

Reinterventions for Specific Technique-Related Complications of Stapled Haemorrhoidopexy (SH): A Critical Appraisal

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Abstract

Introduction Stapled haemorrhoidopexy (SH) is an attractive alternative to conventional haemorrhoidectomy (CH) because of reduced pain and earlier return to normal activities. However, complication rates are as high as 31%. Although some complications are similar to CH, most are specifically technique-related. In this prospective audit, we report our experience with the management of some of these complications.

Methods Data on patients undergoing SH at our unit or referred to us are prospectively entered in a database. The onset or duration of specific SH-related complications as well as reinterventions for failed or complicated SH was recorded.

Results From 1/03 to 10/07, 110 patients underwent SH, while 17 patients were referred after complicated/failed SH. Overall early and late complication rates after SH were 12.7% and 27.2%, respectively. Overall reintervention rate was 9.1%. Among the referred SH-group, one patient underwent Hartmann's procedure because of rectal perforation. The remaining 16 patients experienced at least one of the following: recurrence, urgency, frequency, severe persistent anal pain, colicky abdominal pain, anal fissure and stenosis. Four patients underwent CH with regular postoperative recovery. Two patients underwent exploration under anaesthesia because of persisting pain. One patient underwent anoplasty.

Conclusions SH presents unusual and challenging complications. Abuses should be minimized and longer-term studies are needed to further clarify its role.

Keywords Haemorrhoidopexy · Haemorrhoids · Outcome

Introduction

Stapled haemorrhoidopexy (SH) is an attractive alternative to conventional haemorrhoidectomy (CH) because of reduced postoperative pain, shorter hospital stay and earlier return to

normal activities. Over the last decade, SH gained wide acceptance, with over 50,000 patients treated in Europe.^{1,2}

However, this enthusiastic use has been tempered by increasing reports of unusual complications, including several cases of pelvic life threatening sepsis and deaths.^{3,4} Although several complications are similar to CH, some are technique-related such as longer-term anal pain (post-evacuation syndrome or persistent anal pain), longer-term tenesmus with urgency and or frequency, haemorrhoidal recurrence (early as thrombosis or late recurrences), recto-vaginal fistula, anastomotic leakage, rectal perforation and pelvic sepsis.⁵⁻⁷ In this brief prospective audit, we report our experience with the management of some of these complications after SH.

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Patients and Methods

Between January 2003 and October 2007, 425 symptomatic patients underwent haemorrhoidectomy at our institution

and data entered prospectively in a database. Of those, 110 underwent SH (66 M, 44 F, mean age 44 years, ranging from 21 to 75 years) while 315 underwent conventional haemorrhoidectomy (186 M, 129 F, mean age 48 ranging from 24 to 72 years). Mean follow-up period after surgery was similar between the two groups being respectively 25 ± 14 months after SH and 32 ± 16 months after CH. Before surgery, all patients underwent digital examination and proctoscopy. Preoperative Wexner continence score was performed in all patients. Colonoscopy, anorectal manometry and/or ultrasonography (US) were performed if necessary. All surgeries were performed in a Day Care setting, in lithotomy position under local anaesthesia and, when necessary, general anaesthesia was provided. All patients received a phosphate enema 2 h before the operation.

Antibiotic prophylaxis was administered using intravenous *cephalosporin* (1 g) and *metronidazole* (500 mg) immediately before surgery. Starting May 2006 our protocol was revised and a single-antibiotic regimen replaced the previous one using intravenous *cefotaxime* (2 g).

The procedure was performed according to the technique described by Longo⁶ using the PPH01 kit (Ethicon EndoSurgery) with no modifications or additional procedures.

All resected specimens were sent for pathology examination. Mucosal doughnuts retrieved from the stapler were orientated and sent for pathology. As previously described, the macroscopic appearance of the specimen (shape, size and depth) was recorded. Microscopically, the presence of columnar, transitional and squamous epithelium, the involvement of circular/longitudinal smooth muscle as well as features of mucosal prolapse, was assessed.

Patients were discharged from the unit 4 to 8 h after the procedure with oral and written instructions for postoperative care including medications (non-steroidal anti-inflammatory drugs per os), antibiotics (quinolones twice a day for 5 days per os) and stool softeners for 7 days. Warm sitz baths were suggested.

