



## Stenosis after Stapled Anopexy: Personal Experience and Literature Review

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### Abstract

**Purpose:** Post-operative stenosis following SA is a rare complication, however it can be strongly disabling and require further treatments. Objective of the study is to identify risk factors and procedures of treatment of stenosis after Stapled Anopexy.

**Methods:** 237 patients subjected to surgical resection with circular stapler for symptomatic III-IV degree haemorrhoids without obstructed defecation disorders. 225 cases (95%) respected the planned follow-up conducted for one year after surgery.

**Results:** Stenosis was noticed in 23 patients (10.2%), 7 of which (3,1%) complained about "difficult evacuation". All patients reported symptomatology appearance within 60 days from surgery. Previous *rubber band ligation* was referred from 7 patients (30,43%) and painful post-operative course (VAS>6) was referred from 11 (47,82%) of the 23 that developed a stenosis. These values appear statistically significant with  $p < 0.05$ . Previous anal surgery and number of stitches applied during surgical procedure do not appear statistically significant. Symptomatic stenosis was subjected to cycles of outpatient progressive dilatation with remission of troubles in six cases. A woman, did not get any advantage, was been subjected to surgical operation, removing the stapled line and performing a new handmade suture.

**Conclusion:** The stenosis that complicate Stapled Anopexy are high anal stenosis or low rectal stenosis and they are precocious, reported within 60 days from surgery. If intense post-operative pain occurs (VAS>6), this appears to be related to development of a symptomatic stenosis. Surgery is avoidable in most cases and conservative treatment, as outpatient dilatations, has to be carried out.

**Keywords:** Stapled hemorrhoidopexy; Stapled anopexy; Rectal stenosis; Anal stenosis

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### Introduction

Surgical treatment of the haemorrhoidal disease was been modified from the introduction of the techniques encoded by Antonio Longo [1]. These procedures have progressively established themselves and in 2010 the National Institute for Health and Clinical Excellence (NICE) carried out a wide bibliographic research and finally recommended Stapled Anopexy (SA), with an I\A Level of Evidence, as the better surgical technique to treat patients suffering from haemorrhoidal symptomatology.

As a matter of fact, all the considered surveys demonstrated that SA produced - as compared to the traditional Haemorrhoidectomy - a minor post-operative pain, a quicker recovery of the surgical site, a faster recovery of the regular bowel activity, an early resumption of work and also a great satisfaction of patients [2-4]. This indication is presently outstanding, as it is necessary to wait for the updating expected by NICE for 2015.

This technique is not free from complications, however, and some of them, such as post-operative hemorrhage, has been duly studied and deeply evaluated [5-8].

Post-operative stenosis following SA is considered a rare complication with a scarce impact on the post-operative course of the patient: the survey of literature appears lacking in clinical research to this purpose [9]. When stenosis occurs and is symptomatic, however, it can be strongly disabling and require further treatments, that significantly extend the healing time [10].

We thought it was therefore proper to carry out a survey of our record of cases and compare it

with the data of the recent literature, in order to identify risk factors (primary outcome) and treatments (secondary outcome) of stenosis following SA.

## Materials and Methods

During the period January 2010 – December 2014 we have subjected 237 patients (113 men and 124 women with average age of  $54.6 \pm 16$  years) to transanal resection surgery by circular stapler, because anal prolapse symptomatic for 3<sup>rd</sup> to 4<sup>th</sup> degree hemorrhoid disease without symptoms of obstructed defecation.

All patients was subjected to a careful clinical-anamnestic evaluation with proctoscopy and, in consideration of what appeared, to a colonoscopy and/or virtual colon CT, anorectal manometry, trans-rectal ultrasound test, Rx-defecography or Dinamic Magnetic Resonance-defecography. Symptoms referred from the patients were bleeding, prolapse, pruritus, soiling: no one referred for obstructed defecation. Previous local treatments had been the following: rubber band ligation for hemorrhoid (29), sclerotherapy (1), fistulectomy\ fistulotomy (3), sphincterotomy (2) or fissurotomy (1) for fissure. On Table 1 we describe the characteristics of the patients enrolled. No patient was subjected to mechanical bowel preparation, while all of them were subjected to intravenous antibiotic prophylaxis with Cefazolin 2 gr and Metronidazole 1.5 g and pharmacological antitromboembolic prophylaxis (calcium heparin or natrum heparin) and elastic compression stockings prophylaxis. Operations were mainly carried out with spinal anaesthesia (229) and in gynaecological position. The surgery technique followed Longo's directions: after introducing a dedicated Circular Anal Divaricator (CAD) the prolapse was evaluated by the insertion and withdrawal of a gauze swab. We have carried out a SA in 237 patients, performing a tobacco bag (polypropylene 2/0) 4 cm over the linea dentata and resecting the prolapse using a ppH 03 circular stapler (Ethicon Endosurgery<sup>®</sup>). Hemostasis was carefully carried out at the end of operation by transutural stitches (3/0 polyglycolic acid sutures) and a trans-anal haemostatic pad (Tabotamp - Ethicon Endosurgery<sup>®</sup>). Number of applied stitches was carefully recorded at the end of the operations.

