Stapled vs Excision Hemorrhoidectomy

Long-term Results of a Prospective Randomized Trial

Franc H. Hetzer, MD; Nicolas Demartines, MD; Alexander E. Handschin, MD; Pierre-Alain Clavien, MD, PhD

Hypothesis: Stapled hemorrhoidectomy offers several advantages over excision hemorrhoidectomy, including reduced postoperative pain, a reduced hospital stay, and an earlier recovery time. Furthermore, stapled hemorrhoidectomy is associated with lower hemorrhoidal recurrence on long-term follow-up.

Design: A randomized prospective trial. Patients were blinded to the operation technique used. Follow-up occurred at 1 and 3 weeks and 12 months postoperatively.

Setting: A university hospital providing primary, secondary, and tertiary care.

Patients: Forty patients with second- and third-degree hemorrhoid disease were randomized to undergo either stapled or excision hemorrhoidectomy. Two patients were excluded. All patients were subject to a follow-up examination.

Interventions: Stapled hemorrhoidectomy (Longo technique) vs excision hemorrhoidectomy (Ferguson technique).

Main Outcome Measures: Operating time, postoperative pain (measured by the visual analog scale), hospital stay, histologic features, morbidity, defecation habit, continence, recovery time (return to work), and hemorrhoid recurrence at 1 year.

Results: Stapled vs excision hemorrhoidectomy was associated with a significantly reduced operating time (30 vs 43.25 minutes; \( P < .001 \)), reduced postoperative pain scores (visual analog score) on the first 4 postoperative days (day 1: 2.7 vs 6.3; day 2: 1.7 vs 6.3; day 3: 0.8 vs 5.4; and day 4: 0.5 vs 4.8, where 0 indicates no pain, and 10, maximum pain; \( P = .001 \)), and an earlier return to work (6.7 vs 20.7 days; \( P = .001 \)). There were no differences for stapled vs excision hemorrhoidectomy in length of hospital stay (2.4 vs 2.1 days), complications (3 [15%] of 20 patients vs 5 [25%] of 20 patients), and recurrence rate (1 [5%] of 20 patients vs 1 [5%] of 20 patients).

Conclusions: Stapled hemorrhoidectomy is associated with reduced postoperative pain, earlier recovery time and return to work, and a similar recurrence rate compared with the excision technique. Provided further clinical trials confirm these findings, stapled hemorrhoidectomy may become a future gold standard.

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EXCISION hemorrhoidectomy is associated with significant postoperative pain because of trauma of the sensitive anal mucosa (anoderm). Furthermore, the patients have to maintain a precise wound dressing to prevent local infection, because local wound exposure may lead to fecal contamination and prolonged wound healing. In a small series including 23 patients, it was shown that the stapled hemorrhoidectomy initially described by Longo leads to less postoperative pain, a shorter postoperative hospital stay, and a shorter recovery time in patients with third-degree hemorrhoids compared with conventional hemorrhoidectomy. Faster wound healing and less postoperative pain have also been observed. Larger studies comparing the 2 techniques confirmed less postoperative pain and an earlier return to work in the stapler group but showed no difference in total hospital stay and overall complications. However, severe complications following stapled hemorrhoidectomy have been reported in 0.12% of the cases; these complications include sphincter lesions, persistent postoperative pain, rectal perforations, and even lethal sepsis.

These controversial results suggest the need for further prospective evalua-
PATIENTS AND METHODS

Between January 1, 1999, and July 31, 2000, 42 patients with symptomatic second- or third-degree hemorrhoid disease, according to the grading of Milles, were included in this prospective randomized study. Two patients refused to participate. The study was approved by the local ethics committee. Following written informed consent, the patients were allocated by drawing lots—generated randomization to undergo either stapled hemorrhoidectomy (the Longo technique) (n=20) or excision hemorrhoidectomy (the Ferguson technique) (n=20). During the hospital stay, the patients were not informed of the technique performed, but this information was given during a 3-week follow-up examination on request. Because the patients were blinded to the technique used, the same care and dressing of the anal region was performed in both groups in the postoperative period.