Patients were seen after 1 week and pain assessed using a 10-cm linear visual analogue scale (VAS). Further controls were scheduled at 1, 3 and 12 months or if required. All patients were contacted annually thereafter. Clinical outcome was assessed by a validated questionnaire on postoperative symptoms and satisfaction supplemented by the Wexner continence score.

During the same period of time, 23 patients were referred to our colorectal unit after complicated CH or SH performed elsewhere: six after CH (four F, two M) and 17 (11F, six M; mean age 47 years) after SH. The onset and duration of specific SH-related complications as well as reinterventions for failed and or complicated SH were recorded.

Results

Operating time between SH and CH was similar being 28.3 ± 8.7 and 26 ± 8.8 min, respectively ($p=0.111$). Hospitalization rates were similar between SH and CH being 2.7% and 1.6%, respectively ($p=0.449$).

Likewise, no differences were observed in terms of ER admissions (7.3% vs 3.8%, $p=0.214$) and hospital readmissions (3.6% and 2.2%, $p=0.414$) between SH and CH.

Overall early (<30 days from surgery) and late (>30 days) complication rates were similar between SH and CH as shown in Tables 1 and 2.

Despite an increased quote of anal fissure, disabling chronic pain and recurrences were observed after SH when compared to CH, no significant differences were observed in terms of early and late complications between SH and CH as shown in Tables 1 and 2.

Mean pain during the first postoperative week expressed as VAS is shown in Fig. 1. Significant differences were observed from postoperative days 4 to 7.

As shown in Fig. 2, patients who underwent CH experienced more severe pain (expressed as VAS score > 7) than SH at 5, 6 and 7 postoperative days. We did not observe differences between SH and CH in terms of postoperative pain and severe pain (VAS > 7) among third and fourth degree haemorrhoids.

Postoperative symptoms duration including pain, bleeding, soiling and hitching lasted more after CH compared to SH reaching significant differences for soiling and bleeding as shown in Fig. 3.

Postoperative fever was similar between the two groups. No differences were observed in terms of return to work expressed in days between the two groups. Longer-term follow-up results of symptoms duration is shown in Table 3.

Urgency after 3 months was significantly more frequent after SH compared to CH (8.2% vs 0.6%), despite this difference disappeared at 1 year (0.9% vs 0.3%).

Three patients (2.7%) experienced severe disabling chronic pain after SH that lasted >1 year since surgery without the expected improvement over the follow-up. All patients described the pain as sharp, recurrent, starting

Table 1 Early Complications (<30 days)

Complications	SH (n/%)	CH (n/%)	P value
Urinary retention	3/2.7%	5/1.6%	0.449
Bleeding	5/4.5%	9/2.8%	0.394
Faecal retention	1/0.9%	5/1.6%	0.604
Haem. thrombosis	2/1.8%	1/0.3%	0.106
Incontinence	3/2.7%	7/2.2%	0.090
Infection	0	3/0.9%	0.305
Overall	14/12.7%	30/9.5%	0.343

Table 2 Late Complications

Complications	SH (n/%)	CH (n/%)	P value
Disabling pain (>1 year)	3/2.7%	2/0.6%	0.082
Recurrence	6/5.4%	5/1.6%	0.133
Stenosis	2/1.8%	10/1.2%	0.460
Anal fissure	6/5.4%	7/2.2%	0.090
Abscess/fistula	0	2/0.6%	0.403
Skin tags	13/11.8%	41/13.2%	0.746
Overall	30/27.2%	67/21.2%	0.197

within 30 min from defecation and lasting for 2 to 5 h without bleeding or mucous discharge. In all cases, the rectal examination was unremarkable and anal fissure was ruled out. All patients underwent anal manometry that did not show significant abnormalities (only one patient was found to have mild internal anal sphincter hypertonia) as well as endorectal ultrasound that showed normal anatomy in all. A working diagnosis of post-defecation syndrome was made in all and calcium channel blockers ointment given twice a day for 8 weeks. This treatment was effective in all but one who presented worsening persistent pain described as sharper after defecation. In this case oral nifedipine was ineffective and ano-rectal exploration under anaesthesia was performed. At surgery, the staple line was correctly placed and the only finding was the presence of retained staples which were removed with complete pain resolution within 2 weeks. SH complications and their management resumé is shown in Table 4.

