



Auditing the Results of a Surgical Team, In the Treatment of Prolapsed Haemorrhoid by Stapled Transanal Proctomucosectomy (Longo Operation)

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Abstract

The aim of this manuscript is to report the experience of a surgical team in the treatment of patients with prolapsed grades III and IV haemorrhoids, including total or partial circular prolapse, by Stapled Transanal Proctomucosectomy (STP) or Longo operation, having audited the outcomes of the first 636 patients operated by this method, during four years (2000–2004), in what concerns the operation duration, hospital stay, pain or discomfort postoperative, recovery to normal activity, complications and therapeutic efficacy.

In comparison with haemorrhoidectomy, in its various forms (Milligan and Morgan, Ferguson or diathermy), the results seems, in our experience, favouring the Longo operation because:

1. Although the duration of operation is identical, the Longo operation is less surgeon dependent (more easy to teach and doing, once the patients were treated, under surveillance, by surgeons with different graduation, technical differentiation and experience).
2. As this operation is a “painless” procedure without surgical wounds, the hospital stay is defined by the anaesthetic recovery.
3. Early and late pain is limited to level 3 in 10, and virtually non-existent defecation discomfort.
4. Recovery for work and normal activity of daily life is observed until the 5th of postoperative day.
5. According to our experience, the only complication of this procedure was haemorrhage, which occurred in 19 patients (3%), and only one patient requiring reoperation.
6. The therapeutic effectiveness was 87.4%. But we extended the indication to huge prolapse and grade IV prolapsed haemorrhoids and considered as “therapeutic failures” the two stage treatment, adequate to this extreme conditions.

Compared to haemorrhoidectomy, in its various forms, and according with the literature, the Longo operation having an equivalent efficacy to the Milligan and Morgan has, in addition to the above mentioned advantages, the absence of long term anal sequela because it is a purely rectal procedure.

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Introduction

The haemorrhoidectomy, in its various forms – Milligan and Morgan, Ferguson or diathermy -, was considered, for many years, the gold standard approach for the treatment of grade III or IV haemorrhoids, and, by some authors, admitted as a treatment also suitable in haemorrhoids grade II. For many years we have learned to perform these procedures and acquired a wide experience in its use. Until 2004 it was the approach we used preferably with overlapping results in the literature. However, these techniques, based on haemorrhoidectomy imply short, medium and long term, undesirable consequences, and can be associated with serious complications, some of them difficult to solve, such as faecal incontinence and scar stenosis of the anal canal.

Although it is relatively easy to excise the well-defined haemorrhoidal piles with moderate dimensions, on the other hand, it is very complicated, especially in cases of total or partial circular prolapse (bourrelet in French), as described by Tuttle in 1902, to ensure the conservation and sustainability of "mucosal bridges" necessary to prevent the scar stenosis of the anal canal.

With regard to postoperative pain, it is always associated with these techniques and it is more

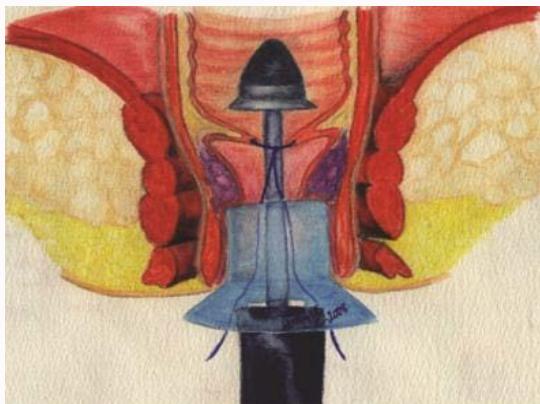


Figure 1: Introduction of the stapler exactly on anal canal axis.

or less intense and more or less prolonged causing the inevitable functional disability, and delay in the recovery of normal activity. These complaints, undervalued in published studies, have the effect of panic patients, making them delay the surgical treatment with all its disadvantages. Thus, associated with haemorrhoidectomy, in its various forms, we should consider, postoperative pain, the delay in recovery, bleeding and, more rarely, the infection. Belatedly, the anal stenosis, the residual fibrosis, the anal incontinence and soiling.

