

## Angiographic Procedure Performed for Post-operative Retroperitoneal Haemorrhage after Longo Muco-hemorrhoidectomy

Riva F<sup>1\*</sup>, De Santis R<sup>1</sup>, Danesini GM<sup>1</sup>, Montano F<sup>1</sup>, Damiani G<sup>2</sup> and Cariati M<sup>2</sup>

<sup>1</sup>Department of Veterinary Medicine, University of Milan, Milan, Italy

<sup>2</sup>Department of Dermatology, Asst Ospedali Santi Paolo e Carlo, San Carlo Borromeo Presidium, Milan, Italy

### Abstract

Among general population, prevalence of symptomatic haemorrhoids is estimated to be about 4.4% worldwide. Even though most cases resolve spontaneously, surgery plays an important role in reducing relapsing symptoms compared to medical therapy alone. Longo haemorrhoidectomy technique, which has led to fewer major complications over the years compared to Milligan-Morgan technique (complications of which include faecal incontinence, anal stenosis, prolonged postoperative pain), can also result in rare but serious haemorrhagic consequences. In this case-report, we present an unexpected haemorrhagic complication after Longo haemorrhoidectomy, and its subsequent embolization treatment with super selective catheterise of the affected vessels. In this case haemorrhage was prominent and retroperitoneal. Diagnostic and subsequent interments radiology techniques have revealed to be essential in diagnosis and treatment.

**Keywords:** Embolization; Haemorrhoids; Inferior mesenteric artery

### Introduction

Haemorrhoids are blood vessels, normally present in the lower rectum, divided in internal and external haemorrhoids. Their venous drainage is through the superior rectal vein and through the inferior rectal vein. Internal haemorrhoids are located above the dentate line and consist in three main cushions, which drain through the superior rectal vein into the portal system. External haemorrhoids are located under the dentate line, draining through the inferior rectal vein into the inferior vena cava and are innervated by cutaneous nerves that, in case of acute thrombosis can cause pain anywhere all-around anus circumference [1].

The haemorrhoidal disease consists in a pathological dilatation of these vessels. Worldwide the prevalence of symptomatic haemorrhoids is estimated to be 4.4% in the general population [2]. External haemorrhoids occur more often in the young and in the adults and the prevalence increases with age, with a peak in people aged 45-65 years [3-6]. Internal haemorrhoids are classified according to the grading system proposed in 1985 by Banov et al. in four degrees:

- **Grade I:** Haemorrhoids project into the anal canal and often bleed but do not prolapse.
- **Grade II:** Haemorrhoids may protrude beyond the anal verge during defecation or during intense efforts but are spontaneously reduced afterwards.
- **Grade III:** Haemorrhoids require manual reduction.
- **Grade IV:** Haemorrhoids chronically prolapse and cannot be reduced.

About 40% of patients with haemorrhoids are asymptomatic. Symptomatic patients usually show haematochezia, pain associated with thrombosed haemorrhoids, anal itching and/or hard stools. In most cases the haemorrhoidal disease resolves spontaneously or with medical therapy. Possible complications, without treatment, include thrombosis, infections, ulcerations, abscesses and incontinence. With medical therapy the haemorrhoids recurrence rate is 10-50% over a period of 5 years. After surgical treatment the recurrence rate is less than 5%.

Several surgical approaches exist and the circumferential

mucosectomy is one of these. It was described for the first time in 1998 by the surgeon Antonio Longo as a possible alternative to the traditional Milligan-Morgan technique considerably bloodier and requiring longer recovery time. The traditional technique according to Milligan-Morgan consists in clamping the haemorrhoidal wobble, covered by the skin, trying to save the muscular sphincter. The haemorrhoids are completely pulled out of the anal sphincter, exposing the rectal mucosa located above the haemorrhoids themselves and using a 2.0 suture the vascular peduncles are tied, and the haemorrhoids excised. Once the pathological tissue has been excised, the wound is left open and a non-occlusive dressing is applied [7].

Otherwise, Longo's technique is mainly used to treat internal haemorrhoids of III and IV degree. The procedure consists in resecting a complete circular strip of mucosa between the lower rectal ampulla and the proximal anal canal, about 2-3 cm from the dentate line, with interruption of the superior vascularization [5]. The sutures (made of titanium wires) are fixed with a special automatic circular stapler in a region poor in sensory receptors; this meaning that postoperative pain is modest, and the recovery is faster. Longo's procedure has an average duration of 45 minutes and is usually performed under spinal anaesthesia. In the procedure a PPH 01 Ethicon Endo-Surgery stapler is used [4].

