Original Article

Short Term Result with High Satisfaction of Stapled Hemorrhoidopexy for Grade III and IV Hemorrhoids: A Five Year Single-center Experience from 501 Cases

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Purpose. Hemorrhoids are typical cushion structure in anal canal. Conservative treatments are reserved for first- and second-degree hemorrhoids and operative hemorrhoidectomies are performed on patients with symptomatic third- and fourth-degree hemorrhoids. Stapled hemorrhoidopexy (SH) has been widely accepted; however, data describing long-term complications after SH is limited. Our study aimed to expand the understanding of clinical outcomes and share our experiences to solve post-operative stenosis.
Methods. We performed a retrospective cohort analysis using prospectively collected data, including patients who underwent SH at Songshan Branch, Tri-Service General Hospital, National Defense Medical Center between January 1, 2012, and December 31, 2016. Patients undergoing this procedure for grade III or IV mucosal-hemorrhoidal prolapse were included. Patient characteristics were analyzed.
Results. We conducted 501 cases in our study. SH was more common among women (318 cases; 63.4%) than men (183 cases; 36.6%) and grade IV (329 cases; 65.6%) than grade III (172 cases; 34.4%). The overall incidence of surgical complications was 19% (95 cases): post-operative bleeding (10 cases; 2%); urinary retention (41 cases; 8.2%); post-operative fever (7 cases; 1.4%); anal thrombosis (7 cases; 1.4%); anal stenosis (23 cases; 4.6%); fecal urgency/tenesmus (7 cases; 1.4%). Moreover, grade III or grade IV mucosal-hemorrhoidal prolapse recurrences developed in 18 patients (3.6%). No active rectal bleeding or suture line dehiscence was found during the outpatient visits. There are 55 cases (10.9%) who received re-entry surgery; 4 cases (0.8%) required to check bleeding; 26 cases (5.2%) with anal stenosis and obstructed defecation after SH, they underwent trans-anal release of the stricture, removing staples at the 3 and 9 o'clock positions; 13 cases (2.6%) underwent RBL; 7 cases (1.4%) underwent Ferguson's hemorrhoidectomy, and five (1%) underwent SH again. Few patients reported severe pain after one week of treatment. About 90% satisfaction was recorded for SH one year after surgery.
Conclusion. Although many post-operative complications were recorded, our study demonstrated that SH became a primary method to treat the prolapse of internal hemorrhoids due to high patient satisfaction and a lower risk for complications. We also shared our experience to performed anoplasty for patients with anal stenosis after SH successfully. Further large-scale prospective studies are needed to investigate these complications and compare different methods of managing prolapsed hemorrhoids.
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Hemorrhoids are typical cushion structure in anal canal. It has been estimated that nearly 5% of the general population is affected by symptoms related to hemorrhoidal disease (HD). HD is widely considered as a disorder causing the prolapse of the anal hemorrhoidal cushions. The vascular cushions are composed of fibroelastic tissue, muscle fibers, and vascular plexuses with arteriovenous anastomoses; they may cause pain, swelling, bleeding, itching, and fecal soiling. Approximately 50% of people over the age of 50 have experienced symptoms related to hemorrhoids.[1] Studies have shown that symptomatic hemorrhoids are more common in people who have a higher socioeconomic status and a low-fiber diet; it equally affects men and women.[2-6]

Hemorrhoids may be classified into internal, external, or mixed. Patients with hemorrhoids often seek medical advice owing to bleeding during or after defecation, peri-anal pain, or itching sensation and prolapse. Conservative treatments include lifestyle modification (e.g., increased dietary fiber and fluid intake). The use of medications (e.g., ointments and suppositories) can relieve irritation and pain but usually for a short period. When there is no apparent clinical improvement, more invasive treatment methods are required; this may include: rubber band ligation (RBL), infrared photocoagulation, sclerotherapy, cryotherapy, manual anal dilatation, LASER hemorrhoidectomy, the harmonic ultrasonic scalpel hemorrhoidectomy, or doppler-guided hemorrhoidal artery ligation. All of the above treatment methods are considered more effective for the first- and second-degree hemorrhoids patients who presented with minor symptoms. However, operative hemorrhoidectomies are generally reserved mainly for symptomatic third- and fourth-degree hemorrhoids patients, or patients with acute hemorrhoids that have not significantly improved by other therapies.[7]

