

# Partial stapled hemorrhoidopexy: clinical aspects and impact on anorectal physiology

## *Hemorroidopexia por grampeamento parcial: aspectos clínicos e impacto sob a fisiologia anorretal*

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### ABSTRACT

**Objective:** to evaluate the impact of partial stapled hemorrhoidopexy on anorectal physiology, the complications related to this surgical technique, pain, postoperative bleeding and recurrence of hemorrhoidal disease one year after surgery. **Methods:** this is a prospective, descriptive study in consecutive patients with mixed or internal hemorrhoidal disease, the internal component being classified as grade III or IV, undergoing partial stapled hemorrhoidopexy. **Results:** we studied 17 patients, 82% of them with internal hemorrhoids grade III and 18% grade IV. The mean operative time was 09:09 minutes (07:03 to 12:13). The median pain in the immediate postoperative period evaluated by the numerical pain scale was one (0 to 7). The median time to return to work was nine days (4 to 19). No patient had anal stenosis and 76% were satisfied with the surgery 90 days postoperatively. When comparing the preoperative manometry data with that measured 90 days after surgery, none of the variables studied showed statistically significant difference. There was no recurrence of hemorrhoidal disease with one year of postoperative follow-up. **Conclusion:** partial stapled hemorrhoidopexy showed no impact on anorectal physiology, presenting low levels of complications and postoperative pain, without recurrence of hemorrhoidal disease in one year of follow-up.

**Keywords:** Hemorrhoids. Hemorrhoidectomy. Surgical Staplers. Surgical Stapling.

### INTRODUCTION

Hemorrhoidal disease affects millions of people around the world, and represents a medical and socioeconomic problem. It is estimated that 58% of the US population have hemorrhoids at 40 years of age<sup>1</sup> and approximately 10 to 20% of patients with symptomatic hemorrhoidal disease will need surgery<sup>2</sup>.

The surgical treatment for hemorrhoidal disease has undergone multiple modifications in recent times and the general trend went from total to partial excision of the anoderma excision.

Hemorrhoidectomy using the Milligan-Morgan technique is the most widely used technique in our country, being considered the most effective surgical technique for the treatment of hemorrhoidal disease<sup>3</sup>. However, this technique is still associated with significant postoperative pain due to trauma to the sensitive tissue of the anal canal.

Since the initial description of the circumferential-stapled hemorrhoidopexy by Longo et

al.<sup>4</sup>, in 1998, some modifications of the technique have been addressed and presented. Circumferential-stapled hemorrhoidopexy is characterized by circumferential resection of the lower rectal mucosa. Such a technique has become widely accepted as an alternative to the Milligan-Morgan hemorrhoidectomy in the treatment of third and fourth degree hemorrhoids.

Studies developed over the last decade concluded that the technique of circumferential-stapled hemorrhoidopexy is effective in the treatment of hemorrhoidal prolapse<sup>5-7</sup>, but fecal urgency in the early postoperative period and anal stenosis occur in 41% and 6% of cases, respectively<sup>7</sup>. These complications appear to be a result of total stapling in the lower rectum.

Partial stapled hemorrhoidopexy surgery (PSH) has as a differential proposal the partial resection of the structures of the anal canal, resembling, in a way, traditional techniques of hemorrhoidectomy, which also preserve parts of the anal canal. This, when compared to circumferential stapled hemorrhoids,

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seems to have the advantage of reducing fecal urgency rates and postoperative stenosis<sup>8</sup>.

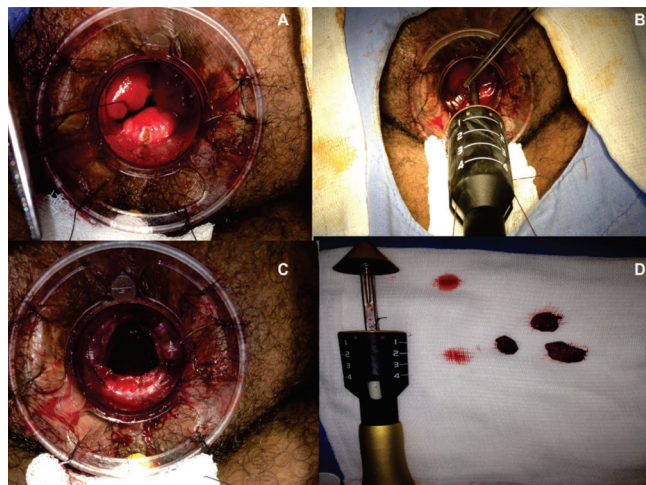
The present study aims to evaluate the clinical and anorectal physiological impacts generated by PSH.

