Complications of stapled hemorrhoidectomy: a French multicentric study

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SUMMARY

Objectives — The aim of this retrospective multicentric study was to assess the complications of the Longo technique for the treatment of haemorrhoidal disease.

Methods — From March 1999 to April 2003, 550 patients underwent a stapled hemorrhoidectomy following Longo’s technique in 12 surgical units in the Rhône-Alpes Region. The operative indications were the same as for conventional hemorrhoidectomy. Complications were divided into early or late complications depending on whether they occurred before or after the 7th day. For each patient, the most serious complication was retained for analysis.

Results — One hundred and five patients (19%), mean age 51 years, experienced complications. The early complications were bleeding (1.8%), severe anal pain (2.3%), urinary retention (0.9%) and sepsis (0.5%). Late complications were chronic anal pain (1.6%), suture dehiscence (1.6%), anal stricture (1.6%), anal fissure (0.9%), external thrombosis (0.9%), fistulae and intramural abscesses (0.9%), anal incontinence (0.3%), haemorrhoidal disease symptoms persistence or recurrence (3.2%). Strictures were successfully dilated, fissures were treated by sphincterotomy, external thromboses were excised and fistulae were laid open. Most of the recurrences were treated with the Milligan-Morgan hemorrhoidectomy technique.

Conclusion — Complications may occur after stapled hemorrhoidectomy, some are particularly serious, especially bleeding and sepsis.

RÉSUMÉ

Les complications de la technique de Longo : étude multicentrique française

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Objectifs — L’objectif de cette étude rétrospective multicentrique était d’analyser les complications de la technique de Longo dans le traitement de la maladie hémorroïdaire.


Résultats — Cent-cinq malades (19 %) d’une moyenne d’âge de 51 ans ont présenté au moins une complication. Les complications précoces étaient des hémorragies (1,8 %), des douleurs anales majeures (2,3 %), des troubles urinaires (0,9 %) et des abcès (0,5 %). Les complications tardives étaient des douleurs chroniques (1,6 %), des déhiscences de suture (1,6 %), des sténoses anales (1,6 %), des fissures anales (0,9 %), des thromboses hémorroïdaires externes (0,9 %), des fistules et des abcès intra-muraux (0,9 %), une incontinence anale (0,3 %) et la persistance ou la reprise d’une maladie hémorroïdaire (3,2 %). Les sténoses ont été dilatées avec succès, les fissures ont été traitées par sphinctérotomie avec ou sans anoplastie, toutes les thromboses hémorroïdaires ont été excisées, les abcès et les fistules ont été mis à plat avec un lambeau d’abaissement sous couvert d’une colostomie dans un cas. La plupart des « récidives » ont été traitées selon la technique de Milligan et Morgan.

Conclusion — Des complications peuvent survenir après anopexie circulaire. Certaines d’entre elles peuvent être graves, en particulier les complications hémorragiques et infectieuses.

Introduction

The Longo technique, described in 1993, is proposed for the treatment of hemorrhoidal disease [1]. Also called circumferential musosectomy or circular anopexy, it is based on the Lehur technique [2] applied for the treatment of anorectal varices in patients with portal hypertension. It has become rapidly popular in Europe, particularly in France [3-8].

Conventional techniques, e.g. Milligan-Morgan hemorrhoidectomy, are considered to be particularly painful. With the Longo technique, patients experience less pain postoperatively and at defecation, making it an attractive alternative. Consumption of analgesics is reduced and hospitalization is shorter with more rapid return to occupational activities [3-5, 9, 10]. This procedure does however involve some risk and serious complications have been reported in the literature [11-15].

The purpose of this retrospective multicentric study was to analyze the complications of the Longo operation for the treatment of hemorrhoidal disease and to identify complications specifically related to the operative technique.
Patients and methods

Operative technique

The Longo procedure consists of the resection of the prolapsed mucosa and ligature of the internal hemorrhoidal pedicles. The entire procedure is performed within the non-sensory zone of the rectum above the dentate line. The anatomy of the anal canal is preserved and there is no injury to the skin or the sphincter system. The operation can be performed under general or locoregional anesthesia or with a perineal block.