The operation was performed under either general anesthesia (in 22 [53%] of the 40 patients) or spinal anesthesia (in 18 [45%] of the 40 patients), depending on the patient’s preference and the anesthesiologist’s advice, and by the same surgeon (F.H.H.), who was experienced in colorectal and proctologic surgery, with a previous learning curve in stapled hemorrhoidectomy (>30 procedures). Patients were placed in a position for lithotomy. A cleaning enema was given preoperatively. Before extubation, the patients received basic analgesia intravenously (2 g of acetaminophen); patients who were operated on using spinal anesthesia received 0.5% bupivacaine hydrochloride locally. No antibiotics were given in this trial. The hemorrhoidectomy in the conventional group was performed according to the Ferguson technique. The base of the hemorrhoid was excised and the wound was sutured with a 3.0 polyglactin 910 thread (Vicryl rapid; Ethicon, Inc, Norderstedt, Denmark) was applied. The operating time was defined as the time from the beginning of the operation until the application of the endoanal dressing.

All patients received a normal diet postoperatively and were given lactulose for preventing hard stool. Patients in both groups were requested to perform the same cleaning of the anal region 2 to 3 times per day using a shower. The same type of external anal dressing was applied, and the patients agreed not to inspect the anal region themselves to maintain blinding during the postoperative period.

A pain score data sheet (visual analog scale) was filled out by the patients postoperatively (0 indicates no pain; and 10, maximum pain). Pain scores were evaluated 12 hours later and on the next 3 consecutive postoperative days by a surgeon not involved in the operation. Pain therapy consisted of a basic analgesia (acetaminophen) and addition of subcutaneous injections of meperidine hydrochloride, 25 mg every 3 to 6 hours, on request. At discharge from the hospital, the patients received lactulose, 20 mL daily, and basic analgesia (acetaminophen).

All specimens were analyzed histologically after hematoxylin-eosin staining to detect skeletal or smooth muscle fibers. A continence score was evaluated using the Williams score preoperatively and after 12 weeks.

Forty patients were operated on for second-degree (n=12) or third-degree (n=28) hemorrhoids, according to the Milles classification. Ten patients with second-degree hemorrhoids were treated previously by rubber band ligation, and 2 refused the rubber band. These 12 patients were operated on and included in the study.

Patient characteristics were comparable for age, sex, and grade of hemorrhoid disease. The characteristics of the patients in the 2 groups are as follows:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Stapled Group</th>
<th>Excision Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No.</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Degree of hemorrhoids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Third</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Recurrent hemorrhoid</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Age, mean (range), y</td>
<td>50.4 (32-72)</td>
<td>44.9 (28-74)</td>
</tr>
<tr>
<td>Male-female ratio</td>
<td>15:5</td>
<td>14:6</td>
</tr>
</tbody>
</table>

The overall operating time was 30 minutes (range, 15-45 minutes) in the stapler group and 43 minutes (range, 25-60 minutes) in the excision group (P<.001).
Surgery was performed under general anesthesia in 12 of the 20 patients in the stapler group and in 10 of the 20 patients in the excision group, while spinal anesthesia was applied in 8 and 10 patients, respectively. Using the visual analog scale, mean pain scores were 2.7 (range, 0-8), 1.7 (range, 0-6), 0.8 (range, 0-3), and 0.5 (range, 0-2) on days 1, 2, 3, and 4, respectively, in the stapler group; in the excision group, the respective values were 6.3 (range, 0-10), 6.3 (range, 1-10), 5.4 (range, 1-9), and 4.8 (range, 1-10). The average amount of pain in the stapler group was significantly lower than in the excision group (P = .001) (Figure).

The mean length of the hospital stay after hemorrhoidectomy was 2.4 days (range, 1-4 days) in the stapler group and 2.1 days (range, 1-4 days) in the excision group; this difference was not statistically significant (P = .17). Patients returned to work at an average of 6.7 days (range, 2-14 days) in the stapler group and 20.7 days (range, 7-45 days) in the excision group (P = .001).

Histologic examinations of resected specimens revealed small parts of skeletal muscle fibers in 3 patients (15%), all in the excision group (P = .43). Smooth muscle fibers were found in 4 patients (20%) in the stapler group and in 5 patients (25%) in the excision group (P = .80).

Of the 40 study patients, perioperative complications observed included bleeding in 2 patients and perianal thrombosis in 1 patient in the stapler group, and urinary retention in 1 patient and suture dehiscence in 4 patients in the excision group, all occurring within the first postoperative week. The 2 bleeding complications occurred within 2 hours following surgery and required a subsequent operation. In one patient, a bleeding arterial vessel had to be sutured; in the other patient, the bleeding stopped after internal compression with a balloon catheter for 30 minutes. The total postoperative complication rate was 15% (3 of 20 patients) in the stapler group and 25% (5 of 20 patients) in the excision group (P = .60). There were no deaths in either group; and at 1 year, recurrent hemorrhoidal disease occurred in 1 (5%) of the patients in both groups.

