follow-up of 3 years) only 1 case of stenosis treated conservatively on an outpatient basis. Khubchandani (1984) observed 6 cases of early postoperative complications in a group of 84 patients. Hodedadi (1979) observes symptom-free follow-up for 1 year in 13 patients. However, in 41 patients operated on for acute etiology, Barrios (1979) reports 31.7% of urinary complications requiring catheterization.

The most detailed analysis of the frequency of postoperative complications is provided by Erzurumlu (2017) in a group of 49 patients. Postoperative complications include bleeding (6.12%, three cases), stricture (2.04%, one case), urinary retention (16.33%, eight cases) and temporary anal incontinence (2.04%, one case). No patient developed Whitehead deformity, ectropion, or infectious complications. Overall morbidity was 26.53%. It should be mentioned that 23 patients (46.94%) had extensive acute thrombosis and inflammation.

Mukhashavria (2011) in a study of 294 patients with acute circumferential excision reports urinary retention in 39 cases (13.2%), 1 case (0.3%) of fecal impaction, 3 cases (1%) of delayed complete epithelialization of the wound and easily digitally dilatable stricture in 26 patients (8.8%). There were 271 (92.2%) truly asymptomatic patients.

The length of hospitalization after WH surgery varies according to different authors. Kraemer (2000) gives 3 days, Mukhashavria (2011) 3.1 days, Maria (2001) until the 5th postoperative day and Erzurumlu (2017) even 6.45 days. In our case, it was 4.3 postoperative days.

In our study, we retrospectively evaluated the postoperative results of the Long and Whitehead method. At our workplace, we perform both types of these services as standard. They are performed by a trained and stable team with many years of experience in proctology. Individual types of procedures were chosen depending on the clinical findings and the experience of the operator. All patients received mechanical bowel preparation. After the surgery, a "chimney" made of spongostan was applied for 1 day. On the first postoperative day, only liquid food and a laxative were given. An antiseptic bath (pale pink hypermanganese solution) was applied in the postoperative period to patients with the Whitehead operation. In case of urinary retention, PMK was temporarily introduced.

We distinguish between early (appeared during hospitalization) possible postoperative complications and late (appeared after discharge to home care). Depending on their nature, they were treated on an outpatient basis or in the operating room. The frequency of complications (Table 2) with Long's method was similar to that in other medical facilities. Whitehead's method was used in all acute patients, which undoubtedly had an effect on postoperative complications and prolongation of hospitalization.

The age composition of both groups of patients was comparable. All resections were histologically examined. No malignancy was found in any specimen. Staplers (all 34 mm) from several manufacturers were used for surgical procedures (LG). Analgesia was performed with a combination of paracetamol/tramadol or paracetamol/metamizole. Postoperative controls included anoscopy.

The number of operators (Kraemer M & Seow-Choen F., 2000; Wolff BG., 1988) also influences the evaluation of the results of surgical procedures. In our study, a set of patients with Long's method was operated by one operator. For the set with the method according to Whitehead, there are three surgeons.

5. Conclusion

There is little evidence to support the use of one surgical technique over another. Our retrospective analysis evaluated the results of both groups of patients. Although this is a small set of patients, the results obtained show that both of these surgical procedures appear to be effective in dealing with advanced hemorrhoidal nodules. The advantage of Long's method is a minimally invasive procedure, during which the original position of the hemorrhoidal plexuses is restored.

However, for extensive fibrotic hemorrhoids that cannot be repaired, the classic method is often more suitable, according to Whitehead. Lower costs for its implementation are still a significant reason for some workplaces.

The aim of this article is to provoke a constructive discussion with the aim of re-evaluating age-old procedures. Some may be based on inappropriately objectified data. We believe that the Whitehead surgery is an equivalent performance to the other methods, provided that the indication is appropriately chosen when the surgery is performed by an experienced and educated operator when the morbidity rate is similar to that of the other methods. For an inexperienced operator, performance according to Milligan-Morgan in two periods seems to be an interesting alternative to Whitehead's method. The use of classic hemorrhoidectomy has its justification even today.

The results confirm that a number of objections against surgery according to Whitehead are unfounded. In addition, the result cannot be compared with the result of a simple hemorrhoidectomy used for the initial stages of hemorrhoidal disease. Simple hemorrhoidectomy is insufficient in the treatment of circular hemorrhoidal prolapse. It can only be solved effectively by the more technically demanding Whitehead performance. It thus provides successful results in patients with predominant peripheral prolapse and/or thrombosis. To illustrate the effective solution of circular prolapse, we present in the appendix a picture of the patient's preoperative condition (Figure 1), as a result of the surgical procedure solved according to Whitehead (Figure 3) and the findings during an outpatient check-up 1 year after the surgery (Figure 3).

List of Abbreviations

LG — Long's surgery

WH — Whitehead's surgery

MDA — manual dilatation of the anus

CCFIS — Cleveland Clinic faecal incontinence (Wexner) score

Compliance with Ethical Standards

Conflict of Interest

The authors of the thesis declares that they have no conflict of interests related to the topic, creation and publication of this article, and that neither the creation nor the publication of the article was supported by any pharmaceutical company.

Ethics Committee Approval

The authors declare that the research was conducted in accordance with the principles of the Declaration of Helsinki of the World Medical Association.

Informed Consent

Informed consent was obtained from the patient for publication of this case report and any accompanying images.

Image Documentation Authorship

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