Hemorrhoidectomy (excision of hemorrhoids) is considered to be the major treatment method for patients with symptomatic third- and fourth-degree hemorrhoids. Milligan-Morgan's method (open hemorrhoidectomy) and Ferguson's procedures (closed hemorrhoidectomy) are the most practiced and well-accepted procedures globally; they have excellent treatment outcomes for hemorrhoidal bleeding and prolapse. Although these techniques are thought to be safe, simple, and cost-effective, they are associated with complications such as post-operative pain, acute urine retention, and bleeding.[8] To reduce pain and other complications, many studies have investigated the physiology and anatomy of HD.

A new procedure, stapled hemorrhoidopexy (SH), had been introduced by Antonio Longo in 1998; it is known as circumferential mucosectomy or procedure for prolapse and hemorrhoids (PPH). It does not effectively treat most external hemorrhoids but treats the prolapse of internal hemorrhoids. Nevertheless, it has been widely accepted due to the absence of superficial surgical wounds and an association with lower post-operative pain, less bleeding, fewer cases of urinary retention, faster operative time, and a much quicker return to normal activities. Finally, the SH is completed by resecting any excess mucosa and mucomucous anastomosis fixed at the rectal wall. However, the specialized device makes this procedure more expensive.

Although the short-term complications from SH have been well documented, data describing long-term complications from SH is still limited. To expand the understanding of clinical outcomes and patient satisfaction, we reviewed our five year experience with this procedure. We investigated meaningful experiences from our center and recorded the need for re-entry surgeries with the analysis of complications.

Materials and Methods

This retrospective cohort analysis was conducted on prospectively collected data, including consecutive patients who underwent SH at Songshan Branch, Tri-Service General Hospital, National Defense Medical Center between January 1, 2012, and December 31, 2016, four colorectal surgeons in our hospital.

Eligibility

All patients who underwent SH for grade III and IV mucosal-hemorrhoidal internal prolapse, accord-

ing to the Goligher classification, were included in this study. Patients who underwent other surgical procedures (i.e., Milligan-Morgan's hemorrhoidectomy, hemorrhoidal artery ligation, or stapled trans-anal rectal resection) and grade I or II hemorrhoids were not included. Patients affected by hemorrhoidal thrombosis, other anal pathologies (e.g., anal fissure), IBD, anal incontinence (continence grading system > 8), and/or anal stenosis were not included in this study. Patients who had a previous hemorrhoidectomy, previous rectal anastomosis, or history of pelvic radiotherapy were also not included in this study. Patients on oral anticoagulant or antiplatelet therapy and those affected by coagulation disorders were not included in this study; they required hemorrhoidectomy with careful pedicle ligation to better control any possible bleeding and avoid developing retrorectal hematoma. Patients who died during the follow-up or who refused the one year examination were excluded from the analysis. From 2012 to 2016, 501 patients fit the inclusion criteria and were enrolled in this study.

Pre-operative management

The pre-operative evaluation included clinical and proctologic examinations. During the clinical examination, the following variables were collected: age, sex, grade of hemorrhoidal disease, previous treatments (RBL), local symptoms, continence disorders, and defecatory disorders (e.g., obstructive defecation syndrome or slow-transit constipation). The proctologic examination included a digital rectal examination, anoscopy, and rectoscopy. Patients were evaluated both at rest and during straining. The severity of HD was recorded according to the Goligher classification. In addition, all patients reporting rectal bleeding during the clinical examination received a complete colonoscopy to exclude the presence of colorectal cancer, IBD, other forms of colitis, diverticular disease, or angiodysplasia. We recorded this prospective data into an electronic database.