Ethicon kit includes a circular anoscope, with an external diameter of 37 mm, which is inserted into the rectum together with the dilator. A circular stapler is then inserted to create a circular suture above the haemorrhoidal tissue. The pathological tissue is brought inside the stapler, which will remove it and create a second suture line. There are two main advantages of this technique [8-11]: the mechanical suture is located a few centimetres above the dentate line, in an area with lower pain sensitivity; for this reason, the painful symptoms, in the days

**\*Corresponding author:** Riva F, Department of Veterinary Medicine, University of Milan, Milan, Italy, Tel: +393407354741; E-mail: [federica.riva2@unimi.it](mailto:federica.riva2@unimi.it)

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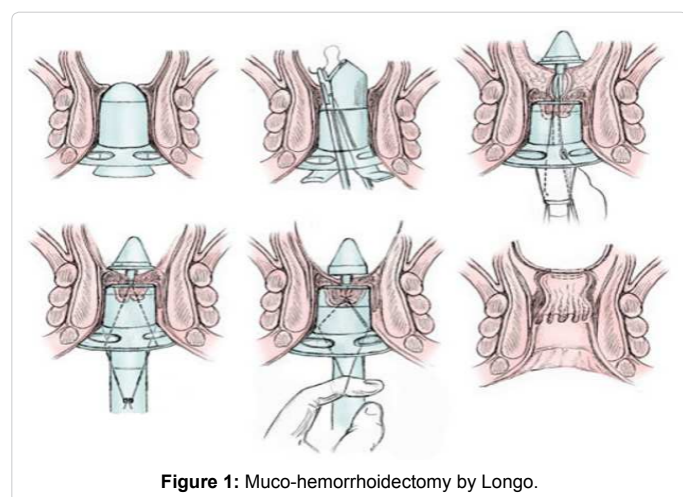
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following surgery, are considerably reduced. The second advantage concerns the faster recovery time: the average length of post-operative hospital stay is 3 days; meaning that the patient can return to work sooner (Figure 1). Complications are rare; literature report some cases:

- Bleeding (4-8%) caused by inadequate control of stapler haemostasis, requiring reoperation in 3-5% of cases.
- Early post-operative pain, even if less than if compared with traditional techniques, caused by a suture too close to the dentate line and nerve structures.
- Submucosal hematomas.
- Pelvic sepsis.
- Rectovaginal fistula.
- Traumatic perforation of the rectum.

## Case Report

A 76-year-old woman underwent elective haemorrhoidectomy for III-degree muco-hemorrhoidal prolapse associated with occasional bleeding. A colonoscopy was performed in November 2017, resulting negative. During surgery, an IV-degree muco-hemorrhoidal prolapse has been observed and haemorrhoidectomy by Longo performed. After



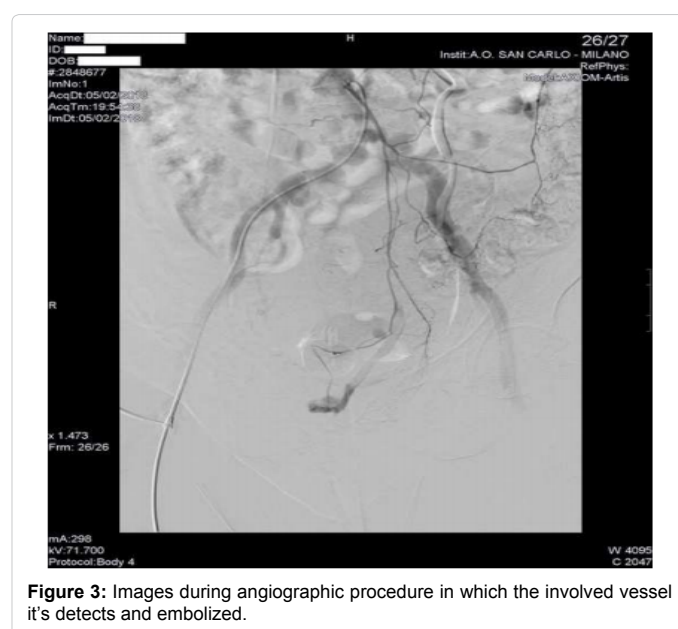
**Figure 1:** Muco-hemorrhoidectomy by Longo.