Early haemorrhoidal recurrences (as thrombosis) occurred 4 and 12 days after surgery. Both cases responded to standard medical treatment and did not present any other episode during the follow-up. Six patients developed late haemorrhoidal recurrence after 16±5 months from previous surgery (range 9–26 months). All recurrences were observed in patients who underwent SH for fourth degree haemorrhoids. Main symptoms were bleeding (six patients) and prolapse (four patients). One patient was successfully treated with rubber banding while surgery was offered to

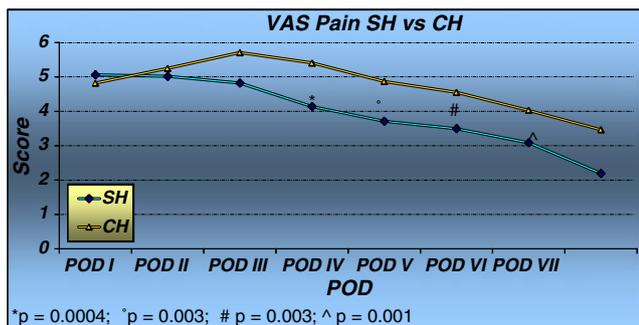


Figure 1 Pain SH vs CH (expressed as VAS score mean).

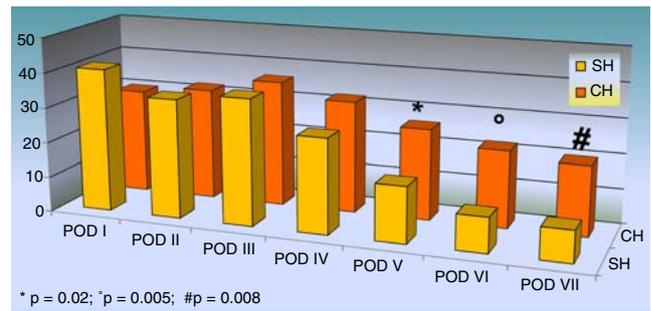


Figure 2 Severe postoperative pain (expressed as % of patients with VAS > 7).

the remaining five: one patient refused and four underwent uneventful CH (two closed and two open).

Twelve patients experienced transient urgency (10.9%) that resolved within 4 months in all patients but one in which lasted 13 months. Two patients (1.8%) developed symptomatic rectal stricture with urgency and frequency and responded to anal dilatation with anal dilators. As shown in Table 5, overall reinterventions rate after SH was 9.1% (vs 4.8% of CH, not significant). Figure 4 shows the estimated risk of reinterventions after SH and CH. Table 6 shows summary of complications and management among the referred patients.

Among the referred SH group, one patient developed severe pelvic sepsis after SH performed as a day case procedure. She complained lower quadrants abdominal pain associated to nausea, vomit and fever the night following hospital discharge. She was admitted in our emergency unit because of acute abdomen. Signs of severe sepsis were present and computed tomography (CT) scan showed pneumoretroperitoneum. At laparotomy, mesorectal and retroperitoneal emphysema were present with minimal amount of pus, in absence of an evident low rectal

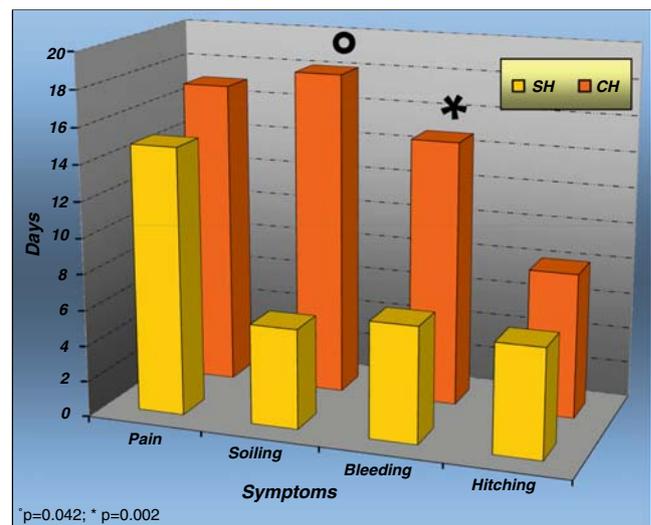


Figure 3 Postoperative symptoms duration.

