Main Disadvantages of Stapled Hemorrhoidopexy

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Abstract

The Longo technique, described in 1993, is proposed for the treatment of hemorrhoidal disease. The stapled hemorrhoidopexy has been introduced as an alternative to conventional hemorrhoidectomy. Despite a clear perioperative advantage regarding pain and patient comfort, the stapled hemorrhoidopexy may be followed by unusual postoperative complications. Complications may occur after stapled hemorrhoidopexy, some are particularly serious, especially bleeding and sepsis. Since 2002 more than 130 articles have been published reporting complications during and after stapled hemorrhoidopexy.

Complications were classified as being either early or late if they occurred within 7 days of the operation. Those occurring after 7 days were considered to be late.

The most common complication is early bleeding. Severe postoperative pain could be caused by dehiscence of the anastomosis or due to the fact that the anastomosis is too near to the linea dentata.

A lot of long-term complications have been described. Most of them are related to either an incorrect indication for surgery or technical errors. Severe complications leading to death have been described but are rare. The persistent anal pain after stapled hemorrhoidopexy has in the most cases the objective findings of the staple line hardened and fixed to muscular layer beyond. Irreversible urge incontinence due to lesions of the sphincter muscle or a diminished rectal capacity due to resection of too much mucosa is quite common complication if the procedure is not performed properly. Rectovaginal fistulas and anastomotic diverticula are very rare but possible.

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2 Late Complications

2.1 Bleeding
Stapled hemorrhoidopexy (SH) was largely accepted as it was claimed that it would be completed in a minor time, with less postoperative complications and better postoperative outcomes in comparison of the standard surgical techniques for the treatment of hemorrhoidal disease (as Ferguson and Milligan-Morgan techniques). In comparison to traditional hemorrhoidectomy, stapled hemorrhoidopexy is characterized by a reduced postoperative pain, due to the absence of cutaneous wound and an earlier return to work (Sultan et al. 2010; Stolfi et al. 2008). In the latest years many studies regarding postoperative outcomes and complications of stapled hemorrhoidopexy have been published. All these studies in literature have a too short postoperative follow-up to demonstrate the same result as the standard techniques in term of recurrence. Less postoperative pain and early return to work must be balanced to the higher cost of the procedure and also to the cost of the possible, even if rare, life-treating complications. In literature we found a multicenter randomized clinical trial with a 7 years follow-up from Ganio et al. that in all small series of patients demonstrate the effectiveness of both techniques; its limit is the small number of patient selected, just 100 (Ganio et al. 2007). Although stapled hemorrhoidopexy is a simple operation, it may result in major complications. Both early and late complications have been described. The overall complication rates of stapled hemorrhoidopexy reported in international literature ranges from 3.3% to 81% with an incidence of early complications between 2.3% and 58.9% and late complications between 2.5% and 80%, excluding recurrence which occurred up to 58.9%. Recurrence rate is considered to be higher than after traditional hemorrhoidectomy. Several trials had reported a higher rate of recurrence in patients treated with stapled hemorrhoidopexy than in patients who underwent traditional hemorrhoidectomy; some authors retain that many cases of recurrence can be due to the not always correct indications to hemorrhoidopexy.

Complications are commonly divided into early and late depending on whether they occur before or after the seventh day. The most common early complications are bleeding, anal pain, urinary dysfunction, and suppuration. Perforation, obstruction, anastomotic dehiscence, edema of the anastomotic ring, pelvic sepsis, early fecal urgency, and early thrombosed external hemorrhoids are also described. The possible late complications are bleeding, thrombosed external hemorrhoids, anal strictures formation, fecal and flatus incontinence, fecal urgency, submucosal anastomotic cysts, and recurrence of hemorrhoids. In literature “stapled hemorrhoidopexy syndrome (SHS)” is described as a late complication that includes the presence of urgency defecation, feeling of foreign body, and anal pain of variant amplitude (Efthimiadis et al. 2011).