## METHODS

We carried out a prospective, descriptive study in consecutive patients with hemorrhoidal disease of the mixed or internal type, the internal component being classified as grade III or IV, submitted to PSH. The aim of this study was to evaluate the impact on anorectal physiology by comparing anorectal manometry data performed in the preoperative period with those of the postoperative outpatient follow-up of 30, 60 and 90 postoperative days. We also evaluated outcomes related to complications of the surgical technique, postoperative pain and bleeding, and recurrence of hemorrhoidal disease after one year of surgery.

External hemorrhoids and presence of anal pilcoma were not exclusion criteria. We excluded patients with concomitant anorectal disease (fistula, fissure, abscess, inflammatory bowel disease, polyps or rectal cancer), acute hemorrhoidal thrombosis, coagulopathy or anticoagulant therapy, previous history of colon, rectum and anus cancer or pelvic cancer. We enrolled those who fulfilled the inclusion criteria, had no exclusion criteria and agreed to participate in the study through a specific informed consent form, previously approved by the Ethics in Research Committee of the Pedro Ernesto University Hospital of the State University of Rio de Janeiro (protocol n# CAAE: 21418413.1.0000.5259).

Partial stapled hemorrhoidopexy was performed with the patient in ventral decubitus, in a pocketknife position, and was initiated by transanal anoscope accommodation to expose the pectine line. We then introduced the fenestrated three-window anoscope into the anal canal, observing the volume of prolapsed hemorrhoidal tissue. We performed an "in pouch" suture of the prolapsed structures and introduced the circular stapler. We then fired the stapler, resecting the prolapsed tissues through the anoscope windows and "refixing" the mucosa previously removed from the anatomical position in



**Figure 1.** Partial stapled hemorrhoidopexy.

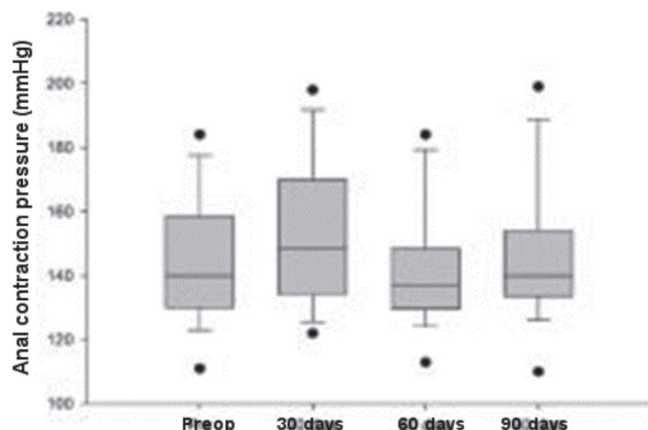
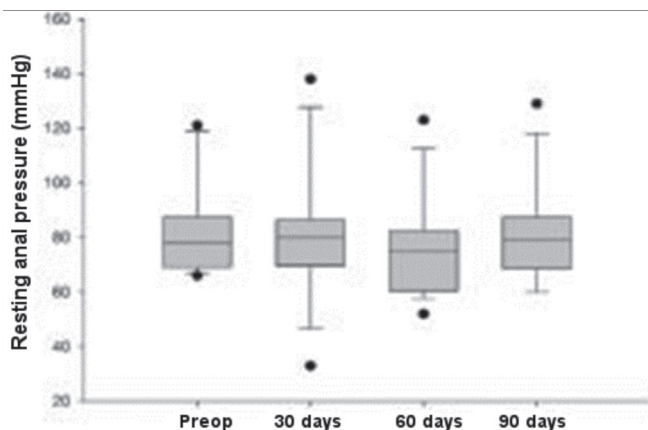
the anal canal and lower rectus (Figure 1).

The postoperative follow-up period was divided into immediate postoperative (24 hours after surgery) and outpatient follow-up (7, 30, 60 and 90 days, and one postoperative year). We evaluated the clinical aspects by numerical pain scale (NPS), date of first bowel movement, return to work activities, presence of postoperative bleeding, patient satisfaction with surgery and recurrence of hemorrhoidal disease.