Surgical technique

The surgical technique was previously described

in detail (see Introduction). We performed this procedure under general anesthesia, with a single dose of intravenous antibiotics (cefotaxime) administered at the induction of anesthesia as prophylaxis against wound infection and pelvic sepsis. Patients were placed in the jackknife position. A circular anal dilator was inserted into the anal canal and secured to the perianal skin with four stay sutures. One circumferential purse-string suture was placed above the dentate line, through the mucosa and submucosa, 2 cm above the hemorrhoidal apex (upper anal canal). A 33-mm circular stapler (PPH-03, Ethicon Endo-Surgery, Inc, Pomezia, Italy) was inserted, closed, and fired. In female patients, before firing the stapler, it was confirmed that the posterior wall of the vagina was not trapped in the instrument. The suture line was then controlled to evaluate whether ≥ 1 hemostatic stitch was needed to control the bleeding. A hemostatic gauze plug was post-operatively left in anal canal. The surgical procedures were performed by four experienced proctologic surgeons with ≥ 5 years of practice who had completed a minimum of 50 SHs per year.

Post-operative follow-up

The patients received scheduled clinical and proctologic examinations at the outpatient clinic 1, 2, and 4 weeks after surgery. After that, regular inspections were carried out on patient demand. Patients were contacted by telephone at their 1-year follow-up and were invited to the outpatient clinic for an ultimate evaluation. As for the pre-operative workup, the patients underwent clinical and proctologic evaluation, including digital rectal examination and anoscopy. The latter was performed both at rest and during straining to better define the hemorrhoidal grade by Goligher classification. Patients who have had any kinds of stool leakage during follow-up period and those who reported urge to defecate at the 1-year visit were referred for manometry to evaluate the function of anal sphincter including fecal incontinence, chronic constipation, or anal tonicity. Endoanal ultrasound was further performed if a newly developed lesion near sphincter was suspected. Finally, Ferguson's hemorrhoidectomy and PPH were proposed to the pa-

tients affected by recurrence.

Parameters evaluated

Pre-operative, intra-operative, and post-operative parameters were analyzed. Recurrence was defined as a new mucosal-hemorrhoidal prolapse that was at least the same grade as the pre-operative one (i.e., grade III and IV hemorrhoids according to the Goligher classification). Symptomatic prolapse was defined as a prolapse that caused ≥ 2 of the following symptoms: bleeding, tenesmus, and soiling.

Patients satisfaction was assessed by telephone inquiry with satisfaction survey questionnaires, using a 10-point rating scale ranging from 1 (dissatisfied) to 10 (very satisfied). The satisfaction scores were grouped into four categories: very satisfied (8-10), satisfied (6-7), poorly satisfied (3-5), and dissatisfied (1-2).

Statistical analysis

Patient characteristics are summarized using total numbers, percentages, and mean ± standard deviation. Analysis was performed using SPSS version 21 (IBM SPSS Inc., Armonk, NY).

Approval and consent

All procedures performed in this study were under the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. All participants obtained informed consent.

Results

Surgery and short-term 1 year follow-up

Patient demographics and characteristics are listed in Table 1. We analyzed 501 consecutive patients: 183 men (36.6%) and 318 women (63.4%) who underwent SH, for grade III and IV mucosal-hemorrhoidal prolapse between January 1, 2012, and De-

cember 31, 2016. The median age of the patients was 52.2 ± 13.5 years (range: 33-87 y). The grade III to IV ratio was 172:329 (34.4%:65.6%). The mean time of discharge from the hospital was 2.3 ± 0.5 days, the mean blood loss was 5.3 ± 3.2 ml, and the mean operative time was 17.8 ± 5.1 min. There are 227 patients (45.4%) undergone previous hemorrhoidal RBL without success. To alleviate symptoms caused by hemorrhoids, oral treatments (e.g., high-fiber diet, adequate fluid intake, probiotics, phlebotonics, and nonsteroidal anti-inflammatory drugs) were administered to symptomatic patients.