1 Early Complications

1.1 Bleeding

Postoperative bleeding is the most common complication after stapled hemorrhoidectomy, but its incidence is lower than after traditional hemorrhoidectomy. Bleeding occurs more frequently immediately after surgery or from the postoperative day 7 onwards. Early postoperative bleeding incidence rate ranges from 0% to 68% (Stolfi et al. 2008); surgical reintervention for hemostasis is necessary in approximately 0–4% of cases (Lee and Jung 2016). In another review by Pescatori and Gagliardi the rates of rectal bleeding after PPH range between 1% and 11% and it is more like to occur in patients with fourth grade hemorrhoids (11%) (Pescatori and Gagliardi 2008).

Early postoperative bleeding is commonly secondary to an arteriolar bleed along the stapled line
or to an injury to the mucosa caused by defective techniques, and it may be resolved with a manual oversewing of the stapled line and the use of an endoanal sponge. Some authors stated that the reason for severe postoperative bleeding is the transection of the terminal branches of the superior hemorrhoidal artery (Gerjy et al. 2011).

Chronic bleeding may be caused to postoperative proctitis or to a granulomatous foreign body reaction to retained staples. The use of a stapler with a smaller staple height closure can be recommended: after the introduction of the newer circular stapler which has a closed stapled height of 0.75–1.5 mm (PPH 03) instead of the precedent which was 1–2.25 mm (PPH 01), the incidence of early postoperative bleeding has been reduced because of an increase in compression on rectal tissue and blood vessels (Sultan et al. 2010; Ceci and Picchio 2008). In order to obtain a better hemostasis the circular stapling device would be held closed and left in place for about 2 min (Grigoropoulos and Kalles 2001).

Early postoperative bleeding could also be due to the presence of folded mucosa in the stapled line (Pinto et al. 2014). In our experience it is important to check accurately the staple line at the end of the operation, and if bleeding is present, putting nonabsorbable stitches rather than using electrocautery is recommended (Faucherin and Voirin 2010). In the study of Kanellos et al., 86.6% of patients needed an additional hemostasis during the operation (Kanellos et al. 2006).

It is important to distinguish the clinical significance of the postoperative bleeding; in this study no patients had a severe life-treating postoperative bleeding. In literature, we found few recommended interventions to treat postoperative bleeding. In literature, we found few recommended interventions to treat postoperative bleeding; it depends on its clinical significance and it includes compression with a Foley catheter (that is useful also to diagnose the bleeding), use of mesh, suturing, local injection of adrenaline, and in a small number of cases also blood transfusions (Stolfi et al. 2008). In some cases of postoperative bleeding, a reintervention may be necessary. The additional hemostasis could be done under proctoscopy, especially in cases that could be managed with injection of adrenaline; if the patient is not able to tolerate proctoscopy because of discomfort, an anesthesia is required.

Rectal intramural hematoma is a less frequent postoperative complication with an incidence of 1.5% (van Wensen et al. 2008). It can be suspected with a painful digital rectal examination showing a rectal mass. In rare cases the progression of an intramural hematoma may lead to ischemia, perforation, and hemoperitoneum (De Santis et al. 2012). The treatment of this complication is not codified; in case of stable hematoma a conservative treatment with a simple drainage is also possible. In a case described in literature, the hematoma was drained, the perforated bowel was sutured, and a loop ileostomy was performed. It is difficult to explain how the blood may flow into the rectal wall instead of the lumen; the reason could be found in the stitches placed too deep in the rectal wall that may cause a tear in an intramural rectal artery. Also ring dehiscence after SH may cause intra-abdominal bleeding with severe hemoperitoneum, which could lead to a low anterior resection (Blouhos et al. 2007). In the case of small intramural hematoma, a completely conservative treatment is allowed.

### 1.2 Pain

From its introduction in the common practice, stapled hemorrhoidopexy was considered, a procedure characterized by less postoperative pain than traditional hemorrhoidectomy, but when compared with rubber-band ligation, the procedure is associated with a higher level of pain (Stolfi et al. 2008).

The overall incidence of postoperative pain after Longo’s procedure is reported to be 1.6–31% (Pescatori and Gagliardi 2008); 1.6% of patients required a readmission in a large series of 3711 cases for acute pain (Ng et al. 2006).

Rectal wall is innervated by the sympathetic and parasympathetic nerves, thus exciting rectal mucosa should be painless.

Early pain after a hemorrhoidopexy procedure can be due to anal dilation because it can cause
internal sphincter fragmentations in some patients. Progressive dilation of the anal canal and the rotation of the anoscope outside of the anal canal instead of the rotation directly in the anal canal may reduce the incidence of early postoperative pain.

