

CAN RESIDENTS SAFELY AND EFFICIENTLY PERFORM MILLIGAN-MORGAN, FERGUSON AND STAPLED HEMORRHOIDOPEXY?

Médicos residentes podem realizar com segurança e eficiência técnicas de Milligan-Morgan, Ferguson e grampeadores no tratamento cirúrgico das hemorróidas?

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ABSTRACT – Background - Surgery for symptomatic hemorrhoids is needed in almost 10% of the patients. Although, literature about the surgical management of hemorrhoidal disease is vast, data concerning hemorrhoidectomy or hemorrhoidopexy performed by training residents is limited. **Aim** - To analyze the results of these procedures in a teaching institution. **Methods** - Data from all patients who underwent surgical treatment for hemorrhoids from 1995 to 2007 in a single institution were retrospectively analyzed. Residents supervised by assisting doctors performed all procedures. Techniques were compared based on operative time, hospital stay, morbidity, and long-term efficacy. **Results** - Three hundred thirty three patients were included in the study, 182 males (54.6%), with a mean age of 45.3 years (\pm 12.02). Third degree hemorrhoids were the main indication (81.7%). Milligan-Morgan was the most commonly performed procedure (57%), followed by Ferguson and stapled hemorrhoidopexy. Mean operative time was significantly lower in the stapled hemorrhoidopexy group when compared to the open and closed procedures: $49,4 \pm 29,3$ min vs. $61,1 \pm 26,5$ and $67,1 \pm 28,3$, respectively ($p=0,0034$). There was no statistically significant difference among the groups regarding postoperative complications or reoperation rate. Length of stay was significantly higher in the Milligan-Morgan group when compared to Ferguson and stapled hemorrhoidopexy ($1,41 \pm 0,86$ days vs. $1,19 \pm 0,43$ vs. $1,16 \pm 0,37$ respectively). Symptomatic recurrence, reoperation rates and band ligation usage were similar among groups. **Conclusion** - Residents under supervision can perform Milligan-Morgan, Ferguson and stapled hemorrhoidopexy with low incidence of complications and good long-term results. Stapled hemorrhoidopexy technique was associated with a shorter operative time, while Milligan-Morgan correlated with a longer length of stay.

HEADINGS - Hemorrhoids. Hospitals, teaching. Hemorrhoidectomy.

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RESUMO - Racional - A cirurgia para hemorróidas sintomáticas é necessária em quase 10% dos pacientes. Embora, a literatura sobre o tratamento cirúrgico da doença hemorroidária seja muito grande, os dados relativos à hemorroidectomia ou hemorroidopexia realizadas por residentes de treinamento é limitado. **Objetivo** - Analisar os resultados destes procedimentos em uma instituição de ensino. **Métodos** - Foram analisados retrospectivamente os dados de todos os pacientes que se submeteram ao tratamento cirúrgico para hemorróidas entre 1995 e 2007 em uma única instituição. Residentes supervisionados realizaram todos os procedimentos. As técnicas foram comparadas com base no tempo operatório, permanência hospitalar, morbidade e eficácia a longo prazo. **Resultados** - Trezentos e trinta e três pacientes foram incluídos no estudo, 182 homens (54,6%), com idade média de 45,3 anos (\pm 12,02). Hemorróidas de terceiro grau foram a principal indicação (81,7%). Milligan-Morgan foi o procedimento mais comumente realizado (57%), seguido por Ferguson e hemorroidopexia grampeada. A média de tempo operatório foi significativamente menor no grupo hemorroidopexia grampeada quando comparado com os procedimentos abertos e fechados: $49,4 \pm 29,3$ min vs $61,1 \pm 26,5$ e $67,1 \pm 28,3$, respectivamente ($p=0,0034$). Não houve diferença estatisticamente significativa entre os grupos quanto às complicações pós-operatórias ou à taxa de reoperação. O tempo de internação foi significativamente maior no grupo Milligan-Morgan quando comparado com Ferguson e grampeamento ($1,41 \pm 0,86$ dias vs $1,19 \pm 0,43$ vs $1,16 \pm 0,37$, respectivamente). Recorrência sintomática, taxas de reoperação e o uso de ligadura elástica foram semelhantes entre os grupos. **Conclusão** - Os residentes sob supervisão pode executar Milligan-Morgan, Ferguson e grampeamento hemorroidário com baixa incidência de complicações e bons resultados a longo prazo. O grampeamento foi associado com menor tempo operatório, enquanto Milligan-Morgan foi correlacionada com maior tempo de hospitalização.

DESCRITORES - Hemorroidas. Hospital de ensino. Hemorroidectomia.