Table 3 Longer-term Follow-up and Symptoms Duration

Parameter	SH (n/%)	CH (n/%)	P value
Fever (>38°C)	4/3.6%	14/4.4%	0.821
Bleeding at 3/12	2/1.8%	5/1.6%	0.870
Urgency at 3/12	9/8.2%	2/0.6%	0.045
Pain at 3/12	3/2.7%	4/1.2%	0.175
Bleeding at 1 yr	1/0.9%	2/0.6%	0.967
Urgency at 1 yr	1/0.9%	1/0.3%	0.436
Pain at 1 yr	3/2.7%	2/0.6%	0.082
Satisfaction (score 4/4)	85%	66%	0.051
Return to work (days)	17.3±11.7	17.5±10.8	0.856

perforation. After accurate washout, a Hartman’s procedure was performed and a drain left in the pelvis. Postoperative recovery was uneventful, she was discharged after 8 days and uneventful reversal was performed 6 months later.

Ten of the remaining 16 patients experienced at least one of the following symptoms or complications: recurrence,⁶ urgency,⁶ severe chronic anal pain,⁴ tenesmus,⁴ colicky abdominal pain,¹ anal fissure¹ and stenosis.¹

Recurrences were observed after 17±6 months from surgery (range 9 to 36 months). Main symptoms were bleeding (six patients), prolapse (four patients) and pain (one patient). Four patients accepted surgery and underwent conventional haemorrhoidectomy (three closed, one open) and had a regular postoperative recovery.

Four patients came to our attention because of persistent pain lasting for 7±6 months after SH. In one case, an anal fissure was present and successfully treated with lateral internal sphincterotomy after manometric confirmation of internal sphincter hypertonia and failure of GTN ointment course of 8 weeks. Topical treatment with calcium channel blockers ointment (twice a day for 8 weeks) was started in all. One patient required oral nifedipine. However, conservative medical treatment was ineffective in two patients, who underwent exploration under anaesthesia (EUA). Before reinterventions anorectal manometry and ultrasound were performed in both and pelvic magnetic resonance imaging (MRI) in one. In one patient, the US showed a

small (1 cm) submucosal abscess at the stapled line. The abscess was not seen at the MRI, and it was not found at EUA. However, in both patients, surgical removal of retained staples resolved the pain within 4 weeks.

One referred patient with anorectal stricture underwent anoplasty. In this case, asymmetric, very low stapled line was observed at surgery.

Discussion

Our experience confirms that SH is followed by reduced postoperative pain during the first week with overall early and late complications rates similar to CH. Postoperative symptoms duration is shorter after SH with a better patients satisfaction compared to CH. Differently from other authors report, in our experience the mean return to work period (expressed in days) was similar between SH and CH.^{8–10} We explain this similarity of results with the fact the our hospital serves a large Government employed (directly or indirectly) population with paid sick leave. Complications rates of SH range from 6.4% to 31%^{8,9} with a reintervention rate after 1 year of 11%.¹⁰ Some complications are similar to conventional haemorrhoidectomy such as bleeding, urinary retention, incontinence, fissure and stenosis. Others are specific-related to the technique, such as intra-abdominal or retroperitoneal bleeding, pelvic sepsis, tenesmus, severe chronic anal pain (chronic proctalgia or postdefecation syndrome), rectovaginal fistula and damage to sphincter mechanism.^{11–14}

Blouhos et al. reported a case of uncontrollable intra-abdominal bleeding necessitating low anterior rectal resection because of a small laceration in the anterior aspect of the rectum.¹⁵

The most dangerous complication reported after SH is pelvic sepsis, usually subsequent to rectal perforation or anastomotic leak. In a recent systematic review of life-threatening sepsis following haemorrhoidectomy, McCloud et al. described seven cases of life-threatening complications between 2000 and 2003 including abscesses, fistulae,

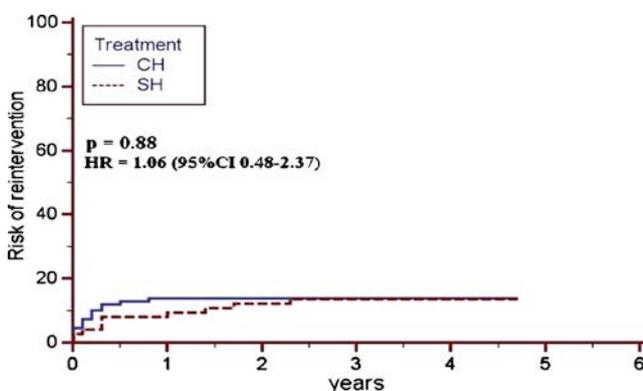
Table 4 SH Complications and Management Resume