The overall surgical complications cases were 95 patients (19%), there are 41 patients (8.2%) who received urinary catheterization due to urinary retention. Seven patients (1.4%) presented with fecal urgency and tenesmus; seven patients (1.4%) presented

Table 1. Demographic of patient characteristics and complications

Total number of patients	501
Age (years)[a]	52.2 ± 13.5 (33-87)
Sex (male/female)	183/318 (36.6/63.4%)
Operation time (mins)[a]	17.8 ± 5.1
Blood loss (ml)[a]	5.3 ± 3.2
Hospital course (day)[a]	2.3 ± 0.5
Previous RBL[b]	227 (45.4%)
Hemorrhoids (Grade III/IV)	172/329 (34.4/65.6%)
Complication	
Total number of complication, n (%)	95 (19%)
Post-operation bleeding, n (%)	10 (2%)
Urine retention, n (%)	37 (7.4%)
Urine retention and bleeding, n (%)	1 (0.2%)
Urine retention and anal stenosis, n (%)	3 (0.6%)
Post-operative fever, n (%)	7 (1.4%)
Anal thrombosis, n (%)	7 (1.4%)
Anal stenosis, n (%)	23 (4.6%)
Fecal urgency/tenesmus, n (%)	7 (1.4%)
Recurrence (Grade III/IV)	18 (3.6%)
Re-entry surgery	
Total number of re-entry surgery, n (%)	55 (10.9%)
Check bleeding, n (%)	4 (0.8%)
Anoplasty, n (%)	26 (5.2%)
RBL, n (%)	13 (2.6%)
PPH[c], n (%)	5 (1%)
Ferguson's surgery, n (%)	7 (1.4%)

[a] Mean value. [b] Rubber band ligation. [c] Procedure for prolapse and hemorrhoids.

with post-operative fever, and seven patients (1.4%) suffered from anal thrombosis formation over the peri-anal region. However, no anal sphincter lesions were found with endoanal ultrasound and anal manometry in these patients. Eighteen patients (3.6%) presented with grade III or grade IV mucosal-hemorrhoidal prolapse recurrences developed. No active rectal bleeding or suture line dehiscence was found at discharge and during the outpatient visits at 1, 2, or 4 weeks after the surgical procedure.

There are 55 cases (10.9%) who received re-entry surgery. Four patients (0.8%) required re-operation for suture line bleeding, controlled with resorbable stitches. Seven (1.4%) patients underwent Ferguson's hemorrhoidectomy, and five (1%) underwent SH again. There are also 13 patients (2.6%) who received RBL after PPH. We also report 26 patients (5.2%) with anal stenosis and obstructed defecation after PPH. The presenting symptoms included evacuation difficulty, rectal pain, and urgency. All had scarring and stenosis at their PPH anastomotic staple line. These patients underwent trans-anal stricture release with the removal of staples at the 3 o'clock and 9 o'clock positions, with subsequent refashioning of the anastomosis.

The pain distribution is shown in Table 2. All of the patients complained of pain on the first day, then 60.2% complained of pain on the third day, and then this was reduced to 22.1% by the seventh day. About 8% (n = 40) of the patients suffered from more severe pain, reporting Visual Analogue Scale scores above 5 three days after SH. However, we found significant improvements in pain; only about 4% (n = 20) of the patients suffered from more severe pain.

Satisfaction with SH was recorded in 450 patients; 51 patients did not answer the query. Table 3 shows patients satisfaction divided into four groups: very satisfied (8-10: 228; 50.7%), satisfied (6-7: 154;

34.2%), poor satisfied (3-5: 41; 9.1%) and dissatisfied (1-2: 27; 6.0%). In conclusion, about 90% satisfaction was recorded by queries about SH 1 year after surgery.

Discussion

There are many ways of treating patients with symptomatic hemorrhoids, although clinicians always recommend prevention as the best treatment. Our study conducted 501 patients who suffered from grade III and IV mucosal-hemorrhoidal prolapse between January 1, 2012, and December 31, 2016. SH had become a prominent method to treat the prolapse of internal hemorrhoids owing to high patient satisfaction and a lower risk for complications.