A single-use circular clamp measuring more than 31 mm in a diameter is used with vascular staples closing at 1-mm thickness to ensure good hemostasis. The instrumentation set includes a circular anal dilator, a suture anuscope, a circular stapler and a suture threader. The patient is installed in the dorsal lithotomy position. After exposure of the hemorrhoidal tissue by traction on the clamp, the anal canal is slowly dilated. The spreader is applied to expose the upper part of the anal canal and the lower rectum. The dentate line is identified. A single-thread purse suture is prepared in the rectal mucosa 3 cm 4 cm above the dentate line, quadrant by quadrant and distant from the internal sphincter. Care must be taken to make the purse suture entirely within the mucosa. With a deeper suture, muscle fibers would be cut. Epinephrine may be injected into the submucosa for safety [16]. By pivoting the anuscope and the suture kit, the purse suture can be easily prepared at the same level in each quadrant without approaching the dentate line. The stapler is then introduced fully opened into the anal canal and pushed into contact with the sacrum. The purse suture is drawn into the stapler casing and the knot is tied fully opened into the anal canal and pushed into contact with the sacrum. The purse suture is drawn into the stapler casing and the knot is tied into the casing and the knot is tied.

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Patients and methods

A questionnaire was mailed to 50 surgeons in the Rhône Alpes who practice stapled hemorroidectomy using the Longo technique in order to determine the frequency of early and late complications and to identify complications specifically related to the procedure. Complications were considered early if they occurred during the first week and late if they occurred after the seventh postoperative day. The surgeons were asked to describe treatment of the complications and outcome after treatment.

Twelve centers responded to the questionnaire. From March 1, 1999 to April 30, 2003, 550 consecutive patients, with a mean age of 51 years [21-27] underwent stapled hemorroidectomy. During this same period conventional pedicular hemorroidectomy was performed in 659 patients. The indication for stapled hemorroidectomy was the same as for conventional pedicular hemorroidectomy (generally grade III hemorrhoids). Patients had symptoms for several years. All patients were reviewed at three to six weeks post-operatively. None of the patients were lost to follow-up. Certain operators performed anoscopy systematically while others only in patients with complications or if digital examination left a doubt about the complete circular suture. Patients with complications were followed on average for 11 months (range: 2-40).

Results

One hundred and five patients (19%) presented one or more complications. The most serious complication for each patient was retained for analysis.

Early complications

Thirty-seven early (6.7 %) complications are listed in table I.

Defective stapling was noted intraoperatively in two patients and attributed to a technical error or due to problems with material. Manual "salvage" suture was performed in both patients.

During the operation, one patient developed a rapidly expansile voluminous hematoma which resolved readily after transanal drainage and hemostasis at the end of the operation. In a fourth patient, a complementary second procedure was required due to insufficient reduction of grade 4 mucosal prolapse after stapling.

Eight patients presented abundant bleeding a few hours after the operation. Seven were treated in the operative theater. For two patients, the hemorhage arose from arteriolar bleeding from the staple line; hemostasis was achieved with suture. For five patients, the source of the bleeding could not be identified but was successfully managed with simple declotting. The eighth patient presented a submucosal hematoma which was initially rectal then massive, reaching the pelvis and even the cecum. Drainage was successful via rectotomy performed with antibiotic prophylaxis and the patient was discharged a few days later.

Sudden bleeding occurred in another patient on the third post-operative day. The probable cause was ulceration after scar tissue sloughing. Revision was required for hemostatic suture.

Four patients presented with acute urinary retention which resolved after temporary catheterization. Dysuria was observed in one patient and persisted for one week.

Three patients developed an early intramural abscess. After laying open the abscess, the situation resolved in two patients but a severe rectal syndrome persisted for one month in the third.

Thirteen patients presented significant anal pain during the early postoperative period and required major analgesia.