Complications	Number (n)	Management	n/%
Bleeding	5	Conservative surgery 1	4/5
Thrombosis (at POD 4 and 12)	2	Conservative	Effective
Disabling pain (US, MRI, manometry)	3	Analgesic/Ca ²⁺ CB EUA	Topical, ¹ Oral ¹ Stapler removal effective ¹
Recurrence (16±5 months)	6	Medical/RBL Surgery-CH	1/2 RBL effective; 1 refused 2 Closed/2 open
Fissure	6	Medical (GTN) surgery	Effective 4/6 (66.7%) 2 LIS, effective
Stenosis	2	Dilators	Effective

Table 5 Number of Patients with a Complication (*N*) Requiring Reintervention (*n*)

Reintervention	SH n/N(%)	CH n/N(%)	<i>P</i> value
For pain	1/3(33.3%)	0/2	0.83
For bleeding	1/5(20%)	3/9(33.3%)	0.54
For skin tags	2/13(15.4%)	3/41(7.3%)	0.39
For anal fissure	2/6(33%)	4/7(57%)	0.43
For abscess/Fistula	0	2/2(100%)	0.79
For stenosis	0/2	2/10(20%)	0.84
For recurrence	4/8(50%)	1/5(20%)	0.31
cumulative	10/37(27%)	15/74 (20.3%)	0.64
OVERALL RATE	10/110(9.1%)	15/315(4.8%)	0.06

retroperitoneal sepsis and rectal perforations as well as pneumoretroperitoneum and pneumomediastinum.⁵ Six patients required faecal diversion, and one died. These reports tempered the initial enthusiasm for SH and in 2004 Nisar et al. emphasized “potentially devastating complications” of SH in a meta-analysis indicating CH as the gold standard.¹⁶ Since then, an equal number of life-threatening complications after SH have also been reported, the majority requiring faecal diversion with occasional deaths. The number of these adverse events is comparable to those observed after CH over a 40 year period (1964–2003), although severe complications following CH hardly require faecal diversion.¹⁷ Pescatori et al. observed that the risk of these severe complications is higher after SH because it involves the distal rectum with a ‘blind’ resection and suture, close to the vagina, the prostate and the Douglas pouch, which is also a possible site of an enterosigmoidocele.¹⁷ Although Ravo et al. estimated a life-threatening complications rate of 1:1200 after SH in a large retrospective study, we believe that the real number of life-threatening complications is largely overlooked because of unpublished events. It has been pointed that most of these cases have been performed by general surgeons¹⁷ despite the fact that a consensus paper had recommended that the operation should be carried out only by specialists trained

**Figure 4** Estimated risk of reinterventions after SH and CH.**Table 6** (Referred Patients): Summary of Complications and Management

Complications	Number (<i>n</i>)	Management	Notes/outcome
Rectal perforation	1	Hartmann reversed	4/12 Later
Tenesmus-urgency	10	Biofeedback	
Disabling chronic pain	4	Analgesic/ Ca ²⁺ CB	Uneffective 2/4
		EUA (stapler removal)	Effective 2/2
Recurrence	6	Conservative uneffective RB Surgery-CH	6/6 Effective 1/2 4 (3 closed/1 open)
Stenosis	1	Anoplasty	Asymmetric low stapled line
Fissure	1	Medical (GTN) Surgery (LIS)	Uneffective Effective

in this technique.¹⁸ In case of unexpected severe perineal or abdominal pain, urinary retention or difficulties with micturition, fever and leucocytosis, even if local examination is negative, an abdominal CT scan should be immediately performed. Predominant findings at CT scan are pneumoretroperitoneum, pneumomediastinum and subcutaneous emphysema.^{19,20} Despite the fact that successful conservative management has been reported, we believe that anastomotic repair with faecal diversion or a Hartman’s procedure should always be performed before worsening of clinical conditions. At exploration (by laparotomy or laparoscopy), very little will be found with oedema of the rectum and pararectal tissues associated to minimal or absent retroperitoneal fluid or pus depending from the onset and duration of symptoms prior surgery. Emphysema along the mesorectum and retroperitoneum can be observed.