The anal stenosis, despite may be transient in most cases, is a constant consequence of all these techniques, and manifests itself in the medium or long term in severe cases. The residual fibrosis, which is constant and determines the existence of zones of lesser elasticity and resilience in the anal canal, favours the development of anal fissures and these lead to further anal fibrosis. Finally, the anal incontinence, which can be severe, related to a poor technique associated to sphincter injury, in a milder form may assume the aspect of soiling which is a frequent consequence of the excision of the haemorrhoidal cushions, which under normal conditions form a "hydrostatic valve" closing the anal canal and avoiding that slight but uncomfortable incontinence.

In 1999 having the first contact with this different kind of approach (STP), technique developed and published by Antonio Longo (Longo Operation), we performed the first one successful procedure. Enticed us its concept and good results, the ease of performing, its reproducibility, and above all, do not interfere with the anal canal, in what concerns its structure and function, the maintenance of the haemorrhoidal cushions and the near absence of pain and postoperative functional disability.

We considered particularly important the absence of scar anal fibrosis, that is constant in haemorrhoidectomy and here does not occur, since the anus is not involved. Moreover, as this procedure consists, in reality, a prolapse reduction, the existence of well individualized selvedge or pedicles does not hamper the technical approach. So, encouraged by the results and the safety referred in published articles, we started to practice this procedure in 2000 and treated 636 patients, between 2000 and 2004 (four years). It was essential to us to assess the results of this experience, a common practice in our team when introducing a new procedure. After this evaluation, taking into account the good results observed, we adopted, from 2004, the Longo operation, as our preferred technique for the treatment of grades III and IV haemorrhoids, and so far, we treated until now, around 4,000 patients.



Figure 2: Haemostatic anal plug, **A:** The soft tube in the centre to outwit bleeding; **B:** Introduction in the anal canal.

In this meantime we announced the procedure, participating in various meetings and organizing International Courses "Hands On". Finally, we accede to publish, now, the audit results of the first 636 operated cases and the method we used [1-3].

Patients, Material and Methods

We operated 636 patients with haemorrhoids, 76% of grade III and 24% grade IV, either by frankly individual pedicle or with partial or total prolapse interesting from about 180 up to 360 in the perimeter. The total or partial circular prolapse was not considered important, once, unlike what happens in haemorrhoidectomy, this does not affect the technique that is particularly useful in this circumstance due to its circular nature.

Gender and age seem irrelevant to the selection of this treatment modality.

Patients preparation was made with cleaning enemas in day "-2" at night, day "-1" in the morning and at night and in the morning of operating day, associated low residue diet from the day "-3" favouring the intake of liquids.

We gave all patients prophylactic antibiotic - Cefoxitin 1,000 mg IV before the operation. The use of prophylactic antibiotic before the operation result of the fearing of septic complications (Today, long after the analysis that this study reports, we know that these complications invariably are due to incorrect technique and antibiotic therapy has no preventive role).

The type of mainly applied anaesthetic was spinals. This choice, we do not consider particularly suitable as the preferred technique, depended mainly from Anaesthesiologist option.

We used the Circular Stapler PPH® from Johnson & Johnson and later CPH® developed by Check which is equivalent devices. Occasionally we used some similar staplers, some of them made in China, but their quality was not suitable according to the tests we made.

We fulfil the steps of the technique such as described by Longo:

sub mucosal "tobacco pouch" suture, interested only mucosa, with monofilament 0 to 00 with a 5/8 circle cylindricalatraumatic needle, placed high in the rectum, above the base of the haemorrhoidal piles pedicle, which is between 5 and 7 cm above the anal canal; placement and introduction of the stapler exactly on anal canal axis (Figure 1); waiting for about 2 minutes with the stapling closed before firing and after a further 3 minutes before removing it (this manoeuvre is to prevent bleeding and despite it was recommended both by technical introducer Antonio Longo, either by the manufacturer of staple machines Johnson & Johnson, was abandoned by our team after the 100 first cases, since having no relation or with bleeding or clotting times).