One patient experienced intermittent anal incontinence which resolved quickly. Two patients complained of constipation which persisted for more than 7 days; a fecaloma developed and the patients were hospitalized again for treatment with laxatives and enemas.

Late complications (table II)

Late complications were more frequent (N = 68 (12.4 %)) (table II).

Seven patients presented with severe anal pain which required major analgesia; the pain persisted for ten days in one patient, fifteen days in five and six months in one patient.

Five patients presented with anal fissuration, treated by sphincterotony with or without anoplasty in four and medically in one.

Abundant bleeding developed three weeks after surgery in one patient who required revision surgery under general anesthesia for hemostasis and blood transfusion. Five patients developed single or multiple external hemorrhoidal thrombosis treated by incision under local anesthesia in all.

Suture dehiscence was discovered in nine patients at systematic examination at one month. Surgical treatment was proposed.

Table 1 – Early complications after stapled hemorroidectomy.

<table>
<thead>
<tr>
<th>Type of complication</th>
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<tbody>
<tr>
<td>Hemorrhage</td>
</tr>
<tr>
<td>Severe anal pain</td>
</tr>
<tr>
<td>Urinary disorders</td>
</tr>
<tr>
<td>Suppurations</td>
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</tbody>
</table>

Complications précoces après hémorroidopexie selon Longo.
in only one of these patients because of persistent though moderate bleeding (inverted hemostatic suture). Two patients developed painful granulation tissue, perhaps over suture dehiscence, which resolved favorably without treatment.

Anal fistulization was observed in three patients. The primary orifice was situated on the staple line in one patient. Cleaning and elastic drainage was successful in two patients and for the third patient the abscess was still active at the last follow-up visit two years after surgery. Two patients presented with an intramural rectal abscess: one was treated at three weeks by rectotomy and the other, whose abscess developed one month after surgery, by several incision-drainage procedures followed by a lowered flap protected by colostomy.

Anal stricture developed in nine patients and was treated by anal dilatation. Three patients experienced defecation disorders (urgency) which resolved at three months. Two patients had anal incontinence, one by hypotonia of the internal sphincter and one by full thickness lateral tear of the internal sphincter demonstrated by endoanal ultrasound. Two patients complained of dyspareunia for more than one month.

Symptoms of the hemorrhoidal disease persisted in 18 patients: 13 patients still had external hemorrhoidal disease treated by excision in two and by topical treatment in 11; five patients complained of recurrent hemorrhoidal symptoms which were treated surgically in five (Milligan-Morgan) and medically in one. The first patient included in the series underwent surgery in 1999, so the follow-up is rather short for the overall series.

During the study period, the different operators did not report any serious complications after conventional hemorrhoidectomy (secondary interview).

**Discussion**

Most of the complications reported after circular stapled hemorrhoidectomy are similar to those reported after Milligan-Morgan pedicular hemorrhoidectomy. Complications specifically related to the Longo technique are external hemorrhoidal thrombosis, suture dehiscence, rectal perforation, submucosal hematoma, disabling persistent pain associated with a rectal syndrome, and sepsis. Very serious complications have been published in the literature. Certain authors attribute these complications to the learning curve for this surgery [12, 17]. This cannot be considered in the present series since the serious complications were observed after procedures performed by surgeons experienced with the technique.

Hemorrhage is by far the earliest and most worrisome complication. For some authors, it is a problem especially during the early part of the learning curve [7]. In our series, hemorrhage was reported in 2% of patients. Incidence in the literature has been very variable from 0.6% to 10% [7, 9, 18]. Both submucosal hematoma and anal bleeding are encountered. Many of our patients bled during the operation or early in the postoperative period. Bleeding can also begin later and persist for several days [19].

The most frequent cause of hemorrhage is arteriolar along the staple line. This can result from defective technique injuring the mucosa as observed in one of our patients, or by inflammatory rejection of the staples when anopexy is performed during a period of anusitis. Topical treatment is usually required. Several methods have been proposed to achieve hemostasis: Foley catheter compression, surgical suture, meshing, injection of epinephrine. Blood transfusion is required for some patients [4, 10, 14, 18, 20].