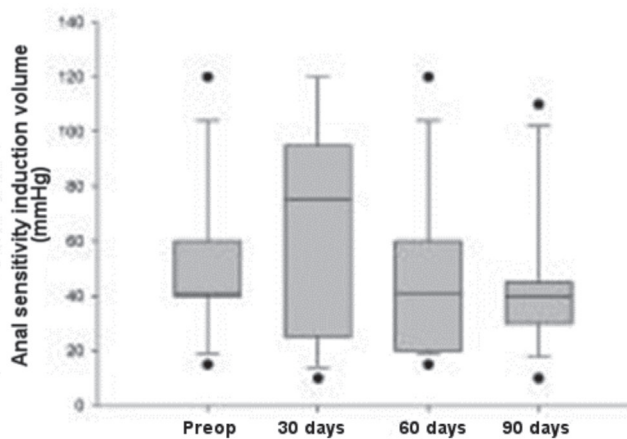
The postoperative pain evaluation was performed using a numerical scale of pain ranging from zero to 10, 10 referring to disabling pain and 0, to absence of pain.

We evaluated the anorectal functional aspects by computerized anorectal manometry in the preoperative period and at 30, 60 and 90 days after surgery. We assessed resting pressures and voluntary contraction of the anal canal, anal canal length, volume required to induce anal sensitivity, maximal rectal capacity, and recto-anal inhibitory reflex. We performed the computerized anorectal manometry with a water column catheter of eight radial channels.

We used boxplot graphs with the median, 10, 25, 75 and 90 percentiles and minimum and maximum values to demonstrate the statistical results. For those variables with normal distribution, we presented the results in column graphs (mean  $\pm$  standard deviation). We presented the comparison between the four moments for each variable with the Anova Oneway test (Mauchly test obeying the criterion of sphericity) with Greenhouse-Geisser correction. To compare



**Figure 2.** Computerized anorectal manometry: resting pressure, anal contraction pressure and sensitivity induction volume in the preoperative period and at 30, 60 and 90 postoperative days.



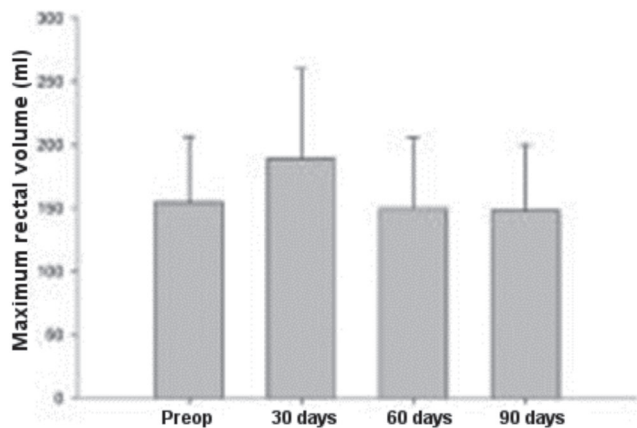
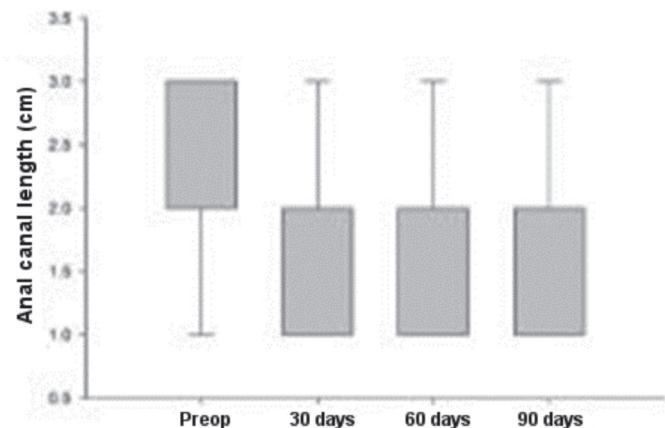
patients completed a one-year follow-up. The mean age was 53.5 years and 76% were women. In 82% of the cases, the main complaint was hematochezia, and in 18%, anal prolapse. Eleven patients (65%) had external hemorrhoids associated with anal plicoma. All cases had three hemorrhoidal cushions. Fourteen patients (82%) had grade III internal hemorrhoids and three (18%), grade IV. Four patients (24%) had chronic intestinal constipation.

the moments in the preoperative period with 90 postoperative days, we used the paired Wilcoxon test. We considered values for  $p < 0.05$  statistically significant.