Recto-vaginal fistula can also occur, and to date, three cases have been described.^{11,21,22} This complication can be avoided by assessing the thickness of the rectovaginal septum before inserting the purse-string suture. Care should be taken not to place too deep a suture anteriorly during the purse-string, and vagina should be examined before firing. If rectovaginal fistula occurs, immediate repair should be attempted after excision of the staples ring, and a faecal diversion should be made.

Three cases of acute rectal obstruction after SH have been reported worldwide secondary to complete closure of the distal rectum by the retained purse string entrapped by the staples (two cases) or secondary to haematoma within the layers of the bowel wall (one case).^{23–25} It may require laparotomy and faecal diversion due to subsequent spontaneous or iatrogenic perforation. If immediately recognised a *Delorme* approach could be attempted.²³

Although we did not observe any, the rectal pocket syndrome may follow SH due to the entrapment of faecoliths leading to transient intramural sepsis.²⁶ This syndrome may be due to incorrect placement of purse-string suture and requires laying open the pocket.²⁶

Several authors suggested possible lesions of the anal sphincter apparatus mainly secondary to anal dilatation or muscle entrapment at stapler firing. Randomised data have shown that the continence score as well as anorectal manometric and endoanal US findings are similar to those found after CH.¹³

Severe persistent pain after SH has been reported between 2% and 16% and represents the most common cause of reintervention (up to 45% of cases).^{10,17,27} In absence of thrombosis or fissure, the pain is described as intense and dull, refractory to treatment and associated variably with tenesmus or urgency (proctalgia). However, pain can be sharp and rapidly increasing after defecation (10–30 min) without evidence of an anal fissure (post-defecation syndrome). Its aetiology is uncertain, and there is clinical evidence of anal sphincter spasm and high anal sphincter pressures on manometry.²⁸ Calcium channel blockers therapy is effective with restoration of quality of life.²⁸ In this report, a total of seven patients experienced persistent pain and all initially treated with topical and oral Calcium channel blockers. This treatment was effective in four who presented a clear post-defecation syndrome. Three patients required anal exploration under anaesthesia and, along with other authors, the surgical removal of the retained staples or stitches allowed complete resolution of the pain and associated symptoms.¹⁷ We have previously shown a significant association between longer-term pain and the presence of transitional epithelium in the specimen.²⁹ Moreover, some authors have indicated that inclusion of smooth muscle in the excised doughnut may be related to the subsequent development of pain, despite clear data are not available.⁹ Mlakar et al. suggested that severe longer-term pain may be related to haemostatic stitches at the staple line close to the dentate line.⁹ It can be speculated that the metallic staples may act as ongoing inflammatory stimulus responsible for longer term pain.³⁰ Accurate placement of the staple line is mandatory in order to avoid internal anal sphincter and anodermal tissue involvement.¹⁴

Tenesmus, frequency and faecal urgency are variably associated and reported between 5% and 40% and are usually transient and self-limiting.^{8–11} These symptoms were observed in about 14.5% of our patients, but both tenesmus and urgency were the most frequent complications in the referred group.

According to other authors, we believe that they may arise because of tissue oedema and thrombosis as well as disruption of the anatomy and function of the normal anal cushions as follow-up examination usually do not demon-

strate any abnormality such as low placement of the staple line or damage to the dentate line and are usually transitory. However, the reduced rectal capacity may explain frequency and urgency increase as well as tenesmus as observed by Pescatori and Chetham.^{12,17}

We observed a high rate of residual and recurrent haemorrhoids (6.3%). Shalaby and Desoky reported a 1% recurrent prolapse, but this study included also patients with second degree haemorrhoids.^{2,8,13,19} Conversely, Ganio et al. reported a 20% recurrent prolapse after a telephone follow-up on 50 patients who underwent SH.² All our recurrences occurred in patients with fourth degree haemorrhoids. Similarly, Ortiz et al. reported more frequent recurrence in fourth degree haemorrhoids compared to third degree.³¹ In our experience, recurrence rate after CH is less than 2% (five out 315 patients) for similar follow up of SH without differences between third degree (three patients out of 196) and fourth degree (two patients out of 119) haemorrhoids. These findings persuaded us to believe that fourth degree haemorrhoids may not represent an appropriate indication for SH, as the success of the operation depends entirely on the resection and reduction of the prolapse by the staple.