Late postoperative pain has a different etiology: many authors reported that it could be correlated with the level of the anal suture because below the dentate line the epithelium is sensitive and richly innervated by somatic nerves. The ideal placement of the suture is approximately 3–4 cm above the dentate line. Purse string placement is not always precise, particularly when hemorrhoids are large and there is a high grade of prolapse. The height of the stapled line seems to be correlated with the duration of narcotic pain management and interval to return to work (Plocek et al. 2006). There are also reported cases in whom the staple line is well above the dentate line: in this context, elevated sphincter muscle tone is thought to be a cause of chronic pain (Ganio et al. 2007). Also the incorporation of smooth muscle into the doughnut and the induction of a staple line inflammatory response may increase the incidence of late postoperative pain (Stolfi et al. 2008). The formation of fibrosis near the staple line may chronically stimulate the nerve spindles located over the puborectalis muscle, causing a pudendal neuropathy with consequent chronic proctalgia and fecal urgency (Petersen and Jongen 2001). Other possible causes of chronic postoperative pain are the presence of persistent hemorrhoidal disease, anal fissures, retained staples with the formation of granulation tissue, wound dehiscence and sepsis, functional disorders as sphincter or rectal spasm, and high anal resting pressures (Stolfi et al. 2008).

Post-defecation pain is a specific complication of stapler hemorrhoidopexy, and men with a high anal sphincter pressure seem to be at the greatest risk of developing this complication (Petersen and Jongen 2001).

Different features are reported in histologic exam on the specimen of patient with and without chronic postoperative pain. The histology results of Longo specimen of patient with pain are peripheral nerve trunk in rectal submucosa surrounded by cicatricial fibrous tissue similar to traumatic neuroma. On the other side, only peripheral nerve trunk in rectal submucosa and normal Schwann cells were described in the specimens of asymptomatic patients.

Another cause of postoperative pain after stapled hemorrhoidopexy is the possible formation of anal fissures. The occurrence of anal fissures (not present preoperatively) is reported to be more frequent in stapled hemorrhoidopexy than in hemorrhoidectomy: this may be partially due to the anal insertion of the anoscope CAD that is used in Longo’s procedure (Stolfi et al. 2008).

When we consider the treatment of postoperative stapled hemorrhoidopexy pain, we can divide the patient in two groups: patient with pain not related with defecation (chronic proctalgia) which seems to be more frequent and patients with pain related with defecation (post-evacuatory pain). The possible treatments of stapled hemorrhoidopexy chronic postoperative pain are Nifedipin treatment, infiltrations with local anesthetics, and in some cases agrapphectomy. Post-evacuatory pain is treated by conservative treatment. Chronic proctalgia in some cases may require a rectal wall resection with agrapphectomy in particular in patient with a stapled suture below the dentate line. This procedure involves the excision of the staple line and the manual refashioning of the anastomosis (Ganio et al. 2007).

1.3 Urinary Retention

The incidence of postoperative urinary retention ranges from 0% to 13%. In a case series of more than 3500 patients, the admission for acute retention of urine was 4.9%; more than half of these patients require urinary catheterization (Ng et al. 2006). For some authors, urinary retention represents the major part of the hospital morbidity. Overall in-hospital morbidity for Sultan et al. was 9.3%, mainly caused by a 7.3% of urinary retention (Sultan et al. 2010). It can be due to the proctologic surgical intervention, but in several cases it is caused by spinal anesthesia and is temporaneous (Stolfi et al. 2008). It is managed
conservatively or with the insertion of a Foley catheter. If urinary retention is associated with fever and abdominal pain, the surgeon must pose a suspect of a major complication like a perforation or an anastomotic dehiscence with pelvic sepsis (Butterworth et al. 2012).