Patients with grade I and II hemorrhoids are usually treated on an outpatient basis; however, if the symptoms are not well-controlled, they will usually seek further interventions to achieve complete relief from symptoms. Currently, there are many operative options, including: the clamp and cautery hemorrhoidectomy; open hemorrhoidectomy (Milligan-Morgan's method); closed hemorrhoidectomy (Ferguson's procedures); submucosal hemorrhoidectomy; whitehead circumferential hemorrhoidectomy; SH; radiofrequency ablation and suture fixation hemorrhoidectomy; pile suture method; the bipolar diathermy/LigaSure hemorrhoidectomy; and several others.[7]

Hemorrhoids are rarely life-threatening; however, there are many possible post-operative complications. By understanding the potential surgical hazards, it is much easier to provide patients with options and allow them to make appropriate, informed choices. The following potential risks must be considered: post-op-

Table 2. Post-operative distribution of pain score on visual analogue score on the first week

VAS	1	2	3	4	5	6	7	8	9	10
Day 1	110	115	137	99			40			
Day 3	25	100	107	30			40			
Day 7		15	56	20	20					

Table 3. Satisfaction survey of surgery one year later by telephone inquiry with satisfaction survey questionnaires

Total number of satisfaction survey	450 (100%)
Very satisfied (8-10)	228 (50.7%)
Satisfied (6-7)	154 (34.2%)
Poor satisfied (3-5)	41 (9.1%)
Dissatisfied (1-2)	27 (6.0%)

erative pain; wound infection; bleeding; edema of the skin bridges; incontinence; difficult urination or urinary retention; delayed hemorrhage; anal stenosis; and recurrence.[1,8]

SH is currently widely accepted and has become a prominent method for treating the prolapse of internal hemorrhoids. This method is favorable due to the alleviation of post-operative pain, the shorter operation duration, shorter hospital stays, and earlier recovery and ability for the patients to return to work compared to conventional hemorrhoidectomy (CH).[9] However, a recent meta-analysis of 1343 patients had revealed higher recurrence rates and re-operation risks from PPH in the long-term.[10] Bellio et al.,[11] published that the recurrence rate was as high as 39% in the ten years after an SH procedure; this was slightly higher than other articles, owing to different classifications of recurrence. Conversely, another study demonstrated a 14.7% re-operation rate for recurrence by five years follow up.[12] In our experience, the overall recurrence rate for grade III and IV mucosal-hemorrhoidal prolapse is 3.6% within one year followed up. In our study, 55 patients (10.9%) received re-entry surgeries, but the rate of grade III and IV recurrence was merely 2.4% (n = 12), including 7 patients who underwent Ferguson's hemorrhoidectomy and 5 patients who underwent SH. Although the rate of our re-entry surgery was similar to those in other studies,[13,14] to thoroughly investigate the main factors, we included anoplasty, check bleeding, SH, Ferguson's hemorrhoidectomy, and RBL into re-entry surgery. An interesting point had been postulated that, compared with CH, SH reduces the size of the prolapsed tissue without actually removing the hemorrhoids. In actuality, SH partially interrupts the hemorrhoid tissue's blood supply and resects the mucosal prolapse, lifting the hemorrhoid cushions back into their anatomical position. Therefore, SH will not get rid of prolapsed hemorrhoid tissue; it can only solve the mucosal-hemorrhoidal prolapse, consequently improving patient symptoms. Thus, SH partially reduces the severity of the disease but cannot eradicate it. Moreover, the extramural hemorrhoidal vascular branches remain after SH and can cause the new development of prolapse tissue, leading to recurrence.[15,16]

Previous studies have reported that patients who underwent SH presented with five times more symptomatic hemorrhoids than CH.[17,18] Another study also reported that early complications, such as bleeding and urine retention, can be treated during hospitalization; however, long-term outcomes of SH are insufficiently acknowledged, especially the prevalence of persistent skin-tags and recurrent prolapse.[19] Fecal urgency and tenesmus were observed in some studies that required surgical treatment.[20,21] In our study, seven patients (1.4%) presented with fecal urgency and tenesmus; we performed manometry and endoanal ultrasound examinations for them but did not find anal sphincter lesions. They all recovered smoothly after some outpatient visits and treatments.

The prevalence of painful sensations after surgery has been described in many studies (acute or chronic pain). They had explained that it may be caused by the over-suturing of the staple line or by retained staples.[19,20,22] In our study, patients presented with severe painful sensations during the first three days after surgery, but there was a substantial improvement in pain relief after one week of treatment.

