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TECHNICAL NOTE

Manual hemorrhoidopexy in the treatment of hemorrhoidal disease

Carlo Tagariello

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Abstract Over the last 10 years a number of mini-invasive procedures have been introduced which have revolutionized the surgical treatment of hemorrhoidal disease. I would like to present a very effective method of approaching this disease with reduced postoperative pain. I have been using this technique since the year 2000 with excellent results. From 1999 to 2006 we used a proctoscope, especially, designed and patented by me to perform Doppler-guided ligation of the branches of the superior hemorrhoidal artery in the treatment of prevalently grade III hemorrhoids (THD method). Since 2006, we have performed the hemorrhoidopexy procedure alone, without Doppler-guided ligation of the arteries, and achieved excellent results (67 cases), with greater simplicity (easy-learning curve) and reduced surgery times. We use the "beak" proctoscope to this end, as it provides good illumination of the surgical field and enables the excision of areas of grade IV prolapse which are irreducible with this conservative technique.

Keywords Hemorrhoidopexy · Prolapsed hemorrhoids · Tailored surgery · Mini-invasive surgery

Introduction

Over the last 10 years a number of mini-invasive procedures have been introduced which have revolutionized the surgical treatment of hemorrhoidal disease. I would like to present a very effective method of approaching this disease with reduced postoperative pain. I have been using this technique since the year 2000 with excellent results.

C. Tagariello (✉)
Casa di Cura Villa Toniolo, 34, Via Toscana, Bologna, Italy
e-mail: ctaga@iol.it

Pathophysiology of hemorrhoids

The hemorrhoidal venous plexus extends in the submucosa of the lower rectum and anal canal. The function of internal hemorrhoids, i.e., situated above the dentate line, is to protect the highly delicate mucosa lining the anal canal during defecation. During defecation the rectal muscles contract and the anal muscles relax. The anal canal is reduced from a length of around 2.5–3 cm to around 1 cm, as the released anal sphincter thins and the dentate line moves toward the exterior. Due to the activation of arteriovenous shunts, the hemorrhoids fill with arterial blood, causing engorgement and forming vascular cushions which accompany the feces toward the exterior by intervening between the feces themselves and the mucosa of the anal canal, thus protecting it from possible insults from the fecal matter and avoiding anal fissures. This mechanism is possible, thanks to the laxity of the mucosa and the elasticity of the peri hemorrhoidal connective tissue. When defecation is complete, the rectum relaxes, the still elastic hemorrhoids rapidly reduce in size within the rectum above the dentate line and the anal sphincter closes.

Hemorrhoidal disease may be caused by a variety of factors. These include weakness of the venous structures, constipation or some other pathologic increase in intra-abdominal pressure, and dysfunction of the arteriovenous shunts with excessive arterial flow (hemorrhoidal bleeding is most commonly bright red). The hemorrhoids dilate and weaken, they lose their elasticity and during defecation prolapse, because they re-enter more slowly, the anal sphincter closes before they completely re-enter and

strangulates them. As time progress', this mechanism produces hemorrhoidal prolapse. This process concerns internal hemorrhoids which, therefore, become prolapsed and external. There are also hemorrhoids which are anatomically external in the submucosa of the anal canal or under the anoderm. Less frequently, these can dilate and become complicated with thrombosis. They are not the subject of this study, because they require traditional and purely excisional treatment.

Materials and methods

In 1999, we learned of the Morinaga procedure and we thought of applying it to our patients as we too were convinced that the Doppler-guided ligation of the six branches of the superior hemorrhoidal artery could diminish the excessive arterial flow to diseased and dilated hemorrhoids. As the device for performing the procedure was unavailable in Italy at that time, I decided to make our own instrument together with the assistance of Dr Dal Monte. Dr Dal Monte was in contact with the industry for the realization of the device. I was the operating surgeon and shall we say the one who made the substantial modifications to the instrument, which we later patented. When Morinaga's original device arrived in Italy, we noted that ours was much better for the purposes of arterial ligation. At that time, we were working on two fronts: (1) realization of the device: the patent bears my name first, then the name of my assistant Dal Monte and lastly the name of Bastia, the engineer who under my guidance made the impressions and molded the device; Fig. 1 shows the document detailing the characteristics of the patent and the names of the inventors, (2) confirmation that the Morinaga procedure, i.e., the ligation of the six branches of the superior hemorrhoidal artery, was truly valid as Morinaga himself claimed. In reality, we believed that ligation alone was not enough to solve the problems of our patients. Indeed, although the procedure achieved something in terms of bleeding, it achieved nothing in the treatment of prolapse. Therefore, in association with Doppler-guided ligation of the branches of the upper hemorrhoidal artery, we developed a procedure of hemorrhoidopexy according to the outline shown in Fig. 2. With this procedure, almost all of the around 500 cases of hemorrhoids I treated were resolved. As my experienced increased, I was able to establish that neither using Doppler guidance nor ligating all the arteries was necessary. Instead, with an anal retractor, performing manual hemorrhoidopexy in the areas where the hemorrhoids are dilated or prolapsed (Fig. 2) is all that is required. This tends to reduce the length of the procedure, both simplifying it and making it easier and more precise.