In conclusion, the risk of severe life-threatening complications and frequent recurrences explain the reduced use of this technique to treat haemorrhoidal disease. Longer-term and larger studies are needed to further clarify its indications. Meanwhile, abuses should be minimised to reduce unusual and challenging complications.

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Discussion

Reinterventions for Specific Technique-Related Complications of Stapled Hemorrhoidopexy (SH): A Critical Appraisal

Susan Gearhart, M.D. (Baltimore, MD, USA): I

want to thank you for providing me with the manuscript, and I enjoyed your talk. To summarize a little bit, because I think you are dealing with a couple of different groups of patients, what I have put together is that you have studied patients undergoing stapled haemorrhoidectomy for third and fourth degree haemorrhoids, and you are looking at their complications and how they were managed. There was a 16% complication rate in your own surgical haemorrhoidectomy group, and of that, about 5% of them needed reintervention. I do not quite have a handle on how successful overall you were with your reinterventions and that information could be beneficial for the manuscript. I have a few questions to ask you.

The first is related to pain. You have gone into it in more detail in your talk, and that has been very helpful. You mentioned initially in your paper that in the first 7 days, there is a slight difference but not significantly; but later on, there is more evidence of a difference in pain. That has always been true in all the papers that analysed stapled haemorrhoidectomies, and I wanted to see if you have any additional information to add to that issue.

The other issue you brought up was about the staples being retained, and I think that is an interesting phenomenon that we have not really seen elsewhere. We have not seen it in patients who have colo-anal anastomoses experiencing pain. It is a different technique, but maybe some more information regarding the height of the staple

line would be informative and maybe looking at the pathological specimens in those patients and seeing if there is more muscle involved would be beneficial.

The final question I have is, you touched a little bit about this in your talk, but in your paper, you make the statement that performing a stapled haemorrhoidectomy on fourth degree haemorrhoids would probably not be beneficial and should be avoided. Then, you discussed briefly in your talk the differences between complication rates for third and fourth degree haemorrhoids with respect to bleeding and recurrence. Do you have any information about the differences between third and fourth degree haemorrhoids with respect to pain, reoperative interventions and other parameters?

Pierpaolo Sileri, M.D. (Rome, Italy): The use of VAS score to assess postoperative pain after haemorrhoidectomy is well validated by the literature. According to the majority of the papers, the pain is less since the first postoperative day and so forth up to 14 days. In our experience, the pain is significantly reduced from postoperative days 4 to 7. We believe that some of the reported differences between papers can be the consequence of additional procedures during haemorrhoidopexy such as the removal of anal tags or the use of diathermy on external haemorrhoids or prolapsed haemorrhoids.

Dr. Gearhart: The pain issue was about long-term outcomes. That has not really always been seen in the literature. Is there any other idea? You included just your group and not the other group. Is there any reason why there should be a difference between long-term pain results?

Dr. Sileri: When a patient still suffers with severe pain after 1 year from surgery, still using painkillers, with a normal proctoscopy, a normal ultrasound, usually we offer an anal exploration under anesthesia, and at surgery the only thing we can find is the muco-mucosal anastomosis with some metallic staples within the wall and the scar and so often, we remove the staples. In our and others' experience, this results in pain relief, probably secondary to the removal of the irritant stimulus. Regarding the difference in pain after rectal resection versus stapled haemorrhoidopexy, this is probably due to the complete disconnection of all neuronal pathways present in the wall after rectal resection. On the other hand, when you perform the SH, since it should not be a full thickness resection, the myenteric plexus remains in situ, and this may be responsible for the pain if the staples remain there.

For the third question regarding third versus fourth degree, I do not think I can answer that because of the paucity of complications among our series. According to our experience, despite the insignificance, we observed an increased risk of recurrence and bleeding after haemorrhoidopexy for fourth degree haemorrhoids. This may be the consequence of a more difficult surgery secondary to voluminous piles that occupy the entire anal canal. Moreover, the bleeding risk might be increased due to the trauma on these voluminous piles during the introduction and removal of the dilator. So, in order to better understand if fourth degree haemorrhoids are a good indication for haemorrhoidopexy, more longer-term and larger studies are needed.