We always put a haemostatic anal plug in the centre of which put a soft tube (Figure 2) to outwit bleeding. Thus, we obtain an assessment of the volume of losses and we can monitor them. We believe significant loss greater than or equal to 100 cc, determining that do buffering three Foley catheters with inflated balloons, for about 6 to 12 hours [3-5].

The patients were evaluated in the first week, first month, 6 months and 1 year after surgery and the mean follow-up was about 2 to 3 years. Out of these periods any patient was promptly observed in the case of any complaints. The observations made in the first week and first month, unless there are suspected complications, did not involve anuscoppy to preserve the suture from trauma [6]. And that is still our practice.

In our study we selected the following parameters to be evaluated:

- a) Operation duration independently the surgeon is a graduate or a trainee;
- b) Days of hospitalization;
- c) Pain or discomfort;
- d) Recovery to normal activity;
- e) Complications;
- f) Therapeutic efficacy

The incidence of pain or discomfort was evaluated under two perspectives: the early pain (up to 48 hours), and the late pain, either after the 48 hours, or following a free interval of complaints [7-10]. In assessing the late pain was given particular relevance to the screening and characterization of pain and discomfort during defecation, as they are the main complains after haemorrhoidectomy.

Although septic complications may appear, more frequently associated with the straight perforation when the suture is deeper or stapling is not made respecting the axis of the anal canal, in our experience we just had bleeding, so we only could assess this complication.

With the objective to evaluate the effectiveness of this therapeutic modality, we consider: relapse, recurrence of the disease and what we call "insufficient treatment", which is related to limitations of the technique or the equipment and, according to our current experience, although involving a reoperation, it can be considered as a treatment in two stages.

This is not clear in the literature and is considered as relapse or recurrence, but we must know that recurrences occur in all types of surgical or instrumental treatment of haemorrhoid disease. In

spite of having extended this treatment to grade IV and selvedge haemorrhoidal prolapse, prone to a two stage treatment, to ease the discussion, we considered as treatment failure all the patients that were not completely treated at the first operation.

Operation duration

Although the first cases had been operated by senior surgeons, the last patients were operated also by younger surgeons and trainees, once we understand to be an easily reproducible and easy to learn procedure, after about 10 aid and adequate preparation from a theoretical and practical point of view [11,12]. The mean operation duration was 20 minutes (12' to 40'). There was no relationship between this and the degree of differentiation of surgeons.

Hospital stay

As there is no need to hospital care before the operation (now we currently perform this procedure in Ambulatory Surgery or Overnight Surgery regime) we analyzed the postoperative hospitalization period, which seems most appropriate [14]. Thus, considering only this period, the mean postoperative length of hospital stay was 1.1 days (1 to 3 days). The longer hospital stays (3 days) result from active postoperative bleeding, which occurred in 19 patients (3%), and syndromes post spinal anaesthesia which we believe to be a bad choice.

Pain or postoperative discomfort

Pain was assessed on a scale from 1 to 10, based on complaints of patients and analgesic consumption. Although with some subjective component, the pain related to the operation is one of the most important factors in the treatment of haemorrhoids, reason that seemed to us essential to assess [15]. Moreover, in the literature, this kind of pain evaluation is also used in other therapeutic modalities, including haemorrhoidectomy. So we distinguished:

- a) Postoperative early pain** (until 36 or 48 hours if started within 24 hours after surgery)

Never exceed the level 3 (3 of 10), ranging between 1 and 3. The level 3 pain occurred only in very rare cases representing about 5% of all. Consequently, practically the patients do not consumed analgesics. The incidence of the rare cases of more severe pain (level 3) we believe was associated with relatively low suture lines (distal), as it decreased over the experience [16].

- b) Postoperative late pain** (between the 2nd and the 5th day)

Occurred in 14% of cases, and never exceeded the level 3, in almost all cases was associated with one of two circumstances: low suture lines, involving the pedicles, or residual disease, this means, large prolapse that could not be completely reduced after surgery. We believe that in this particular circumstance it is associated with some form of trauma caused by the anuscope device.

In any case, it should be noted that the Postoperative pain, although in a subjective evaluation, has always been slight (maximum level 3 in 10) and rare, only in about 19% of all patients either early or late pain exceeded the level of a slight discomfort and reached the level 3.