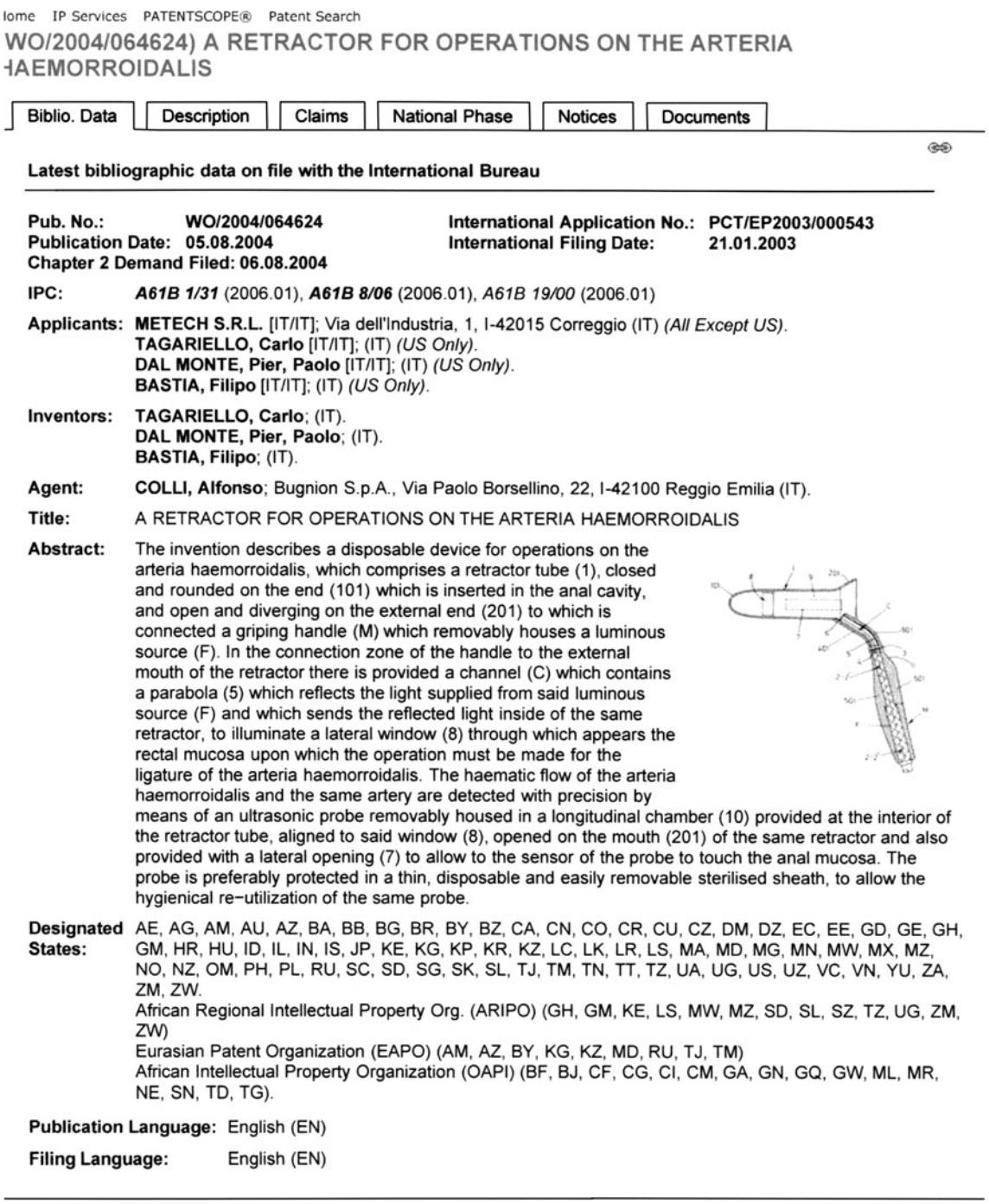
Subsequent to my work in this area and my modifications of the technique, the THD Method was made known. The effectiveness of the method, therefore, is not due to Doppler guidance, but rather to the association of the hemorrhoidopexy procedure which I developed.