1.4 Fecal Urgency, Incontinence

Early fecal urgency is a frequent postoperative complication of hemorrhoidopexy with a reported incidence of 3–31%. It usually disappears within the first weeks after surgery, but in a minority of cases it may persist. In high volume center the incidence of a prolonged fecal urgency is 0.66% (Sultan et al. 2010). The etiology is probably represented by the fact that muscle contraction in response to nerve and/or muscle irritation may decrease rectal compliance. Some authors reported that in some cases of persisting fecal urgency, removing the anastomosis and scar tissue may improve the symptoms (Petersen and Jongen 2001). For other authors the origin of defecation urgency could be found in the inflammation at the side of the staple line, disruption of the anatomy and function of the normal anal cushions, extreme lowering of the stapled line resulting in resection of the sensitive anal canal mucosa (Sultan et al. 2010). In some cases tenesmus and fecal urgency can be prevented by avoiding stapled hemorrhoidopexy in patient with preoperative reduced rectal compliance or increased rectal sensation and in patients with fourth-degree piles. For these reasons a preoperative assessment of anorectal physiology is very important.

Fecal soiling may be induced by a low-placed stapled line or by fragmentation of the internal sphincter. Incontinence is also described as a transitory consequence of stapled hemorrhoidopexy: it is due to excessive anal stretching secondary to circular anal dilator insertion. A risk factor is represented by previous anal surgery because of the possible presence of scar tissue. Anal dilation has been shown to cause internal sphincter fragmentation, but in many patients who complain postoperative fecal incontinence, endoanal ultrasonography shows an intact anal canal (Cheetham et al. 2000). No significant differences are reported in incidence of postoperative incontinence with respect to conventional hemorrhoidectomy (Ceci and Picchio 2008). The use of an intraoperative anal retractor should be minimized to avoid sphincter stretch in patients who have had previous anal surgery. A smaller-size device may be advisable in patients with weak sphincters (Brusciano et al. 2004).

In case of postoperative soling or incontinence due to localized trauma of the internal sphincters, some advantages can be achieved with the use of bulking agents (as injectable silicone, carbon-coated microbeads, or autologous fat); sphincter repair is rarely needed.

1.5 Proctitis

The reported incidence of postoperative proctitis is estimated to be 10.9%, but there are not many data in literature. The diagnosis of postoperative proctitis can be made clinically when the patient complaints anal pruritus and the presence of blood or mucus in stool after discharge in addition to erythema, edema, and contact vulnerability of the rectal mucosa during proctoscopy. At the histopathologic exam the rectal mucosa may present signs of subacute inflammation with epithelial regeneration and shallow cysts. The role of histopathology in the diagnosis of postoperative proctitis is not essential so some authors suggest to not performing it because of the risk of bleeding and infection after the rectal biopsy. The pathophysiology of proctitis is probably represented by the irritation of the Morgagni crypts as a consequence of the operation. This may lead to an inflammation of the rectal mucosa with the onset of symptoms which is not immediate in the postoperative period. It is generally limited to the anal canal. There are no reported risk factors for the development of proctitis. Also the presence of smooth muscle fibers in the resected specimen seems to be an independent factor. The available treatments are only conservative and consist in medical therapy as the administration of Mesalazine suppositories, NSAIDs, and calcium
dobesilate. Antibiotics are not recommended. Prognosis is generally good with a relief of symp- 
toms in 4 weeks (Ambe and Wassenberg 2015).

1.6 Perforation, Anastomotic Dehiscence, and Pelvic Sepsis

Suppuration and septic complications are rare: the frequency of life-threatening septic complications is reported to be less than 0.1% with a mortality rate of 10%. Nevertheless, severe septic complications following stapled hemorrhoidopexy seem to be more frequent than other techniques used to treat hemorrhoid disease.

A possible etiology is thought to be the penetration of bacteria on the perirectal region due to the stapling. Full thickness stapling may also allow organism to reach the perirectal space with the consequential formation of perirectal abscess. To prevent this severe complication, the purse string must be placed within the submucosal plane and true rectal prolapse must be excluded preoperatively. Other possible causes are full-thickness resection because it can lead to anastomatic dehiscence and delayed staple line dehiscence owing to a staple defect. The staple line must always be checked at the end of the operation. In rare cases, rectal wall hematoma may spread reaching the rectosigmoid junction and cause a rectal or sigmoid perforation with the developing of sepsis. Also rectal obliteration due to a wrong placement of the purse-string may be responsible for sepsis and subsequent rectal perforation with sepsis (Faucherin and Voirin 2010).