In the evaluation of postoperative pain, there is, from our point of view, two very important aspects: the defecation pain and the defecation discomfort.

Defecation pain was not reported by any patient in the first

postoperative defecation, but there were, however, a small percentage of patients that referred late defecate pain or a stronger discomfort [17-20]. These patients were divided in two groups: patients with residual disease, and therefore candidates for reoperation; and a very small percentage of patients in whom the suture was low, corresponding to a technical error.

The discomfort defecation is hard to account and evaluate, due to its subjectivity. Was not mentioned spontaneously by patients, and when referred was always been very light, unless associated to pain and urgency to defecate.

Complications

The complications of this procedure (Longo operation) may be of four types: haemorrhage, septic complications (associated with fistulas or perforation of the rectum), rectal stricture due to a bad suture line with a rectum spiral, and chronic pain with intense defecation pain related to intra anal or very low rectal sutures.

We just had, as complication, the haemorrhage, in the 636 patients we treated. Thus, scrupulously practicing the technique described by Longo and Stutto, we had no septic complications, or fistulae, strictures or chronic pain [21-25]. So, we only will analyse the haemorrhage. This may appear early (immediate postoperative) or lately (late in postoperative).

As early haemorrhage or perioperative haemorrhage, we consider significant a bleeding equal or greater than 100 cc. As we leave a haemostatic plug into the canal anal, whose centre we put a soft tube to outwit bleeding, we obtain an assessment of the volume of losses and we can monitor them. In these cases we try to control bleeding by tamponade with three Foley catheters with the balloons inflated, during around 6 to 12 hours. This type of buffering has proved effective in almost all cases of bleeding having only one that need an intervention for haemostasis review. Thus, in 636 patients the haemorrhage was significant in 19 (3%) being resolved with tamponade in 18 patients and requiring reoperation for revision of haemostasis in one patient (0.2%).

Late bleeding was considered as the occurrence of a haemorrhage between 1 week and 4 weeks after surgery. It occurred very sporadically and was usually scarce and easily controllable. Those that took place between the first and second weeks, were the most frequent and related to patients under antiplatelet therapy, between the third and fourth weeks occurred only in two cases (0.3%).

In assessing the late haemorrhage, we must consider the possibility that not all patients have referred, or properly valued, the occurrence.

Recovery for work and normal activity

In most cases all patients were able to return to work and normal activity of daily life around the fifth postoperative day, referring significant improvement with the treatment, even those who had residual disease or pain associated with low sutures. Adds the fact this is a non wounds procedure.

Therapeutic effectiveness (residual disease, relapse and recurrence)

Of the 636 patients operated, only 80 (12.6%) needed reoperation, what means the therapeutic effectiveness was 87.4%.

As, according to our opinion and practice, we operated grade IV and selvedge haemorrhoidal prolapse, not all cases that require a second intervention correspond to a recurrence or relapse. In fact,

most of them were associated to large prolapse, in which the option of a second operation as a two stage treatment must be considered, given the limitations of size of stapler.

Of the 80 patients a second Longo operation was performed in 48 (7.6%), and 32 patients (5%) required a haemorrhoidectomy, but limited to one or two waste pedicles. In these cases, we admit that there is what can be considered therapy failure, once the residual pedicles correspond to a technical inefficiency or a runtime error. These pedicles are, usually, much larger than the rest and require a more appropriate and tailored approach.

So considering those circumstances what we can consider a "real" therapeutic failure occurred only in 32 patients (5%) which may mean a therapeutic effectiveness of 95%.

Discussion

The stapled transanal proctomucosectomy with proctomucosopexy (Longo operation) is based on two principles: first, the rectal mucosal prolapse leading to the prolapse off the haemorrhoidal cushions causes impairment of blood drainage in these structures as the veins are distorted. This causes the vascular engorgement, oedema, swelling and mucosal ulceration [26]. Thus, the treatment must be based on prolapse reduction with the replacement of the haemorrhoidal cushions, in order to regain their normal venous drainage, promoting the *restitutio ad integrum* of these lesions; second, the haemorrhoids or haemorrhoidal cushions act as a hydrostatic valve, sealing the anal canal, and improving the continence, mainly the continence of the rectal mucus avoiding what we call the swelling. So, the treatment of haemorrhoids must have in mind to preserve, whenever possible, the haemorrhoidal cushions and their function.