## RESULTS

We conducted the study over a two-year period with 17 patients undergoing PSH surgery. All selected

The average operative time was 9:09 minutes (07:03 to 12:13). In 24% of the procedures there were technical difficulties related to the use of the three-window anoscope. In seven surgeries (41%) there was bleeding after stapling of the hemorrhoidal cushions. We controlled all bleedings due to stapling of hemorrhoidal cushions with 3-0 polygalacturin sutures. There was no resection of anal plicoma or hemorrhoidectomy of the external cushion.



**Figure 3.** Computerized anorectal manometry: anal canal length and maximum rectal volume in the preoperative period and at 30, 60 and 90 postoperative days.

The median pain in the immediate postoperative period (IPO) was one (NPS 0 to 7). Eleven patients (65%) presented bleeding in the IPO. Two patients (12%) presented urinary retention, requiring bladder catheterization for relief.

The median time between surgery and first bowel movement was six days (2 to 12). The median pain during the first bowel movement was three (NPS 1 to 4). The median return to work after surgery was nine days (4 to 19). Postoperative pain medians with seven, 30, 60 and 90 postoperative days were, respectively, 5, 3, 2 and 1.

Four patients (24%) presented hematochezia with seven days of PO. One patient had hematochezia with 30 days of PO. There were no cases of hematochezia after 30 days of PO.

On the seventh and 30<sup>th</sup> days, five patients (29%) presented urgency upon bowel movement. In the 60<sup>th</sup> and 90<sup>th</sup>, two of the five patients (12%) had a fecal urgency complaint. On return after one year, no patient maintained a fecal urgency complaint. No patient had anal canal stenosis.

Eleven patients (65%) were satisfied with the surgery after 90 postoperative days. With one year of OP, two patients (12%) were not satisfied. After one-year follow-up, no patient presented recurrence of hemorrhoidal disease.

Regarding the computerized anorectal manometry data, 15 patients had a recto-anal inhibitory reflex at the preoperative examination, which did not change in any patient during the 30, 60 and 90-day manometric evaluations after surgery. The variables resting anal pressure, voluntary contraction anal pressure and volume require to induce anal sensitivity did not present statistical significance for altered anorectal physiology ( $p>0.05$ ) when compared between postoperative periods, or when comparing the manometry at 90 days postoperative with the preoperative one (Figure 2). The anal canal length and maximum rectal volume had a normal distribution, so we presented the results in column graphs (mean  $\pm$  standard deviation), and they also did not present statistical significance for alteration of anorectal physiology ( $p>0.05$ ) when comparing the postoperative periods with each other, or when

comparing manometry of 90 postoperative days with the preoperative one (Figure 3).

## DISCUSSION

Due to lower postoperative pain rates, stapled techniques for hemorrhoidal treatment became widely diffused<sup>5-9</sup>. PSH surgery was developed based on Thomson's theory regarding the arrangement of hemorrhoidal cushions and prolapse of the anal canal mucosa<sup>10</sup>.

The great differential of this technique refers to the use of one, two or three-window anosopes, which provide prolapse only of those enlarged hemorrhoidal cushions, generating stapling of only the excess hemorrhoidal tissue and creating bridges of normal mucosa between the stapled tissue.

We performed all PSH surgeries with three-window anoscope. We opted to create data that could later allow the comparison of PSH with the Milligan-Morgan technique, in which there is resection of the hemorrhoidal cushions.

In the surgical procedure, the main technical difficulty was related to the introduction of the three-window anoscope (four patients) due to the disproportion between the diameter of the anoscope and the anal canal, generating perianal lacerations and anal bleeding.

The numeric scale of postoperative pain remained at low levels both in the immediate postoperative and in the outpatient follow-up. No patient had disabling pain and most had an early return to work activities. It is worth mentioning that this benefit does not seem to be directly related to PSH, but rather to the fact that it is a stapled surgical technique, such as circumferential-stapled hemorrhoidopexy, which does not generate anoderma lesions.

The high bleeding rates in the IPO (65% of the cases) are probably related to the applied questionnaire, since any blood residue in the surgical dressing was considered bleeding in the IPO. However, the seven-day PO (24%) hematochezia index was almost twice that of the PSH literature and almost four times higher than that for the Milligan-Morgan hemorrhoidectomy, but no bleeding occurred with clinical repercussion in the sample<sup>11-14</sup>.