Suppuration and sepsis must be suspected when the patient presents with fever, abdominal pain, and urinary retention; also leukocytosis and an elevation of the C-reactive protein are generally present (Butterworth et al. 2012). The most specific exam to diagnose pelvic postoperative abscess is computerized tomography (CT).

Some authors suggest the use of antibiotic prophylaxis before the procedure because rectal injury causing either hematoma or retroperitoneal sepsis may occur.

There is no standard treatment for sepsis after stapled hemorrhoidopexy. Several different approaches have been described: exploratory laparotomy, drainage of the abscess, end colostomy. In some cases when the staple line is considered intact, a conservative approach with intravenous antibiotics administration may be sufficient (van Wensen et al. 2008). Also when the staple line is not intact reintervention will not always be indicated. An intramural or a small retroperitoneal perforation could be treated with conservative measures like bowel rest, total parenteral nutrition, and intravenous antibiotics. Surgical treatment is indicated in nonresponder patients and in those with intramural abscesses.

An intraperitoneal rectal perforation usually needs a surgical management. It depends on the size of the bowel injury, timing of the diagnosis, general conditions of the patient, and surgical experience. Hartmann procedure is still performed if the wound exceeds the 50% of the bowel circumferences. Smaller lesions could be treated with a primary closure with diverging colostomy; in case of patient with severe comorbidity, a loop colostomy could be the only one surgical treatment (van Wensen et al. 2008).

Intestinal perforation after stapled mucosectomy is described as a rare complication. It is due to an undiagnosed enterocele, which is considered a contraindication to this intervention by many authors.

1.7 Rectal Lumen Obliteration

Rectal lumen obliteration is considered to be a rare but severe postoperative complication. Several authors reported cases. This complication is usually due to errors of purse string suture technique. Many reasons of rectal lumen obliteration are described. The most frequent cause is probably the presence of an unrecognized internal rectal prolapse: the purse string suture may cross the prolapse with the consequent rectal lumen obliteration. Another mechanism is the skipping of the proximal suture at the stapler line when double purse string suture is applied. In order to prevent this complication, it is important to verify the existence of the lumen before introducing the stapler. After the procedure, the surgeon has to
do a careful digital exploration of the rectum to exclude the complication and repair it immediately. Generally the treatment consists in removing the stapler punches in part where the rectal prolapse is included in the stapler suture line and fixed to the rectal wall. The mucosal defect at the removed punch sites should be repaired by some stitches (Buyukasik et al. 2009).

1.8 Early Thrombosed External Hemorrhoids

Thrombosis of external hemorrhoids is another complication of stapled hemorrhoidopexy because the hemorrhoids sinusoids are not removed and they may be traumatized during the procedure. Its incidence ranges around 3.5%, and it is one of the most frequent reasons for early surgical reintervention which globally occurs with a rate of 3.8% (Cheetham et al. 2000). The other most common causes for early surgical reintervention are bleeding and staple line dehiscence.

1.9 Rectal Pocket

It is a postoperative complication due to a partial slippage of the purse string with the subsequent formation of a pocket in the lower rectum, resembling a diverticulum or an intramural fistula. This may lead to an intermittent collection of fecalith that may be responsible of inflammation, abscess formation, and local sepsis. The literature reported incidence is 2.5%. It may be necessary a surgical lay-open of the pocket, that is effective in most cases.

1.10 Rectal Ischemia

Unlike traditional hemorrhoidectomy, stapled hemorrhoidopexy does not remove hemorrhoidal tissue but interrupts the hemorrhoidal circulation and elevate rectal mucosa to reduce the prolapse. Rectal ischemia is a rare and probably underestimates postoperative complication. It may present with pain and rectal bleeding. An endoscopic evaluation may be useful to rule out this complication. Indeed rectal ischemia may cause mucosal and submucosal ulceration with exposure of vessels. The main reason for ischemia is thought to be a full thickness rectal resection caused by an excessively deep purse string suture or thrombosis and infarction in the hemorrhoidal tissue after pexy (Pinto et al. 2014).