Surgical technique

It is common knowledge that surgical procedures performed on the rectal mucosa cause a little discomfort, whereas the traditional hemorrhoidectomy performed with the incision of mucosa of the anal canal are accompanied by a painful postoperative course. The technique of hemorrhoidopexy which I developed in the year 2000 resolves the problem with reduced postoperative pain, because the procedure involves a lifting of the mucosa above the dentate line. I use "the beak" retractor (Fig. 3) and vicryl 0 or 00 thread with a very curved and robust needle. Once the engorged and prolapsed hemorrhoidal cushion has been identified, I apply a suture on the fixed mucosa immediately above and then, without ligating, I continue with a running stitch for a further three or four stitches terminating at least 1 cm above the dentate line.

Ligating the continuous suture produces a lifting of the prolapse and a repositioning of the dentate line, which is brought within the rectum. This fixation is repeated with other sutures on the other dilated and prolapsed hemorrhoidal cushions.

In addition to prolapse reduction, the ligation of the continuous sutures tightens and collapses the dilated and bleeding hemorrhoidal veins, which as a result disappear. After around 40 days the vicryl sutures dissolve and are replaced by a scar (easily visible in patients operated on several years ago) and the dilated veins disappear. Occasionally, when we ligate the suture 1 cm above the dentate line, we see that below it, close to the dentate line, there remain the engorged veins. These generally disappear within a few days, because as they are repositioned internally, they collapse and become decongested under the effect of the internal pressure which enhances venous flow. Occasionally, when necessary, in addition to the low-positioned suture, we apply a second line of continuous sutures in a higher position to accentuate the lifting effect (Fig. 3). This is a versatile and purely surgical technique: there is no need for Doppler guidance. The extent of the lifting is evaluated on a case-by-case basis with longer continuous suture, if the prolapse is especially marked or with the application of a second line of continuous sutures in a higher position (Fig. 4). Up on completion, we use a finger or a gauze swab introduced into and removed from the anus to verify whether the prolapse has been completely resolved. The length of continuous suture is adapted to the extent of the prolapse (tailored surgery).



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WO/2004/064624) A RETRACTOR FOR OPERATIONS ON THE ARTERIA HAEMORRHOIDALIS

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Applicants: **METECH S.R.L.** [IT/IT]; Via dell'Industria, 1, I-42015 Correggio (IT) *(All Except US)*.
TAGARIELLO, Carlo [IT/IT]; (IT) *(US Only)*.
DAL MONTE, Pier, Paolo [IT/IT]; (IT) *(US Only)*.
BASTIA, Filipo [IT/IT]; (IT) *(US Only)*.

Inventors: **TAGARIELLO, Carlo**; (IT).
DAL MONTE, Pier, Paolo; (IT).
BASTIA, Filipo; (IT).

Agent: **COLLI, Alfonso**; Bugnion S.p.A., Via Paolo Borsellino, 22, I-42100 Reggio Emilia (IT).

Title: A RETRACTOR FOR OPERATIONS ON THE ARTERIA HAEMORROIDALIS

Abstract: The invention describes a disposable device for operations on the arteria haemorroidalis, which comprises a retractor tube (1), closed and rounded on the end (101) which is inserted in the anal cavity, and open and diverging on the external end (201) to which is connected a griping handle (M) which removably houses a luminous source (F). In the connection zone of the handle to the external mouth of the retractor there is provided a channel (C) which contains a parabola (5) which reflects the light supplied from said luminous source (F) and which sends the reflected light inside of the same retractor, to illuminate a lateral window (8) through which appears the rectal mucosa upon which the operation must be made for the ligature of the arteria haemorroidalis. The haematic flow of the arteria haemorroidalis and the same artery are detected with precision by means of an ultrasonic probe removably housed in a longitudinal chamber (10) provided at the interior of the retractor tube, aligned to said window (8), opened on the mouth (201) of the same retractor and also provided with a lateral opening (7) to allow to the sensor of the probe to touch the anal mucosa. The probe is preferably protected in a thin, disposable and easily removable sterilised sheath, to allow the hygienical re−utilization of the same probe.