Anal pain was the most frequent early complication in our series (3.6%). In the literature, estimates range from 4% to 17.5%. The pain can persist for several days or weeks or exceptionally months and often requires major analgesia [12, 17]. The Longo technique is nevertheless advocated as being a less painful method [3, 4, 21, 22]. Pain is very variable from one patient to another and is difficult to quantify. The intensity of pain also varies with the cultural context. On the first operative day after stapled hemorrhoidectomy, pain was scored 3 on a visual analog scale by 37 Italian patients [23] and 5 by 30 Finnish patients [24]. The duration of the painful period is also variable, ranging in our series from two days to six months. In a cohort of 16 patients, Cheetham [12] reported that 31% had postoperative pain with defecation urgency lasting up to fifteen months. For certain authors [9, 12, 16, 20, 25], the cause of pain can be explained by a low staple line too close to the sphincter. Pain can be avoided by placing the purse suture very high above the dentate line but with the risk of early relapse. A safety margin of 3 to 4 cm above the dentate line, recommended by Longo, is advocated by most authors [4, 9, 19, 26]. For Cheetham, inclusion of muscle fibers in the mucosectomy could be a cause of persistent pain and defecation urgency [12]. Histological results were not available for all of our patients, but certain specimens did show muscle fibers. Pain could also be due to a narrow anal canal, anal spasticity [12], excessive sphincter tone [25], staple dehiscence, mucosal injury, or external hemorrhoidal thrombosis. All of the suture dehiscence in our series were painful.

Urine retention is not uncommon. Frequency has been reported from 0.3% by Ravo [20] to 22% for Ortiz [27]. The incidence was 0.8% in our series. There does not appear to be any clear explanation. We believe that the anesthesia could be involved. We did not examine the influence of anesthesia in our study so we cannot confirm the favorable influence of regional anesthesia put forward by certain authors. Among our surgeons, two used bladder catheters systematically in patients with spinal blocks. This is a complication common to all proctology techniques. It might be good to take the context (prostate adenoma) into consideration.

Infectious complications may occur early or late after surgery and are potentially life-threatening [11, 13, 17, 28]. We had eight septic events in our series: three occurred early and five late, giving an incidence of 1.5%. We observed superficial abscess formations, which regressed rapidly after incision, and deep intramural abscesses with fistulization. These infectious complications are probably related to perirectal bacterial seeding as pointed out by Molloy who reported a case of subperitoneal pelvic cellulitis after endoanal stapling in a 24-year-old patient.

**Table II.** Late complications (7th day and after) of stapled hemorrhoidectomy.

<table>
<thead>
<tr>
<th>Type of complication</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Chronic pain</td>
<td>1.6%</td>
</tr>
<tr>
<td>Suture dehiscence</td>
<td>1.6%</td>
</tr>
<tr>
<td>Anal stricture</td>
<td>1.6%</td>
</tr>
<tr>
<td>Anal fissure</td>
<td>0.9%</td>
</tr>
<tr>
<td>External hemorrhoidal thrombosis</td>
<td>0.9%</td>
</tr>
<tr>
<td>Intramural fistulization and abscess</td>
<td>0.9%</td>
</tr>
<tr>
<td>Anal incontinence</td>
<td>0.3%</td>
</tr>
<tr>
<td>Persistent or recurrent symptoms</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

Complications de l’anopexie circulaire
man; presacral drainage and left iliac colostomy were required [13]. Maw [11] also reported a case of retroperitoneal infection with retroperitoneum which resolved favorably after antibiotic treatment and Herold [17] reported a fatal case of Fournier gangrene. Roos [28] reported a case of retroperitoneal fistulization in a 71-year-old woman who required colostomy and debridement of necrotic tissue despite an intact staple line. Electrocoagulation for hemostasis might also favor infection since necrotic perirectal tissue can lead to abscess formation [11]. Polymeric closure is the rule. Malloy found that all of the suppurations observed developed in patients who were not given antibiotics. The relative frequency of these infectious complications and their gravity suggests that antibiotic prophylaxis might well be recommended.