Stenosis is a rare, long-term complication of SH; researchers have reported the incidence is less than 5%. It might be caused by removing disproportionate tissue without leaving mucosal bridges between the surgical wounds around the anal canal, causing over-scarring and stricture formation.[23,24] Some centers shared their experiences with treating stenosis by using perianal skin and subcutaneous fat in a tension-free manner, producing a tension-releasing wound.[25,26] We reported 26 patients (5.2%) with symptomatic anal stenosis after PPH. We modified our strategy, so these patients received further anoplasty with the trans-anal release of the stricture, removing the staples over 3 o'clock and 9 o'clock, and the subsequent refashioning of the anastomosis (regardless of mild or severe stenosis). Similar viewpoints about partial SH were discussed for many years; fewer staples are used, so it preserves the mucosal bridges and lessens the risk for some of the complications (e.g., anastomotic stenosis, rectovaginal fistula, and defecatory dysfunction) compared with conventional circumferential SH.[27] A recent study by Lin et al.[26] demonstrated that

partial SH was associated with reduced post-operative pain and urgency, better post-operative anal continence, and minimal risk of rectal stenosis.

Both CH and SH are most frequently used to treat symptomatic hemorrhoids. A large randomized controlled trial compared these two techniques directly. SH resulted in less pain than CH in the initial six weeks post-surgery; however, patients treated with SH reported worse incontinence, tenesmus, hemorrhoid symptoms, and more hemorrhoid recurrences under long-term tracking.[28] However, our study shows that this strategy for SH can achieve a high level of patient satisfaction; about 90% satisfaction with SH was recorded by queries one year after surgery. Due to less post-operative pain, less urinary retention rate, and effective symptom control, the patient can return to a normal life state relatively quickly. Our data also revealed a low rate of re-operation for recurrent hemorrhoidal symptoms one year after surgery; similar results are recorded by another center's study.[29] Our study yielded pre-operative and post-operative outcomes comparable to those of the currently published series about SH.[13,14,30] Compared with other studies, we do not have more complications, and we have a high degree of satisfaction (Table 4).

Table 4. Summary of reported stapled hemorrhoidopexy study series

Study	Our series	Bhuiyan MJ, et al.[23]	Schneider R, et al.[24]	Sturiale A, et al.[25]
Number of cases	501	160	117	171
Duration period	2012.01-2016.12	2015.07-2019.06	1999.05-2003.12	2003.01-2005.12
Follow up (year)[a]	1	0.5	15.2 ± 1.6 (11.8-18.1)	12 ± 0.8 (11-13)
Male/female	183/318 (36.6/63.4%)	111/49 (69.4/30.6%)	78/39 (66.7/33.3%)	91/80
Age (years)[a]	52.2 ± 13.5 (33-87)	40.9 (17-76)	65.8 ± 10.6 (46-87)	54 ± 8.4 (31-67)
Hemorrhoidectomy techniques	PPH 03 stapler	PPH 03 stapler	PPH 01 stapler	PPH 03 stapler
Anesthesia	General	Spinal	General or Spinal	No data
Prophylaxis antibiotic	Cefotaxime	Cefriaxone and Metronidazole	No data	No data
Position	Jackknife position	Lithotomy position	No data	No data
Operation time (mins)[a]	17.8 ± 5.1	30 (20-45)	No data	26 ± 5.8
Blood loss (ml)	5.3 ± 3.2	No data	No data	No data
Hospital course (day)[a]	2.3 ± 0.5	1.5 (1.0-2.0)	No data	1.18 ± 0.58
Pre-operative				
Previous RBL	227 (45.4%)	No data	No data	No data
Hemorrhoids (Grade)	Gr. III/IV: 172/329 (34.4/65.6%)	Gr. I/II/III/IV: 3/10/118/29 (1.9/6.3/73.8/18.1%)	Gr III: 100%	Gr. II/III: 9/162 (5.3/94.7%)
Complications				
Dehiscence	None	None	None	None
Post-operative bleeding	11 (2.2%)	6 (3.75%)	37 (31/6%)	7 (4.1%)
Acute urine retention	41 (8.1)	None	None	6 (3.5%)
Fever	7 (1.4%)	None	None	None
Anal thrombosis	7 (1.4%)	None	None	1 (0.6%)
Anal stenosis	26 (5.2%)	None	9 (7.7%)	3 (1.7%)
Feaecal urgency/tenesmus	7 (1.4%)	None	21 (17.9%)	67 (39.1%)
Persistence or recurrence (Gr. III and IV)	Recurrence: 18 (3.6%)	Persistence: 2 (1.25%)	Recurrence: 24 (20.5%)	Recurrence: 70 (40.9%)
Pain persist	0	5 (3.12%)	16 (13.7%)	4 (2.3%)
Re-entry surgery	55 (10.9%)	None	17 (14.5%)	10 (5.8%)
Check bleeding	4 (0.8%)	None	None	3 (1.7%)
Anoplasty	26 (5.2%)	None	None	7 (4.0%)
RBL	13 (2.6%)	None	2 (1.7%)	None
SH	5 (1%)	None	2 (1.7%)	None
CH	Ferguson's surgery: 7 (1.4%)	None	Milligan-Morgan's: 13 (11.1%)	16 (9.3%)
Satisfaction	1 year: 382 (84.9%)	High (Not mention in detail)	15 year: 102 (87.2%)	12 year: 139 (81.2%)