## Statistical Analysis

The statistical analysis was carried out using the Chi-square procedure (C) and the Fisher's exact test (F) (SPSS version 21.0). Significant p values lower than 0.05 were considered.

## Results

A 225 patients (95%) have respected the routine follow-up that provides for a clinical evaluation with proctoscopy after one week and one month from surgery and, in absence of complications, after 6 months and 1 year. Stenosis was reported when we have find a stricture at the passage of the index finger and pediatric proctoscopy (18 mm) at the rectal exploration, independently from the symptomatology referred by the patient.

Surgery times have resulted to be between 18 and 40 minutes. Each operation has been planned as one-day surgery.

At the follow up we have identified stenosis in 23 patients (10,2%) (Stenosis Group - SG). Only 7 patients of them, 3,1% from all performed SA, were symptomatic and reported "difficult of evacuation": symptomatology was always reported within 60 days from surgery (range: 10-60 days – average: 25 days). 202 patients have not a recto-anal stricture (Control Group - CG).

**Table 1:** Patients characteristics.

Age (range)	54,6 (38-70)
Sex	Male: 113
	Female: 124
Previous treatment	Rubber Band Ligation: 29
	Sclerotherapy: 1
	Fistulectomy: 3
	Sphincterectomy: 2
	Fissurotomy: 1

Previous rubber band ligation was referred from 7 patients (30,43%) in the SG and from 22 (10,89%) in the CG. Such value appears statistically significant, with  $p < 0.05$  (F: 0,016; C: 0,0080; Odds ratio: 3,58). Likewise, out of the 7 symptomatic patients, 1 patient (14,3%) had been previously subjected to rubber band ligation treatment: such value does not appears statistically significant (F: 0,621).

Previous anal surgery was referred from 1 patients (4,34 %) in the SG and from 6 (2,97%) in the CG. Such value does not appears statistically significant, with  $p > 0.05$  (F: 0,535; C: 0,13; Odds ratio: 1,48).

Number of applied stitches was 1 or 2 in 16 (69,56%) in the SG and 156 (77,23%) in the CG, 3 or more than 3 in 7 (30,44%) in the SG and 46 (22,77%) in the CG: such value does not appears statistically significant, with  $p > 0.05$  (F: 0,439; C: 0,67; Odds ratio: 1,48).

11 patients (47,82%) in the SG suffered from a painful post-operative course (VAS>6). This occurred in 6 patients (37,5%) who did not report any disturbances from stenosis and in 5 patients being symptomatic for stenosis (71,4%). Post-operative hyperalgesia was however reported also in 33 patients (16,33%) of the 202 ones that have not developed any further stenosis. Both values appear statistically significant, with  $p < 0.05$  (F: 0,00116; C: 0,0003; Odds ratio 4,69). We did not subject to any treatment the non-symptomatic patients, while the ones who reported disturbances from obstruction have been subjected to cycles of weekly progressive outpatient dilatation. In six cases, we obtained a complete remission of disturbances with six-eight applications. A woman, did not get any advantage, was been subjected to surgical operation, removing the stapled line and performing a new handmade sutura. Results are shown on Table 2.

## Discussion

Stenosis following surgery treatment of the hemorrhoidal disease is a well-known clinical condition that complicates the post-operative course in 3% to 8.5% of the patients undergone to hemorrhoidectomy with open or closed technique (Milligan and Morgan, Ferguson, Parks.): in these cases a stenotic scar developing and is located at the medium or low anal canal [11,12]. The SA technique encoded by Longo, moving the surgery action by 3 cm over the linea dentata, play at the level of the lower rectum\higher anal canal, creating, if that occurs, a stenosis with different characteristics. In accordance with the Milsom's classification of post-operative stenosis, this should be the case of high anal stenosis, but most Authors, - and we agree with them - believe that these should be considered lower rectal stenosis, as they are subsequent to the resection of the rectal wall [3,13-15].

Also the classification of the stenosis degree is controversial, as it clearly appears that it is not possible to adopt the classification of the

**Table 2:** Stenosis on 225 patients (Follow up: one year).

		Non stenosis (%)	Stenosis (%)	p
Patients		202	23	n.r
Previous anal surgery		6 (2,97)	1 (4,34)	C: 0,13 (OR: 1,48; F: 0,535)
Previous Rubber band ligation		22 (10,89)	7 (30,43)	C: 0,0080 (OR: 3,58; F: 0,016)
Stitches	0-2	156 (77,23)	16 (69,56)	C: 0,67
	3->3	46 (22,77)	7 (30,44)	(OR: 1,48; F: 0.439)
Postoperative pain		33 (16,33)	11 (47,82)	C: 0,0003 (OR: 4,69; F: 0,0011)

anal stenosis (possibility of entering the index finger for the digital exploration) or rectal stenosis after a full-thickness anastomosis (possibility of crossing by the sigmoidoscopy). If this complication occurs after SA, this must be defined as “a chronic stricture of the rectal lumen that causes signs or symptoms of complete or partial obstruction” [3].