Mechanical resection is a partly blind procedure so there is always a risk of including the full thickness of the rectal wall in the resection. We found muscle fragments microscopically and macroscopically in some of our operative specimens. Anal perforation and even sphincter lesions have been reported [15, 17, 22]. Herold reported the results of an anonymous survey of 224 surgical units using this technique in Germany. Among 4,635 stapled hemorrhoidectomy procedures, he described three cases of rectal perforation, two treated by temporary colostomy and one by definitive colostomy.

Anal stricture is the third leading late complication with an incidence of 1.7% in our series. Rates have been reported to vary from 0.8% to 20% [7, 14, 18, 20]. Anal stricture could be favored by two factors: residual sphincter hypertonia and scar tissue reaction. Dehiscence of the staple line could also be an important risk factor. In our nine patients, anal dilatation was sufficient to achieve a normal anal canal diameter and healing, but anoplasty is sometimes necessary [20].

External hemorrhoidal thrombosis (0.9% in our series) is another complication which can occur early or late [19, 20]. It probably results from progression of nonresected hemorrhoidal sinuoids after the operation which partly removes their drainage routes.

Hypertrophic mariscae are non-esthetic uncomfortable sequelae of external hemorrhoidal disease. They can occur as a postoperative inflammatory reaction of the residual hemorrhoidal tissue. Excision is rarely necessary. Patients with mariscae before the operation should be advised that they will not be treated with the Longo technique (except by additional excision), for which, the usefulness of circular anepexy is limited.

In the present study, we did not ask our operators to describe complications observed after conventional hemorrhoidectomy. There are few prospective comparisons on morbidity figures between stapled hemorrhoidectomy and pedicular hemorrhoidectomy. Senegore [29] recently presented results of a randomized prospective study of 156 patients with hemorrhoidal disease (77 stapled hemorrhoidectomy procedures and 79 Ferguson hemorrhoidectomies with a median 2-month follow-up): the incidence of complications was not different between the groups and there was no difference in the proportion of patients with more than one complication (35% versus 40%). None of the patients undergoing stapled hemorrhoidectomy had to return to the operating theater while six patients undergoing Ferguson hemorrhoidectomy required a second procedure [29].

In their retrospective series of 1,343 cases of Milligan-Morgan pedicular hemorrhoidectomy, Sielezneff et al. [30] reported a high rate of early complications: pain (71%), urine retention (16%) and hemorrhage (7%). The very wide discordance in the complication rates reported in the literature for surgical treatment of hemorrhoidal disease (irrespective of the technique) is a clear sign of a need for an exact definition of complications and for further work with prospective randomized studies in homogeneous populations.

Regarding late complications, Konsten and Baeten published long-term results at a median 17 years follow-up after hemorrhoidectomy for grade 2 and 3 hemorrhoidal disease: 26% of patients presented recurrence and one of two underwent a second operation [31].

Our relatively low rate of complications could be related to the short follow-up, the decision to consider only the most severe complication for each patient, and the retrospective nature of our study. We were however able to identify specific complications of stapled hemorrhoidectomy. We noted in particular extensive hematomas, pain and disabling persistent rectal syndromes, rectal perforations, and potentially life-threatening infections which required a colostomy. Such complications are not described for pedicular hemorrhoidectomy.

In conclusion, complications of circular stapled hemorrhoidectomy are infrequent but serious. Some of the complications observed in this series were probably related in part to technical errors. A large proportion of these errors can be avoided if the deep layers of the rectal wall are carefully spared so that the circular resection is strictly limited to the mucosa. The overall rate of complications in this series was certainly underestimated since we only retained the most severe complication for each patient for analysis. An expert group recently published a consensus statement on the indications and contraindications for stapled hemorrhoidectomy [26]. Application of these guidelines should limit the number of complications.

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REFERENCES

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