The two patients that presented with fecal urgency with 90 days started this complaint after 30 days of follow-up. However, after one year, none of these patients maintained a fecal urgency complaint. The anorectal manometry of these patients demonstrated a significant reduction in the rectal sensitivity threshold and a reduced maximum rectal capacity with 90 days postoperatively. Because of the small number of patients, the presence of these two patients with fecal urgency provided greater fecal urgency rates related to PSH, than those found in the literature (11% versus 0.8% to 3%)<sup>8,10,14</sup>.

In no case, we resected the anal plicoma or performed hemorrhoidectomy of the external hemorrhoidal cushion, since such conduct is associated with a possible increase in postoperative pain.

Four patients (24%) were not satisfied with the surgery with 90 days of OP: two due to the presence of fecal urgency and another two due to the presence of a remnant anal plicoma. At one year, no patient maintained a fecal urgency complaint, and only those patients who presented with anal plicoma reported dissatisfaction, providing levels of postoperative satisfaction similar to those in the literature (88% versus 95% to 97%)<sup>8,9,11,15,16</sup>.

As for the manometric parameters, we found no statistical significance in relation to anorectal physiology in any of the variables studied when compared the postoperative periods with each other or with the preoperative period. However, there was a difference in the distribution of the anal canal length and anal sensitivity induction volume in the preoperative and postoperative anorectal manometry (Figure 2 and 3).

The length of the anal canal is affected by the excision and fixation of the hemorrhoidal cushions in the anal canal, generating a sustained reduction of the same in the three postoperative anorectal manometric assessments. The anal sensitivity induction volume is determined by the first rectal sensation (gas or feces) after insufflation of the balloon at the distal end of the anorectal manometry catheter. We observed that in the preoperative manometry the distribution of the patients regarding the anal sensitivity induction volume occurred between 40 and 60 ml. Ninety days after surgery, the induction of anal sensitivity occurred with 30 to 40 ml. This fact was probably generated by local surgical trauma associated with scarring and possible presence of fibrosis. Even so, none of these changes had any real impact with clinical repercussion on anorectal physiology.

To date, no group in South America has studied the clinical impacts and anorectal physiology of PSH. None of the studies available in the literature on this surgical technique had used computerized anorectal manometry to demonstrate the impacts of PSH on anorectal physiology, and our group was pioneer in using it to evaluate the method.

Despite the limitations of the descriptive single-site, limited-sample study, the data provided demonstrate that PSH may be a good treatment option for hemorrhoidal disease. Due to the easy technical execution, low levels of intra and postoperative complications, and sustained results after one year of follow-up, this study authorizes us to include hemorrhoidopexy by partial stapling in the arsenal of hemorrhoidal disease treatment.

## R E S U M O

**Objetivo:** avaliar o impacto na fisiologia anorretal da hemorroidopexia por grampeamento parcial, das complicações relacionadas à técnica cirúrgica, dor e sangramento pós-operatório e recidiva de doença hemorroidária após um ano de cirurgia. **Métodos:** estudo prospectivo, descritivo, em pacientes consecutivos, portadores de doença hemorroidária do tipo mista ou interna, com componente interno classificado como grau III ou IV, submetidos à hemorroidopexia por grampeamento parcial. **Resultados:** foram estudados 17 pacientes, dos quais 82% apresentavam hemorroidas internas grau III, e 18% grau IV. A média de tempo operatório foi de 09:09 minutos (07:03 a 12:13 minutos). A mediana de dor no pós-operatório imediato avaliada pela escala numérica de dor foi de 1 (0 a 7). A mediana de retorno ao trabalho foi de nove dias (4 a 19). Nenhum paciente apresentou estenose de canal anal e 76% ficaram satisfeitos com a cirurgia com 90 dias de pós-operatório. Comparando-se os dados manométricos pré-operatórios e após 90 dias, nenhuma das variáveis avaliadas apresentou diferença com significância estatística. Não houve recidiva da doença hemorroidária com um ano de acompanhamento pós-operatório. **Conclusão:** a hemorroidopexia por grampeamento parcial não demonstrou impacto na fisiologia anorretal, apresentando baixos níveis de complicações e de dor pós-operatória, e sem recidivas após um ano de acompanhamento.

**Descritores:** Hemorroidas. Hemorroidectomia. Grampeadores Cirúrgicos. Grampeamento Cirúrgico.

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