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ORIGINAL ARTICLE

Stapled hemorrhoidopexy: functional results, recurrence rate, and prognostic factors in a single center analysis

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Abstract
Purpose Since its introduction, stapled hemorrhoidopexy (SHP), the so-called Longo procedure, became a widely accepted treatment option for prolapsing hemorrhoids. Nevertheless, from the early years, concerns grew about the early functional results and potential recurrences. In order to evaluate of SHP with special respect to early defecation disorders und recurrences, our single institute high-volume results were evaluated.
Method One thousand one hundred forty-four consecutive patients with SHP for prolapsing hemorrhoids were evaluated in a period from January 2007 to December 2013. In a prospective analysis, patients were followed with special respect to postoperative complications, functional disorders, mainly perianal irritation, stenosis, and recurrence.
Results During the timeframe, a total of 663 men and 481 women were treated for prolapsing hemorrhoids. The mean age was 52.6 years (±14.4 years). Indication for surgery was prolapsing hemorrhoids in all cases. In addition to prolapse, 90 patients (7.9 %) suffered from bleeding, 96 patients (8.4 %) had itching, and 95 (8.3 %) had anal wetness; the mean operative time was 11 min (±4 min). Patients were treated as inpatients; the mean hospital stay was 3 days (±1 day). Early complications were observed in 14 patients (1.2 %). The follow-up revealed inflammatory reaction at the stapleline in 8 patients (0.7 %) and rectal stenosis in 22 cases (1.9 %), and recurrence was observed in 46 cases (4.0 %).
Conclusion The data presented here provide evidence that SHP is a save procedure with a very low rate for functional disorders and low recurrence rate. Therefore, in our hands, SHP remains standard for prolapsing hemorrhoids.

Keywords Hemorrhoid · Prolapse · Surgery · Complication · Recurrence

Introduction

Since its introduction in 1997, stapled hemorrhoidopexy (SHP), so-called Longo procedure, has become a widely accepted and recommended procedure for third degree hemorrhoids and some surgeons might also perform SHP for second-degree prolapses [1, 2]. In comparison to conventional hemorrhoidectomy, the reduction of postoperative pain and the shorter hospital stay made SHP a recommended surgical procedure. Recently published reviews showed data that there is no conclusive evidence for the long-term benefit of stapled procedure, but patient's acceptance is high [3, 4]. Stapled hemorrhoidectomy can be regarded as a well-established procedure with relatively low complication rates. If feasible, it is recommended as the first-choice procedure when postoperative pain is considered [5]. However, since its introduction, concerns about functional results and the recurrence rate are in debate [6]. Already in the early phase, Cheetham found high rate of urgency [7]. This publication caused a very unenthusiastic introduction of Longo's procedure in the UK. Concerns about the functional results remained over the last one and a half decades.

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Recently, newer surgical techniques such as the Doppler-guided hemorrhoidal arterial ligation, so-called HAL-RAR procedure were introduced and gave a new impact on the discussion about best treatment for prolapsing hemorrhoids with special respect on postoperative discomfort [8, 9]. Therefore, our intention was to evaluate the Sondershausen Hospital results, as a resembling example for a single-center high volume unit in a third-degree district hospital.

Method

One thousand one hundred forty-four consecutive patients with third-degree prolapsing hemorrhoids, who underwent stapled hemorrhoidopexy, were evaluated in a period from January 2007 to December 2013. Follow-up was organized by the outpatient clinics. Patients were asked for reevaluation 3 months and 1, 3, and 5 years after surgery.

Technique

SHP was regularly performed under general anesthesia: patients were placed in lithotomy position. Single-shot antibiosis was not given routinely. According to the surgeons, assessment one pursestring sutures were carried out. The surgical device was either a PPH03, 33-mm diameter stapler device by Ethicon Endosurgery® or an EEA stapler provided by Autosuture Covidien®. Additional stitches for hemostasis were performed regularly at the stapled ring using monofilament resorbable sutures. Patients left the hospital as soon as they felt comfortable: No day-surgery was performed.

Patients were invited for follow-up checks after a 3-month, a 1-year interval, and 3 years as well as 5 years after surgery.

Irritation was defined as a complex of symptoms associated with perianal discomfort and itching, without significant evidence of recurrent prolapse. Stenosis was defined as stricture of the lower rectum that cannot be passed by the finger. Any evidence of prolapsing hemorrhoidal mass was recorded as recurrence of hemorrhoidal prolapse.

Patients were screened for incontinence episodes prior to surgery. Only in cases with any evidence for fecal incontinence, the Cleveland Clinic Incontinence Score was used for classification [10].