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Fig. 1 Characteristics of the THD patent and the names of its inventors

If the result appears to be unsatisfactory, i.e., the prolapse remains in one quadrant of the anal canal, traditional excision is performed at the level of that quadrant alone. Excision with the scalpel at that precise point alone causes less postoperative pain, than which would otherwise occur by excising in the three points according to Milligan Morgan procedure.

Results

From March 2006 to June 2008, 67 patients (36 males; mean age 48.6 years) with grade III hemorrhoids underwent this procedure. There were no postoperative complications. A total of 61 patients before the operation, reported frequent hemorrhoidal bleeding (>1/week). The mean

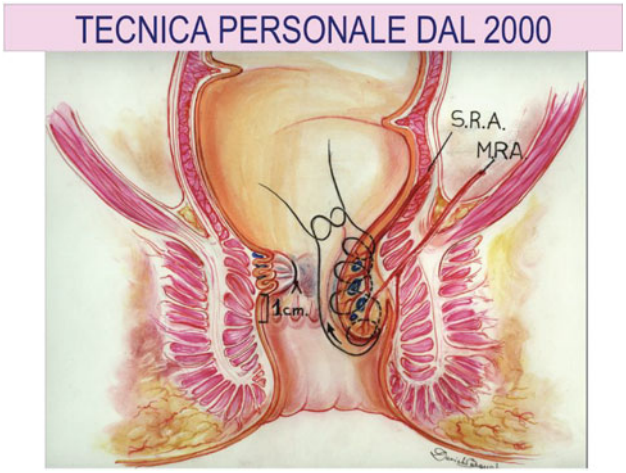

Fig. 2 The right side shows the continuous suturing, which includes the prolapsed hemorrhoidal cushion. On the left, after ligation of the continuous sutures the hemorrhoidal cushion is compressed within the knot and the hemorrhoids are obliterated. The knot is positioned 1 cm above the dentate line, in the rectal mucosa where it is not painful

Fig. 3 "The beak" proctoscope provides excellent direct vision for performing fixation above the dentate line

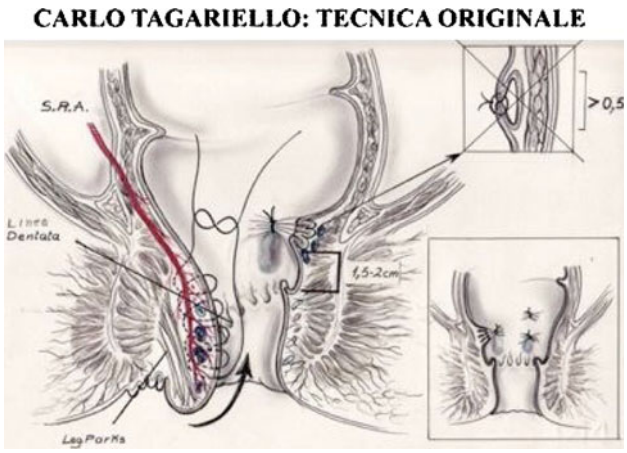

Fig. 4 The hemorrhoidopexy procedure returns the dentate line to its natural position, which was shifted externally following the prolapse. Below on the right, a second fixation can be appreciated above the first, which can be useful to accentuate the reduction of a significantly prolapsed hemorrhoid. The *area* above on the *right* shows the technical error of placing the sutures too far from each other: this produces a mucous bridge, which during defecation can break and bleed, even several days later

postoperative pain measured on a visual analog scale [1–10] was 1.38. All patients underwent follow-up for a minimum of 6 months (range 6–34 months). In 61/67 (91%) patients, the hemorrhoidal prolapse was resolved at mean follow-up, whereas in the others the prolapse was reduced to a subjectively acceptable level. Of the 61 patients who reported bleeding, symptoms were resolved in 56 (91.8%), whereas in the remaining 5 patients there was a reduction in frequency (mean 2/month) and quantity (subjective assessment). These 64 cases of manual hemorrhoidopexy alone followed up by me are linked with the nearly 500 previously performed procedures with THD + hemorrhoidopexy. In fact, because I established that arterial ligation has no influence on outcome, the long-term success of my previous procedures with THD [12–14] and those performed at other centers [6] is due to the technique of hemorrhoidopexy associated with the procedure. By this I mean that the good results obtained in the 64 cases of manual hemorrhoidopexy alone which I present in this study, which as yet have not had a sufficiently long follow-up period, can be associated with the good results achieved with THD + hemorrhoidopexy in the numerous cases with a sufficiently long follow-up period.