1.11 Rectovaginal Fistula

Rectovaginal fistula (RVF) is defined as an abnormal communication between rectum and vagina. Obstetric injury, surgical trauma, radiation, inflammatory bowel disease, and malignances are the most common causes of this rare complication. It is an occasional complication after stapled hemorrhoidopexy which occurred just in one patient in a series of 449 patients with an incidence of 0.2% (Beck 2004; Angelone et al. 2006). The rectovaginal septum can be as thin as millimeters; therefore, precise position of the purse-string suture is essential to avoid this serious complication. It is a complication that occurs when the purse-string suture is placed full thickness at the anterior aspect of the rectum and into the posterior vaginal wall; in this way the vagina is incorporated into the anastomosis. This uneventful complication is the result of a technical error. The insertion a finger into the vagina while placing the purse-string suture is the best way to avoid it. The suture must be tightened and placed under tension to exam the vagina for dimpling, suggesting incorporation into the suture line. Finally, when the stapler is closed, but prior to deployment of the staples, the vagina should be examined again for dimpling at the posterior aspect. Fistula that becomes evident days after the operation may be due to local ischemia rather than to a direct trauma.

Actually, a simple classification is available that divides RVF into two grades: simple RVF with a size of <2.5 cm and situated in the lower or middle one-third of the vaginal wall and the complex RVF with a size of >2.5 cm and located in the upper one-third of the vaginal wall.
(Rothenberger and Goldberg 1983). The simple one is mostly caused by surgical trauma or infection, the second one results from inflammatory bowel disease, radiation, or a malignant complication (Lo et al. 2016). In this study, 62 cases of RFV on a total of 341 were caused by surgical procedures concerning hemorrhoidal disease and anal fistula. More than a half of this patient was treated with simple repair, the others underwent surgical reconstruction.

The postoperative dyspareunia must raise suspicion of a rectovaginal fistula and the surgeon should perform a complete pelvic examination with vaginal speculum and anoscopy. It should be noted that not all patients with this complication necessarily experience dyspareunia.

The therapeutic option depends on the grade of the RVG. In the case of a simple fistula a conservative treatment should be considered, especially in patients with contraindications or who are not fit enough for surgery of anesthesia. A successful conservative treatment includes constipating diet, abstinence from sexual activity, metronidazole pessaries, rectal gel, and vaginal douches. If this treatment does not lead to a definitive resolution of the fistula, a simple direct closure could be a good solution. In the review of Reichert et al., anatomic fistula repair alone is associated with lower success rates compared to combined procedures with the adjunctive interposition of healthy, vascularized tissue; the transposition of vascularized tissue into the perineal space between the rectal and vaginal wall obliterate the “dead” space, improves blood supply and the growing of granulation tissue, protect the sutures of anatomic fistula repair of the different layers, and prevent rectal and vaginal stenosis (Reichert et al. 2014). It could be done transvaginally either transanally.

In the case of a complex fistula a reconstructive procedure could be done transvaginally, transabdominally or transanally. One of the most common repairs for complex fistulas is the modified Martius flap repair (Reichert et al. 2014). This pedicled flap is composed of fibroadipose tissue from the interspace between the bulbocavernousus and ischiocavernousus muscle which receives its blood supply latero-ventrally from external pudendal artery branches and latero-dorsally from internal pudendal artery branches.

In the case of complex fistula, a diverting colostomy might improve the success of the repair (Reichert et al. 2014).

1.12 Rectal Dysplasia or Adenocarcinoma

Rectal dysplasia or adenocarcinoma may be due to a misdiagnosed hemorrhoid-like cancer or may arise from an internal polypoid pile lifted up after stapled mucosectomy. For these reasons, it is important to make a careful preoperative selection of the patient (an accurate recto-anoscopy is mandatory). The diagnosis of unrecognized rectal neoplasm can be made also sending the specimen for histology routinely.

2 Late Complications

2.1 Bleeding

Bleeding is also a common late complication whose rate ranges from 0.18% to 33%. This type of late complication occurs between postoperative weeks 6 and 16 (Pescatori and Gagliardi 2008). Bleeding with defecation is commonly reported; a late frank hemorrhage is less commonly reported. Late postoperative bleeding may be due to inflammation and/or rejection of the staples (Porrett et al. 2015). If bleeding occur from residual staples or granulomas: in these cases remove of staples add or granulomas associated may be a solution (Petersen and Jongen 2001). In addition, inflammatory polyps at the staple line can cause a late bleeding. The use of suture reinforcement at staple line may cause an inflammatory reaction, but it is more likely that reaction to the staples caused the formation of polyps. Treatment with topical silver nitrate did not resolve the bleeding. Excision of the polyps did result in cessation of bleeding. The presence of exposed residual staples may also cause a late bleeding. The bleeding resolved after removal of the staples. This complication is one of the most frequent causes of reintervention after PPH.
2.2 **Stapled Hemorrhoidopexy Syndrome**