Data management and statistical analysis

Statistical analysis was performed using the SPSS 18.0 software package (SPSS Inc., USA). Pearson chi-squared test compared the incidence of variables and *t* test for comparison of the means for the groups with or without additional anastomotic stapling. Correlation between variables was performed using two-tailed Pearson correlation test. For multivariate analysis, the Cox regression calculation in stepwise forward technique was used. Variables with p value less than 0.05 were considered to be significant.

Results

During the study period, a total of 663 men and 481 women were treated for prolapsing hemorrhoids. The mean age was 52.6 years (±14.4 years). Indication for surgery was prolapsing hemorrhoids in all cases. In addition to prolapse, 90 patients (7.9 %) suffered from bleeding, 96 patients (8.4 %) had itching, and 95 (8.3 %) had anal wetness; the mean operative time was 11 min (±4 min). Patients were treated as inpatients; the mean hospital stay was 3 days (±1 day).

From 2007 to 2013, a minimum of 68 patients and a maximum of 218 patients were treated each year.

Early postoperative complications were observed in 14 patients (1.2 %) including four patients with bleeding, which required examination under anesthesia und suturing of bleeding mucosa. Additional ten patients had endoscopy for complains after surgery, without any significant findings.

The mean follow-up was 14.1 months. The follow-up revealed inflammatory reaction at the stapled line in 8 patients (0.7 %) and rectal stenosis in 22 cases (1.9 %), and recurrence was observed in 46 cases (4.0 %).

Anal irritation was observed in the early phase after surgery only: In six cases, irritation occurred after 3 months, in two additional cases after 1 year. No events of perianal irritation were seen after 1 year. There were no patients complaining about symptoms of fecal urgency at 3-month follow-up or later.

Incontinence of different degrees was observed in 32 patients prior to surgery. The preoperative CCIS ranged from 9 to 16 and the mean CCIS was 11.3. The range postoperatively was 6 to 16, and the mean incontinence score was 11.1 points, which was an insignificant difference. Overall, incontinence improved in 13 patients; in five patients, the CCIS remained the same and the CCIS decreased in 14 patients.

Stenosis also occurred mainly early after SHP. After 3 months of follow-up, 19 patients revealed low rectal stenosis with the necessity of digital dilatation. In the 1-year follow-up, one patient showed up with stenosis, as well as in the 3- and 5-year follow-up.

Recurrence was observed in two patients after 3 months. The majority of recurrences were observed at 1-year follow (n=18) and at 3-year follow-up (n=20). Only seven patients developed recurrent prolapse after 5 years.

The potential prognostic factors for the recurrence were evaluated in univariate analysis, using chi-squared test and *t* test. The results are shown in Table 1. Duration of the surgical procedure as well as the length of hospital stay were longer in patients with recurrences. During the follow-up period, the number of recurrences

Table 1 The potential prognostic factors for the recurrence evaluated in univariate analysis

Variable		No recurrence (n=1098)	Recurrence (n=46)	p Value
Age (years)		52.3 (14.4)	51.8 (14.3)	0.96
Gender	Female	464	17	0.51
	Male	634	29	
Operative time (min)		11 (4)	13 (6)	<0.01
Hospital stay (days)		3.2 (0.7)	3.5 (0.6)	0.03
Year	2007	68	11	<0.01
	2008	119	10	
	2009	172	8	
	2010	162	7	
	2011	169	5	
	2012	218	2	
	2013	190	3	
Preoperative bleeding	Yes	1012	42	0.83
	No	86	4	
Preoperative itching	Yes	39	7	0.08
	No	1010	39	

decreased from 2007 to 2013 significantly (p<0.01) (Fig. 1).

Discussion

SHP is a widely accepted procedure for prolapsing hemorrhoids. Nevertheless, the functional outcome is in debate since its introduction nearly 20 years ago [7, 11]. The objective of the presented analysis was to assess the functional results in a single center setting with special respect to functional outcome.

The data offers substantial evidence that Longo's procedure is safe with a low complication rate and minor functional complication.

The hospital stay and early complication rate is comparable to other reports [12]. However, it is obvious that hospital stay mainly related to the health care system. In this respect, it needs to mention that Longo's procedure is also possible on a day case basis [13–15].