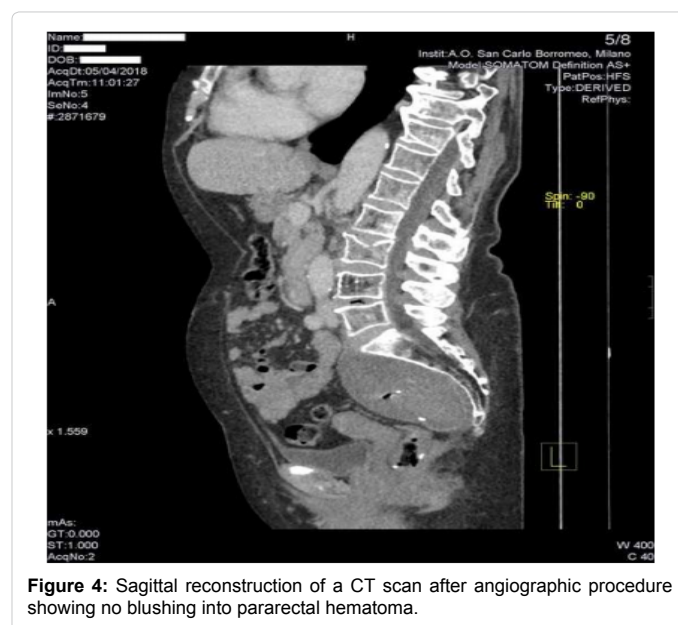
**Figure 2:** CT scan non-contrast and post-contrast in order to show arterial blushing in the retroperitoneal blood collection.

about 2 hours from surgery patient complained of cold sweating, severe pain in lower abdominal quadrants, and sign of hemodynamic failure (Arterial pressure 78/50 mmHg, heart rate 66 bpm). Blood sample were drawn, showing severe anaemia. Peritonism was not evident at physical examination. Anal tampon was removed, showing no evident source of bleeding (Figure 2).

An urgent abdominal CT scan has been performed, showing a large hematoma starting from perianal-perirectal region, extending up to retroperitoneum and actively bleeding. An urgent angiography with anaesthesiology support has therefore been performed: through ultrasound guided left transfemoral arterial access, a 5 Fr introducer has been placed. Through this access, selective arteriography of both ipogastric arteries showed active contrast agent spreads. Aortography performed subsequently shows a large active contrast agent spread supplied by an hemorrhoidal artery coming from inferior mesenteric



**Figure 3:** Images during angiographic procedure in which the involved vessel it's detects and embolized.



**Figure 4:** Sagittal reconstruction of a CT scan after angiographic procedure showing no blushing into pararectal hematoma.

artery. By using a 5 Fr catheter we proceeded to selective inferior mesenteric artery catheterization, and with a Progreat micro catheter, to super selective distal terminal branch catheterization of the artery involved in bleeding. We finally performed embolization with Glubran-Luf (1:3) of smaller vessels.

Angiographic last check showed complete exclusion of involved vessel, leaving other vessels unharmed. Procedure has been performed without any complication and led to complete resolution (Figure 3). Follow-up CT scan at 2 months after the event showed embolization efficacy and no contrast agent spread in the retroperitoneal hematoma, which was, at last, stable (Figure 4).

## Discussion

Bleeding is a very rare complication of mucohemorrhoidectomy by Longo which can be severe enough to be hemodynamically significant, leading the patient to hypovolemic shock if left without a promptly timed therapeutic intervention. Pain in the hours following the surgery, together with hypotension and acute anemization, prompts evaluation with contrast enhanced CT scan to detect the presence of active bleeding for which the only possibility of rapid, effective and minimally invasive treatment is represented by super selective arterial embolization of the affected vessel.

The CT scan must be performed both non-contrast and post-contrast with a three-phase study in order to document the effective presence of active bleeding and to guarantee an adequate pre-operative planning for the angiographic intervention. The best treatment consists of a super selective catheterization of the injured vessel responsible for bleeding in order to allow its complete exclusion but avoiding the exclusion of non-target vessels that would cause the onset of dangerous ischemic complications, potentially fatal for the patient. Super selective catheterization requires the use of a microcatheter that allows navigation within small calibre vessels, reaching the distal part responsible for haemorrhage.

The possible choice of embolizing material is wide and is influenced not only by the availability of the material itself but also and above all by the experience of the interventional radiologist. In expert hands the glue used in our procedure, appropriately diluted in order to obtain the appropriate density for the correct migration inside the vessel, allows the bleeding to be excluded quickly and definitively. Conversely, its use by operators with little experience can be risky as it increases the probability of inadequate migration of the glue leading to consequent

embolization of non-target vessels; other therapeutic options, therefore, could be represented by the use of spirals or large-calibre particles (greater than 500  $\mu$ m).

## Conclusion

The massive haemorrhage resulting from Longo's procedure is a very rare but dangerous, potentially fatal complication, bringing the patient rapidly into shock. However, it can be managed with a safe and effective arterial embolization procedure, which allows the exclusion of active bleeding in a super selective manner, preserving non-pathological arterial branches without ischemic complications.

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