This syndrome consists of a combination of symptoms including urgency for defecation, cramping, anal discomfort, and sensation of foreign body. It was described in 2009 for Khubchandani et al. as a high prevalence (Khubchandani et al. 2009; Efthimiadis et al. 2011). Retrospective study comparing incidence of this syndrome to the presence in the surgical specimen of muscle fibers, transitional mucosa, as well as length of mucosal ring removed and the degree of disease did not find any statistically significant correlation. This may lead to the assumption that SHS is due to the irritating effect of the titanium clips in the rectal mucosa (Efthimiadis et al. 2011). The physiopathology of this syndrome is still unknown and further research is needed to find out the right answer.

2.3 **Recurrence**

Recurrence is a long-term outcome that is not well documented in world literature (White et al. 2011). The median incidence reported by some authors is 8.5%. The recurrence rate after stapled hemorrhoidopexy is higher than that after manual hemorrhoidectomy (8.5% vs. 1.5% in the long term) (Pescatori and Gagliardi 2008). White et al. in a series of 169 patients found a recurrence of hemorrhoidal bleeding prolapse during the follow-up period of 11.2% (White et al. 2011). The mean time to recurrent symptoms was 11 months. Published recurrence rate in case series ranges from 0.3% to 27% (Gerjy et al. 2011).

Insufficient stapling has been suggested by some authors to be the main reason for recurrent symptoms. Inaccurate purse string suturing, particularly in patients with fourth degree hemorrhoids with a significant degree of mucosal prolapse, can result in an incomplete mucosal resection and residual symptomatic hemorrhoids (Beck 2004). The data of White et al. suggest that a half of this recurrence rate is caused by technical failures. In another series of patients the recurrent prolapse occurred in 9% of cases (Shao et al. 2008).

Reoperation rate for recurrent prolapse in this review was 7%. For White et al. the indications for repeat surgery were bleeding (83%), prolapse (52%), and pruritus with or without discharge (26%) (Gerjy et al. 2011). A second SH should be considered when symptomatic recurrence does not respond to conservative treatment. This study demonstrates that the second SH was more painful than the first with a superior analgesic use. Also the interval to the first bowel movement was prolonged, and this length was associated with intense pain after the second SH. This difference resulted also in a prolonged recovery time (Gerjy et al. 2011). About performing the second SH, Zmora et al. studied the risk of ischemia between the two staple lines and demonstrated no vascular compromise of excess fibrosis at 1 month after application of the second staple lines suggesting that a second SH is feasible (Zmora et al. 2004). In literature is also shown a more satisfactory postoperative course if the staple line is placed more than 20 mm above the dentate line (White et al. 2011). No difference was found if the staple line was at 15-19 mm compared with a lower lever, but also a too high staple line could be associated with early recurrence. If the stapled line is above 40 mm to dentate line, the risk of recurrence is higher. The right position for the second SH for Raahave et al. is 15 mm above the dentate line; this is significantly lower than the position of the first procedure which was at 22.5 mm (Raahave et al. 2008). This means that also a high staple line could be a cause of recurrence. A repeat of the SH creates a lower stapled line that may cause greater pain with a prolonged hospital stay and increased analgesic requirement but it is safe and feasible.

2.4 **Anorectal Stricture or Stenosis**

Lower rectum stenosis is an uncommon but disabling complication of stapled hemorrhoidopexy. In the majority of studies, it is defined as a stricture that cannot be passed by the finger. In literature, a rate of incidence is reported ranging between 0.8% and 5.0%, inferior than the rate described after traditional hemorrhoidectomy. The pathological mechanism that is responsible
of postoperative lower rectal stenosis is probably submucosal inflammation due to ring dehiscence. Another possible cause is that the stapled ring is placed too deep in the anal canal with the consequent scarring of the rectal epithelium. Some authors report a full thickness excision of the rectal wall as another potential case for rectal stenosis but it is not documented in other studies. The incidence of postoperative lower rectal stenosis is higher in patients who had previously undergone proctologic surgery: this may be due to the presence of scarring tissue in the high anal canal. The first therapeutic approach is conservative and consists in the use of dilation device to enlarge the stenosis. For the majority of patients this approach is successful. In the nonresponsive case surgical therapy must be considered. A large variety of surgical approaches are available as mucosal advancement flap and many types of anoplasty. Endoscopic transanal stricturoplasty is also described (Petersen et al. 2004).