[a] Indicates mean value (range).
RBL: Rubber band ligation; SH: stapled hemorrhoidopexy; CH: conventional hemorrhoidectomy.

Notwithstanding the strengths of our study, the present study had several limitations. First, we enrolled 501 cases over five years, which produced a small sample size, and did not have a control group. Additionally, the follow-up period was too short; many complications may not have occurred yet, leading to the underestimation of complications among patients. Second, information on important confounders for the associated risks (e.g., family history, obesity, smoking habits, consumption of alcohol, dietary patterns, Type 2 diabetes mellitus, hypertension, and many other comorbidities) were not well-recorded; the confounding effect may only be partially excluded. Third, we did not mention cost-effectiveness as our hospital is situated at the center of Taipei, Taiwan, which serves a relatively small but populated area that has a higher level of national income. Further large-scale prospective studies are needed to investigate these results and to compare different treatments of prolapsed hemorrhoids.

Conclusion

Although many post-operative complications were recorded, our study demonstrated that SH became a primary method to treat the prolapse of internal hemorrhoids due to high patient satisfaction and a lower risk for complications. Some complications could be solved during hospitalization, but some needed re-operation (e.g., recurring hemorrhoids, anal stenosis, and anal bleeding). We postulated the solution to solve complications for patients with anal stenosis after SH: anoplasty, removing staples in the 3 and 9 o'clock position. Patients may be informed of the possible complications that may seldom happen while offering SH for more severely symptomatic patients. SH is safe with many short-term benefits; however, the long-term results should be further investigated.

Sources of Financial Support

Conflict of Interest

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原　　著

以痔瘡環狀切除手術治療第三、四級痔瘡患者術後高滿意度結果分析

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目的　針對第三、四級有症狀痔瘡患者，接受痔瘡環狀切除手術 (SH) 後併發症分析，及術後肛門狹窄的治療經驗。

方法　以回溯性世代研究，統計 2012 年 1 月到 2016 年 12 月，501 例接受 SH 治療。

結果　501 例接受 SH 個案，女性高於男性，第四級痔瘡比第三級常見。有 95 例手術併發症 (19%)：包括術後出血、尿滯留、術後發燒、肛門血栓、狹窄、裡急後重。此外，18 例 (3.6%) 第三或第四級痔瘡復發。55 例 (10.9%) 接受重返手術：包含止血手術、肛門狹窄整形術、橡皮筋結紮、再次傳統痔切除及 SH。很少患者在治療一周後劇烈疼痛。術後一年後，患者對 SH 滿意度約為 90%。

結論　SH 作為治療內痔脫垂的主要方法，因術後滿意度高且併發症風險較低。我們更分享 SH 後，肛門狹窄患者接受肛門整形術的經驗。

關鍵詞　第三級痔瘡、第四級痔瘡、痔瘡環狀切除手術、術後併發症、滿意度。