The Longo operation meets these two objectives and reducing the prolapse, normalizes the vascularisation and the venous drainage of the haemorrhoid cushions, and reduces the swelling, the vascular engorgement and the mucosal ulceration, leading, over time, to an improvement or recovery of changes caused by the prolapse, without sacrifice of the haemorrhoidal cushions and their function.

Indeed, in our experience of about 16 years of practice, we observed, in most cases, a complete or almost complete recovery of the total or partial circular prolapse, after replacement. This seems to occur in a period of up to one year, after which we have the notion that there is no further evolution. Based on that and, contrary to what we did in these first 636 patients that we treated, now we postpone one year the definition technical failure and in consequence a second operation, unless it occurs an exceptional situation of particular severity. This attitude resulted in a great decrease in reoperations and so called therapeutic failures.

According to the analysis we made in this first 636 patients treated by this method, is a well-tolerated procedure, with levels of pain and discomfort that, at most, reach the level 3 (3 in 10), that does not exceed the first week, except in cases related to a technical error (too distal suture). Even in these cases, pain or discomfort did not exceed two weeks. It provides a quick recovery with resumption of work and normal activity within less than a week. Is a safe procedure if one respects the correct technique, which seems to be easy, with a low rate of serious complications? In a correct practice the complications are limited to haemorrhage, generally with low incidence, low severity and of easy resolution [27]. In this study only 3% of patients had postoperative bleeding, and only one (0.2%) required reoperation.

The early postoperative bleeding may have some unclear relation with the magnitude of the disease, but no relation with the patient's medication. On the other hand, when occasionally we used different manufacturing staple devices more bleeding occurred, which leads us to think that there may be a relationship that relates the occurrence of bleeding with the quality of the device.

As for surgical sequels, the procedure does not affect the anal canal, leaving no scarring areas that are weak points less elastic and more prone anal fissures. As well, and for the same reasons, the scar stricture of the anus is a non-existing problem. Finally, the preservation of haemorrhoidal cushions keeps all the mechanisms of anal continence.

This aspect of fibrotic and scar "weakness" of the anodermis and mucosa, or the impaired continence and soiling, are particularly important consequences of haemorrhoidectomies but they are not particularly referred or valued, in most published articles [27-30].

Also the way the operation is well tolerated by patients, allows, in large and complicated prolapsed haemorrhoids, to envisage the implementation of a two stage treatment which is well accepted by the patients.

Also, not providing the pain or morbidity that associated with haemorrhoidectomy, the Longo Operation enables a greater adhesion to surgical treatment and processing of a larger number of patients at earlier stages of the disease, grade II/III, at which the results of any such intervention are the best with the easily execution.

Now with a greater experience we can state that the modality "treatment in two stages", corresponds to an absolutely accepted therapeutic strategy, associated with good results. Thus, the residual disease should not be considered treatment failure. It can be treated with a second Longo operation, because the total or partial circular prolapse was not fully resolved in the first procedure. Relapses or recurrence of the disease have not been observed, certainly occur, but much later, in a period that exceeds our patient tracking capability, i.e. after 4 to 5 years of surgery.

The technique is easily reproducible and, therefore, can be performed by surgeons less differentiated, when properly trained and oriented.

Finally, the situations of total or partial circular prolapse, that always causes complicated technical problems in any type of haemorrhoidectomy with a considerable risk off of stenosis, can be treated by Longo operation in one or two stages with less morbidity than any type of haemorrhoidectomy without stenosis risky.

Referring to noticed literature, the comparative studies are limited to compare the Longo-operation with the Milligan and Morgan. Very few are multicentre studies; is given little emphasis on long-term results, with very few studies and referring to periods of follow-up ranging from 1.5 to 3.5 years and, finally, it is given great importance to the changes defecation but then concludes that its incidence is not significant.