In a case series of a group from Singapore, the anorectal stricture that requires a surgical intervention is 1.4%, and in the most of these cases it is a postoperative complication that usually occurs in the first 3 months after surgery, usually about 2 weeks from surgery. If a stenosis is recognized earlier, into 2 weeks from surgery, a dilation can be easily performed because the fibrous tissue forming the stenosis is soft and easily disrupted (Ng et al. 2006). The stricture that occurs later than 3 months and that requires a surgical intervention is less common. Usually a late stenosis requires surgery.

2.5 Chronic Pain

Chronic proctalgia is an uncommon complication of hemorrhoidopexy. It is defined as “continuous pain that worsens during defecation with only a partial response to oral pain killers and that compromises lifestyle, lasting more than 3 months” (Benedetto et al. 2010).

In literature there are few studies that report the prevalence of this complication, but it is estimated that chronic proctalgia ranges from 1.6% to 31% after Longo’s procedure. The specific etiology is not clear. First of all, chronic proctalgia was related to the smooth muscle incorporation in the surgical specimen, but in several studies this correlation has not been proved: the incidence of postoperative chronic pain is similar in patients with smooth muscle fiber present in the specimen and in patients without it (Cheetham et al. 2000). Other possible causes of chronic pain are sphincter or rectal spasm or high anal resting pressures, suture dehiscence with the consequent formation of scar tissue, anal fissures, retained staples, low anastomosis, rectal pocket syndrome, and chronic proctitis secondary to ischemia (Pescatori et al. 2006). Benedetto et al. supposed that persistent pain may be cause by hemostatic sutures, indeed they can incorporate the sphincter muscle and the staples determining ischemia and necrosis with the consequent formation of ulceration and infection.

Chronic postoperative proctalgia has to be differentiated from pain due to the persistence of hemorrhoidal disease. In patients with pain persisting more than 3 months after surgery, diagnostic studies as endoanal ultrasound and anorectal manometry must be performed in order to rule out the possible cause of the symptom and to decide the therapy. Initially, a conservative treatment can be purposed (oral narcotics, steroids or local anesthetic injection, transanal electrostimulation). If this kind of treatments fails a surgical reintervention may be necessary as staple removal, agrapphectomy (the excision of the stapled line and the manual refashioning of the anastomosis). Further investigations are needed to understand the mechanism of chronic postoperative proctalgia and consequently the specific treatment.

2.6 Anal Fissure

Postoperative anal fissure may be related to a stretch in the anal canal during insertion of the anal dilator during the operation. There is no important difference between stapled hemorrhoidopexy and manual hemorrhoidectomy in the incidence of postoperative anal fissure in many reviews. Patients may complain of anal
pain, but in most cases, postoperative anal fissures are asymptomatic and not associated with sphincter pain. The most cases reported in the literature have been successfully treated with trinitroglycerin ointment. In patients who do not respond to medical treatment, a surgical procedure as fissurectomy or internal sphincterectomy may be necessary (Brusciano et al. 2004).

2.7 Persistent Skin Tags/External Components

Skin tags are more frequent after stapled hemorrhoidectomy. In stapled hemorrhoidopexy, the external hemorrhoidal components are not dealt with directly, but these are observed to regress in the early postoperative period, eventually forming radial cutaneous folds.

In some series residual tags have been reported as being the main cause of postoperative symptoms, but excision is performed as a secondary operation in a small number of patients (Brusciano et al. 2004; Beattie et al. 2000). In any case, few patients require delayed skin tag excision after stapled hemorrhoidectomy.

Our recommendation is that perianal skin tags be excised at the time of stapled hemorrhoidopexy only if the specific tags are known to be symptomatic (e.g., bleeding, excoriated) or at the specific request of the patient for reasons of hygiene or cosmesis.

References