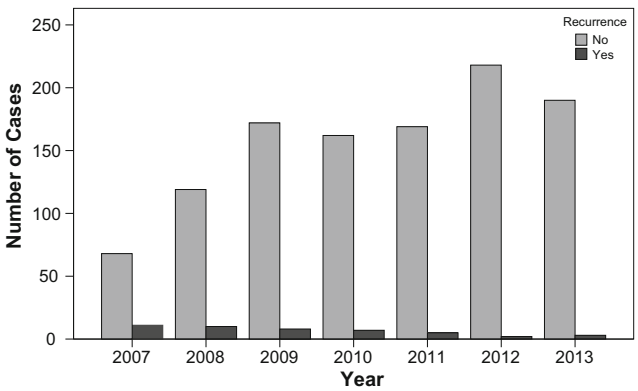

Fig. 1 Number of recurrence during the follow-up period

Functional

The rate of perianal discomfort was less than 1 % in this study. Symptoms of irritation were mainly observed in the early postoperative phase within 1 year after surgery [16]. Symptoms like that were not observed later than 1 year. This is in correspondence to other publications. For example, Mlakar et al. recently published data that irritation is only seen early postoperative [17]. The often mentioned fecal urgency was not observed in this study. This is probably caused by the fact that urgency is a typical finding of the very first postoperative time. Usually urgency disappears within the first 6 weeks after SHP [6].

Stenosis

The observed incidence of stenosis following SHP is 1.9 % in the presented study, which is comparable to the stenosis rate published by other authors. A few studies reported no stenotic events after SHP; however, the stenosis rate following stapled mucosectomy generally ranges from 0.8 to 5.0 % [4]. Stenotic events after SHP are mostly without any symptoms. In addition, the treatment is usually digital dilatation of the stenosis, like it was the case in this series. Rarely, it might be necessary to cut a scaring ring in additional surgery [18].

Recurrence

In this observation study, the recurrence rate was 4.0 %. This recurrence rate is comparable to other publications about

Longo's SHP procedure [19]. Only a minority of publications showed higher recurrence rates [20]. In contrast, many studies provided evidence that a recurrence rate up to 5–8 % might be expected [21]. Predictive factors for recurrence were early years after introduction of the method and longer duration of operation and longer hospital stay. These facts provide evidence that there is a learning curve for Longo's technique [22]. In addition, more complicated cases need longer operative time and might stay longer in hospital. It was not possible to provide detailed evidence, what might cause longer operative time, e.g., the size of the specimen did not show any conclusive evidence. One might suggest that patients in the early years show higher recurrence rate because the follow-up is longer. However, nearly 50 % of recurrences were observed within the first year of follow-up. Therefore, this argument is missing support.

Comparing the data of this analysis to the results, published in large systemic reviews or the Cochrane analysis, it needs to state that theses analysis show substantial problems in choice of publications and statistical evaluation, which was mentioned earlier [3, 4, 23–25]. However, the major conclusion of these systemic reviews is that SHP is associated with a higher long-term risk of hemorrhoid recurrence and the symptom of prolapse [23]. The review of Tjandra et al. found a recurrence rate 12 months after SHP of 5.7 % compared to 1 % after conventional hemorrhoidectomy. On the other hand, the 12-month recurrence rate in this study was 1.8 %, which is close to the results for conventional surgery [4].

Conclusion

The data presented here provide evidence that SHP is a save procedure with a very low rate of functional disorders and low recurrence rate. Therefore, in our hands, SHP remains standard procedure for prolapsing hemorrhoids.

Authors' contribution Arndt Voigtsberger: substantial contributions to conception and design; Lucia Popovicova acquisition of data; Gunter Bauer acquisition of data; Knut Werner acquisition of data; Tina Weitschat-Benser acquisition of data; Sven Petersen: data analysis, manuscript with critical revising of the text for important intellectual content.