We noticed that in the literature as well, compared to haemorrhoidectomy Milligan and Morgan, Longo Operation:

1. Has less pain, shorter hospital stay and faster recovery to normal activity;
2. One year after surgery both have the same effectiveness

in solving symptoms;

3. In a study with two years follow up: the incidence of late complications was the same (faecal impaction in Milligan and Morgan and pseudotrombosis in Longo); sphincter function alterations were identical and equal incidence (12% urgency, change of continence 10% and tenesmus 3%); the residual prolapse had an incidence of 7.5% on the Longo operation and only 1.8% in Milligan and Morgan. But we must notice that the residual prolapse of Longo operation can be solved with a second operation with much less morbidity and pain in the two procedures than in one Milligan and Morgan. On the other hand, the residual prolapse after Milligan and Morgan procedure cause a greater risk of stenosis if e second Milligan and Morgan is done;

4. Also according to the literature, the success percentage evolves from 92% at 1 year to 89% at 2 years (87.4% In our experience) and in the case of grade IV haemorrhoids the risk of haemorrhage and, as expected most as well as the need for reoperation (usually well accepted by the patients), which is more frequently at most 43%, but after this previous results equal;

5. Considering the scarce numbers of most of the series, the reluctance to include haemorrhoids grade IV and some such complications in our experience did not pass immediate and transitional effects, such as defecation urgency, we think this techniques accepted with some reserve which could have led to a prudent selection of patients and this would explain the good results.

As for the analyzed aspects it seems to us that we should consider that literature, especially in comparative studies, considered with the same importance sequels and transient disturbances which naturally changes the nature of the results.

From our experience with haemorrhoidectomy techniques, including Milligan and Morgan, which undoubtedly was the most we practiced, we consider significant adverse aspects:

a) Pain: Intense and incapacitating or in the Postoperative Period Immediate or Delayed the pain or the pain will defecation, conditioning this rather the occurrence of fecalomas by defence reaction and retraction of the patient.

b) Scar fibrosis of anodermis and mucosa with decreased elasticity and brittleness at increased risk of fissures. In cases of very lush haemorrhoids requiring large resections, or in case of necrosis "mucosal bridges", can have the same scar stenosis that are very difficult to solve.

c) Changes of continence are the most frequent condition of Soiling and may determine itching and skin changes. These changes are a final mode is not noticed on the long operation, but on the other hand had some incidence of Urgency defecate by increasing the pressure on the "cup" of the distal rectum, anal just at the place where they are nerve receptors defecation. This sensation disappeared by the 5th day and lasted only exceptionally in one case up to 3 months (associated with development/resolution to sub necessity of a manual suture for haemostasis during surgery).

Conclusions

From the analysis we made of the stapled transanal proctomucosectomy with proctomucosopexy (Longo operation), the first 636 patients we treated, we can conclude:

1. The operation has a therapeutic efficacy similar to haemorrhoidectomy in its various forms: is feasible and effective with good results in grade IV haemorrhoids and large prolapse, if one accepts treatment in two stages, in most cases very well accepted and tolerated by patients.

2. The procedure does not interfere with the anus, unlike haemorrhoidectomy, causes no harm nor leave permanent sequela, such as scar fibrosis that, reducing its elasticity, promote the occurrence of cracks.

3. Preserving the haemorrhoidal cushions and its role of hydrostatic valve, unlike haemorrhoidectomy that dry out, preserves or improves anal continence, not being associated with soiling, itching or other consequences of haemorrhoidectomy.

4. It is virtually painless and the occurrence of pain has a very short duration, is not associated with defecation pain and discomfort it causes is short (about 1 week) and very well tolerated. The analgesic consumption is virtually nil in the postoperative period.

5. It provides a quick recovery, even in cases of advanced disease, this being obtained in the first week.

6. Corresponds to a technique easy to teach and play, so it is easily performed even by surgeons with little differentiation, and Trainees.

7. No need for postoperative care after the first hour and practically does not require medication.

8. Although a significantly more expensive operation than the methods of haemorrhoidectomy, it seems economically viable and rewarding a social economic perspective.

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