A follow-up examination after 3 and 12 weeks (follow-up, 100%) revealed impaired wound healing because of suture dehiscence in 4 of the 40 patients, all in the excision group. No impaired wound healing was observed in the stapler group. No cases of incontinence were observed during the follow-up period. The Williams score, evaluating for incontinence, was 1.0 preoperatively and postoperatively in the stapler group and 1.1 preoperatively and postoperatively in the excision group.

After 1 year, a total of 2 patients presented with second-degree recurrent hemorrhoidal disease; one was operated on by the excision technique and one was operated on by stapled hemorrhoidectomy. Both recurrent hemorrhoids were treated successfully with a rubber band ligature.

After 1 year, there were neither signs of rectal stenosis nor perirectal fistulas in either group, and none of the patients had residual perianal pain. Because neither signs of sphincter damage nor incontinence were observed in both groups, we did not perform postoperative endosonography or a manometric examination.
parts of epithelium of the anal canal were observed. One of these patients complained about more postoperative pain (visual analog scale score: day 1, 7; day 2, 6; and day 3, 3) than the mean of patients in the stapler group. This finding is most likely a result of a resection margin close to the sensitive epithelium of the anal canal area, and may explain the bad results on pain observed in a famous study on stapled hemorrhoidectomy performed in an established colorectal center by Cheetham et al. The researchers decided to interrupt their study because patients in the stapler group had significantly more postoperative pain. This publication remained controversial, and was challenged in several letters to the editor.17-20

In our series including a 1-year follow-up, none of the patients had persistent residual pain. This suggests that great attention has to be given to the level of the stapler line 3 to 5 cm above the dentate line, as initially recommended by Longo21 and confirmed by others.2,22 Thereafter, the complete resection line is located above the anodermal line, out of the sensitive nerves, thus explaining the absence of pain.

The pathophysiologic background of the treatment of hemorrhoidal disease by stapler is different than the pathophysiologic basis for excision hemorrhoidectomy, and is being controversially discussed. The complete circular mucosa cranial to the hemorrhoidal plexus is resected, allowing reduction of mucosa prolapse by mucosa lifting and by fixing the prolapsed mucosa at the rectum wall. The reduction of arterial blood flow to the hemorrhoidal plexus is probably not the main point of the treatment. A Doppler investigation with preoperative and postoperative measurement of the arterial inflow to the hemorrhoidal cushion did not show any significant differences.22 The repositioning of the prolapsed mucosa and thereby the improvement of the venous reflux may be the key of the treatment, but further investigations are necessary to clarify this point.

The indication for stapled hemorrhoidectomy in our study included third-degree hemorrhoids and second-degree hemorrhoids after an unsuccessful nonoperative treatment (eg, a rubber band ligature). Fourth-degree hemorrhoids are usually not regarded as a contraindication for stapled hemorrhoidectomy,3 but were not included in the present study.

The incidence of hemorrhoid recurrence did not differ in the 2 groups within the 1-year follow-up, but a longer follow-up should be observed.

We did not evaluate the postoperative analgesic medication taken, which may limit the interpretation of this observation; however, even though both patient groups had free access to minor analgesics, the stapler group had significantly less pain than the excision group (average visual analog scale score: 1.4 vs 5.7, P < .001). In a randomized trial, Mehigan et al2 reported a 50% reduction in postoperative pain medication consumption in patients who underwent stapled hemorrhoidectomy compared with patients who underwent excision (Milligan-Morgan) hemorrhoidectomy. The rather small number of patients who were included in the study limits the interpretation of the results. However, the results of our prospective, randomized, patient-blinded study are in accordance with the results of the 4 other studies2-6 comparing stapled hemorrhoidectomy with excision hemorrhoidectomy.

We conclude that with an adequate handle of the stapler procedure, including sufficient sphincter dilatation before stapler placement, a resection line at least 3 cm above the dentate line, and a cautious hemostasis during surgery, stapled hemorrhoidectomy is a safe and reliable procedure in the treatment of second- and third-degree hemorrhoids. It offers a similar clinical outcome as excision hemorrhoidectomy while offering a significantly shorter operating time, significantly reduced postoperative pain, an earlier return to work, and low recurrence at 1 year. Provided further clinical trials confirm the findings of our study, stapled hemorrhoidectomy may become a new standard in the treatment of hemorrhoid disease.

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Corresponding author and reprints: Nicolas Demartines, MD, Department for Visceral and Transplantation Surgery, University Hospital of Zurich, Ramistrasse 100, 8091 Zurich, Switzerland (e-mail: nicolas.demartines@chi.usz.ch).

REFERENCES