On this remark, it is evident how difficult it is to evaluate its real incidence, as it varies from 0% to 8% in the surveys that we have analyzed [16-23].

Different factors have been considered as elements favoring the development of stenosis after SA. There is an attractive theory that stenosis develops as result of micro-dehiscences of the suture line, followed by a submucosa phlogosis and the subsequent formation of retractile scar tissue [10,24]. Certainly, stenosis can be caused by the incorrect execution of the suture line, too low and/or with a wide resection of hemorrhoidal tissue, or asymmetrical, or too deep, or rather at full thickness [7,24-26].

In 2006 Yao et al. [14], analyzing his personal experience, identified in the previous hemorrhoid sclerosing treatment an important risk factor for post operative stenosis, while he did not report any impact by previous rectal-anal operations. These showed however a significant value of p (<0.01) in the survey carried out by Petersen in 2004 [3].

Finally, in 2008 Chew proposed a singular explanation of the development of the stricture, relating it to the formation of an exceeding anastomotic scar, similar to the one formed in the keloid scars: that would create a hypertrophic fibrous circumferential cord, overflowing from the linear edges [27].

It is moreover necessary to mention the unlucky occurrence of a tight stenosis of the lower rectum: this rare complication is related to technical mistakes such as the missed resection of the purse string suture, the wrong positioning of the purse itself or an internal rectal prolapse included in the purse and caught by the wrongly inclined stapler [6,28-33].

Most stenosis, as significantly noticed in our experience, is evidenced in the first four months from surgery, and both the precocious and the later stenosis are rare [6]. Sex does not seem to be a factor favoring the occurrence of stenosis [3].

The literature is poor in guidelines for the treatment of stenosis after resective anal surgery with stapler [7]. Common sense suggests that for all patients who report difficult evacuation after SA treatments, it is necessary to make sure that there is no muscular functional stenosis

or a residual prolapse, and that the stricture is related to the scar. The following treatment has to be adjusted to the length and diameter of stenosis and its distance from the anal edge [25]. Most literature agrees that the best and most satisfactory therapy is the progressive dilatation connected to a proper hygienic-dietetic treatment (6,10): dilatation can also be carried out with sedo-analgesia, in an outpatient centre or at home, in one session or, as more often necessary, with repeated cycles: this treatment must always be carefully conducted, in order to avoid serious complications [34], and successful is reported in over 95% of the cases [3]. Surgery - as also demonstrated by our experience - is unavoidable in only 1.4% of postoperative stenosis. The literature reports many and various surgical procedures, often similar to that applied to colonic stricture. Expansion anoplasty is widely employed for postoperative stenosis by Milligan and Morgan and can be useful in strictures localized at the anoderma level, that are consequences of incorrect “hemorrhoid resections” carried out with circular stapler. In 2003, Garcea proposed the partial or total resection of the scar followed by a manual adjustment of anastomosis. The Re-Stapling method, perhaps helped by opening of stenosis with a linear stapler, is the same one as used in colon-rectal anastomosis: there is not a real evaluation in the colon-proctological surgery but it undoubtedly opens up interesting consideration [35-40]. Most Authors considering trans-anal stricturoplasty (interruption of the fibrous pad in three-four points followed by re-adjustment of the rectal lumen) the technique of reference in this postoperative complication: it is safe and effective and, above all, it permits a day-surgery treatment without giving any discomfort to the patient [3,25].

Considering these uncertainties, we believe that the gold standard of the stenosis treatment is its prevention. To this purpose, we think it is appropriate to follow a careful surgery procedure, correctly preparing a uniform and symmetric suture line at 3 cm to 4 cm over the linea dentate [7] and carefully follow the patient’s course, placing particular attention to a possible intense post-operative pain (VAS>6). This must lead you to suspect a micro-dehiscence and, as such, must be treated with antibiotic therapy (3,14).

As a matter of fact, both in the survey carried out by Petersen in 2004 [3] and in the one by Yao in 2006 [14], and as significantly noticed in our experience, this symptom was connected to the development of stenosis with significant values of p (p<0.003 and p<0.01).

Therefore, in opposition to the statements of NLG about antibiotic prophylaxis, where they support its uselessness in the hemorrhoidectomy (1 A Level of Evidence), we think that the trans-anal resection surgery, even if carried out for hemorrhoid

symptomatology, should be considered at the same level as the colon-rectal resection surgery and, as such, managed with a proper prophylaxis.

## Conclusion

Stenosis is a possible complication, even if not a frequent one, after SA. It is a singular clinical situation that has no similar examples in proctological surgery: as a matter of fact, it is a rectal stricture that occurs after trans-anal surgery in absence of preparation of the perirectal tissues. In most cases conservative therapy is the only treatment, but 1.4% of patients' needs surgery correction. There are no certain prevention factors, but it is surely appropriate to follow a scrupulous surgical technique by executing a correct, uniform and symmetric suture line, 3 cm to 4 cm over the linea dentata. It is moreover important to carefully follow the patient's course. The presence of intense post-operative pain, probably also caused by anastomosis micro-dehiscence, should make you fear a successive development of stenosis.

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