References

1. Pescatori M, Favetta U, Dedola S, Orsini S (1997) Transanal stapled excision of rectal mucosal prolapsed. Tech Coloproctol 1:96–98
2. Altomare DF, Roveran A, Pecorella G, Gaj F, Stortini E (2006) The treatment of hemorrhoids: guidelines of the Italian Society of Colorectal Surgery. Tech Coloproctol 10:181–186
3. Jayaraman S, Colquhoun PH, Malthaner RA (2007) Stapled hemorrhoidopexy is associated with a higher long-term recurrence rate of internal hemorrhoids compared with conventional excisional hemorrhoid surgery. Dis Colon Rectum 51:1297–1305
4. Tjandra JJ, Chan MK (2007) Systematic review on the procedure for prolapse and hemorrhoids (stapled hemorrhoidopexy). Dis Colon Rectum 50:878–892
5. Joshi GP, Neugebauer EA, Collaboration P (2010) Evidence-based management of pain after haemorrhoidectomy surgery. Br J Surg 97:1155–1168
6. Cosenza UM, Conte S, Mari FS, Nigri G, Milillo A, Gasparrini M, Pancaldi A, Brescia A (2013) Stapled anopexy as a day surgery procedure: our experience over 400 cases. The surgeon : journal of the Royal Colleges of Surgeons of Edinburgh and Ireland 11(Suppl 1):S10–13
7. Cheetham MJ, Mortensen NJ, Nystrom PO, Kamm MA, Phillips RK (2000) Persistent pain and faecal urgency after stapled haemorrhoidectomy. Lancet 356:730–733
8. Faucheron JL, Poncet G, Voirin D, Badic B, Gangner Y (2011) Doppler-guided hemorrhoidal artery ligation and rectoanal repair (HAL-RAR) for the treatment of grade IV hemorrhoids: long-term results in 100 consecutive patients. Dis Colon Rectum 54:226–231
9. Scheyer M, Antonietti E, Rollinger G, Lancee S, Pokorny H (2015) Hemorrhoidal artery ligation (HAL) and rectoanal repair (RAR): retrospective analysis of 408 patients in a single center. Tech Coloproctol 19:5–9
10. Jorge JM, Wexner SD (1993) Etiology and management of fecal incontinence. Dis Colon Rectum 36:77–97
11. Fueglistaler P, Guenin MO, Montali I, Kern B, Peterli R, von Flue M, Ackermann C (2007) Long-term results after stapled hemorrhoidopexy: high patient satisfaction despite frequent postoperative symptoms. Dis Colon Rectum 50:204–212
12. Jongen J, Bock JU, Peleikis HG, Eberstein A, Pfister K (2006) Complications and reoperations in stapled anopexy: learning by doing. Int J Colorectal Dis 21:166–171
13. Hidalgo Grau LA, Heredia Budo A, Llorca Cardenosa S, Carbonell Roure J, Estrada Ferrer O, Garcia Torralbo E, Sunol Sala X (2012) Day case stapled anopexy for the treatment of haemorrhoids and rectal mucosal prolapse. Colorectal Dis 14:765–768
14. Slawik S, Kenefick N, Greenslade GL, Dixon AR (2007) A prospective evaluation of stapled haemorrhoidopexy/rectal mucosectomy in the management of 3rd and 4th degree haemorrhoids. Colorectal Dis 9:352–356
15. Vinson-Bonnet B, Higuero T, Faucheron JL, Senejoux A, Pigot F, Siproudhis L (2015) Ambulatory haemorrhoidal surgery: systematic literature review and qualitative analysis. Int J Colorectal Dis 30:437–445
16. Ommer A, Wenger FA, Rolfs T, Walz MK (2008) Continence disorders after anal surgery—a relevant problem? Int J Colorectal Dis 23:1023–1031
17. Mlakar B, Kosorok P (2003) Complications and results after stapled haemorrhoidopexy as a day surgical procedure. Tech Coloproctol 7:164–167, **discussion 167–168**
18. Petersen S, Hellmich G, Schumann D, Schuster A, Ludwig K (2004) Early rectal stenosis following stapled rectal mucosectomy for hemorrhoids. BMC Surg 4:6
19. Ommer A, Hinrichs J, Mollenberg H, Marla B, Walz MK (2011) Long-term results after stapled hemorrhoidopexy: a prospective study with a 6-year follow-up. Dis Colon Rectum 54:601–608
20. Longo A (2002) Stapled anopexy and stapled hemorrhoidectomy: two opposite concepts and procedures. Dis Colon Rectum 45:571–572, **discussion 572**
21. Boccasanta P, Capretti PG, Venturi M, Cioffi U, De Simone M, Salamina G, Contessini-Avesani E, Peracchia A (2001) Randomised controlled trial between stapled circumferential mucosectomy and conventional circular hemorrhoidectomy in

advanced hemorrhoids with external mucosal prolapse. Am J Surg 182:64–68
22. Jongen J, Eberstein A, Bock JU, Peleikis HG, Kahlke V (2010) Complications, recurrences, early and late reoperations after stapled haemorrhoidopexy: lessons learned from 1,233 cases. Langenbecks Arch Surg 395:1049–1054
23. Jayaraman S, Colquhoun PH, Malthaner RA (2006) Stapled versus conventional surgery for hemorrhoids. The Cochrane database of systematic reviews CD005393
24. Petersen S, Jongen J (2008) Meta-analysis results need to be evaluated with caution. Dis Colon Rectum 51:1853–1854, **author reply 1355–1856**
25. Jongen J, Petersen S (2009) Letter to the editor: reviewing reviewers and reanalysing meta-analyses of stapled haemorrhoidopexy? Int J Colorectal Dis 24:989