Discussion

Because there is no such thing as an ideal procedure for the treatment of hemorrhoidal disease, I would like to discuss the limitations of the procedure I have described.

This procedure cannot be applied to grade IV prolapses, where only the Milligan Morgan technique is effective.

This fixation procedure can, however, be associated with the Milligan Morgan technique in grade IV circumferential prolapses to internalize any mucous bridges which may remain congested and prolapsed externally.

After fixation, skin tags (which are not pathologic) remain external to the anal orifice. The patient should be informed of this to avoid undue concern of supposed incomplete healing.

The closer the sutures are to the dentate line, the greater is the possibility of postoperative pain. It is therefore important to remain 1 cm from the dentate line and avoid forcing the technique if the grade IV prolapse does not allow it. If after fixation it is clear that a poor result has been obtained in one quadrant, the procedure should be completed by removing the prolapsed hemorrhoid with the traditional incisional technique.

During the postoperative course the patient may feel a sense of obstruction, due to the suture knots and the bundled tissue internally. This gives the patient the false feeling of needing to defecate, and the patient should be informed of this preoperatively. This feeling may also be accompanied by postoperative pain upon defecation. The feeling of obstruction and pain lasts a maximum of 10 days and it can be easily managed with non-narcotic analgesics.

Although, it is conceptually different, a comparison should also be made with the Longo technique. In our procedure, the dilated hemorrhoidal tissue is compressed and reduced within the scar, whereas in the Longo technique, it is repositioned internally, where it may "return" to its physiologic function. In my opinion, this explanation is instrumental. It aims to validate the persistence of dilated hemorrhoids below the mechanical suture with a pathophysiologic justification. A dilated hemorrhoid bears permanent anatomic changes which do not regress simply by repositioning the hemorrhoids internally, just as varices of the lower limbs do not regress simply by wearing compression stockings. Therefore, the internal dilated hemorrhoidal tissue, left inside the rectum, predisposes the patient to recurrence. Theoretically speaking, a technical comparison should not be made on the homogeneity of two techniques, but rather on their effectiveness in resolving hemorrhoidal disease.

Without discrediting Longo's brilliant intuitions which paved the way to a new approach to hemorrhoid surgery, the hemorrhoidopexy procedure I propose has considerable advantages.

1. It is easy to perform and inexpensive; it only requires an anal retractor.
2. The reduction of the prolapse occurs at a lower level, i.e., by intervening on the mobile prolapsed mucosa and anchoring it to a point higher up on the fixed mucosa. The Longo technique which users a stapler intervenes higher up on the fixed mucosa and has a lesser lifting effects.
3. The continuous stitching done with vicryl 00 includes the hemorrhoidal cushion and therefore the hemorrhoids collapse within the suture knot and then within the scar which remains when the vicryl is reabsorbed. As I explained above, this is a different way of conceiving the resolution of the problem; i.e., the elimination of the dilated veins, not their internal repositioning.
4. The hemorrhoidopexy procedure I propose is performed under direct vision and therefore can be tailored to the specific needs in terms of the number of stitches required to obliterate the hemorrhoids and achieve the necessary lifting. The Longo technique in contrast is performed blind with a machine. As such, in unskilled hands, it has the potential to be dangerous and it does not allow a tailored approach according to the different degree of prolapse in the different quadrants of the anal orifice.
5. In the hemorrhoidopexy procedure, if the prolapse is found to be particularly marked—grade IV—and cannot be reduced, then it is excised at the point where the reduction was unsuccessful and only in that point, while fixation is continued in the other quadrants. Of course, there will be some pain due to the excision in that quadrant alone, but it will be less than the pain experienced in the Milligan Morgan technique with excision on three quadrants. This tailored approach, associated with the traditional excisional treatment, therefore provides a certain degree of versatility which is lacking in the Longo technique. Given these reasons, I believe the hemorrhoidopexy procedure will prove successful in the future, since it resolves the hemorrhoidal disease in most cases and can at any rate be associated with the traditional excisional technique in cases of grade IV hemorrhoids.
6. In addition, the hemorrhoidopexy procedure is not encumbered by significant complications, whereas there have been numerous cases of even severe complications following PPH, such as pelvic sepsis, rectovaginal fistulas, total obliteration of the rectum, severe chronic proctalgia and others reported by Pescatori in a recent study [11].

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