INTRODUCTION

Surgery for symptomatic hemorrhoids is needed in approximately 10% of the patients². Several surgical techniques have been described for the management of grade III and IV hemorrhoids and the choice usually lays on the surgeon's preference. During the last century open and closed hemorrhoidectomies were proposed by Milligan-Morgan¹⁷ and Ferguson⁶, respectively, and became the most popular methods for treating this condition. Since these procedures cause considerable postoperative pain and, sometimes, a long and troublesome recovery, Longo¹⁶ proposed a stapled hemorrhoidopexy (PPH) allowing less postoperative pain and a faster recovery. This technique quickly became popular worldwide. Together these three procedures are the most commonly performed nowadays, achieving great results in the treatment of third and fourth degree hemorrhoids. Although, literature about the surgical management of hemorrhoidal disease is vast, data concerning hemorrhoidectomy or hemorrhoidopexy performed by training residents under supervision in a teaching institution is limited and only a few studies can be found regarding teaching and learning anorectal procedures^{1,10}.

The objective of the current study was to access and compare the three most common procedures performed for hemorrhoidal disease by supervised residents at one institution.

METHODS

Were retrospectively analyzed patients who underwent surgical treatment for hemorrhoids from January 1995 to December 2007 in our institution. Residents supervised by assisting staff surgeons performed the procedures. Patients with grades III and IV hemorrhoids were included in the study with a follow-up period of at least 12 months. Patients that lost follow-up or with immune compromise, hematologic disturbances and previous anorectal procedures were excluded. Were also excluded patients who underwent more than one technique for hemorrhoidal repair at the same time.

Patients were divided into three groups, according to the technique used: group I: open technique (Milligan-Morgan), group II: closed technique (Ferguson) and group III: stapled hemorrhoidopexy (PPH).

During hemorrhoidectomy, piles were resected with cold scalpel and ligated with a 3-0 synthetic absorbable thread (polyglycolic acid or poliglecaprone). Closure of the wound in Ferguson's technique was performed with a 3-0 or 4-0 synthetic absorbable thread. During PPH, hemostatic stitches in the staple

line were necessary in the majority of the cases, being performed with 3-0 or 4-0 synthetic absorbable thread.

Collected data included operative time, intraoperative complications, early postoperative complications, length of hospital stay, and long-term morbidity. Recurrence was defined as the postoperative need of any procedure for the management of hemorrhoids symptoms (including band ligation).

All patients were preoperatively evaluated with a comprehensive history, physical examination and procto-sigmoidoscopy (colonoscopy when indicated). Patients also underwent surgical preparation, including an enema two hours before surgery and antibiotic prophylaxis at the anesthetic induction. Most patients underwent spinal anesthesia.

Statistical analysis was performed using unpaired t test, Chi-square test and one way Anova. All values are described in means \pm standard deviation, unless otherwise indicated. The Statistical Package for the Social Science (SPSS[®], Inc, Chicago, IL) was used for data analysis. A $p < 0.05$ was considered to be statistically significant.

RESULTS

There were 333 patients included in the study, 182 (54.6%) males and 151 (45.4%) females, with a mean age of 45.3 (\pm 12.02) years old. Grade III and IV hemorrhoids were present in 272 (81.7%) and 61 (19.3%) patients, respectively. The incidence of grade IV hemorrhoids was 16.4%, 24.3% and 14.7% for groups I, II and III, respectively. Most patients (87.4%) had two or more vascular enlargements visualized during anorectal examination.

Twenty patients (6%) were excluded from the long-term analysis due to loss of follow-up or lack of chart information. They were nine from group I, six from group II and five from group III. Mean follow-up period was 60 months (\pm 48, range 12-156) in group I, 56 months (\pm 41, range 12-145) in group II and 36 months (\pm 33, range 12-96 months) in group III. PPH patients were followed for a significantly shorter period compared to the other two groups ($p=0.0032$).

Groups I, II and III were comprised of 189 (57%), 87 (26%) and 57 (17%) patients, respectively. Mean operative time was 61.1 (\pm 26.5) min in group I, 67.1 (\pm 28.3) min in group II and 49.4 (\pm 29.3) min in group III. PPH technique had a significantly lower operative time when compared to the other techniques ($p=0.0034$). There was no significant intraoperative complication in any group. Postoperative rectal bleeding requiring surgical intervention occurred in one patient in group I and one in group II. No septic complications occurred. There was no significant difference among the groups regarding postoperative complications or reoperation rate. Mortality was null.

Length of stay was similar between groups, with

mean time (in days) for hospital discharge of 1.41 (\pm 0,86; range 1-6) in group I; 1.19 (\pm 0,43; range 1-3) in group II and 1.16 (\pm 0,37; range 1-2) in group III. Considering only patients that stayed less than two days in the hospital a significant difference was observed favoring both Ferguson and PPH groups, when compared to Milligan-Morgan (p = 0.018 and 0.0058, respectively).

Considering a minimum follow-up of 12 months, the incidence of fecal incontinence was extremely low (0.96%), and there were no statistical differences among groups.

Late reoperations for symptomatic recurrence were required for seven (3.7%) patients in group I, two (2.3%) in group II and 1 (1.75%) in group III. The proportion of grade III and IV hemorrhoids that recurred was overall the same. Postoperative band ligation was necessary in one (1.14%) patient who underwent Ferguson's technique and three (5.25%) patients in the PPH group. Two patients required anal dilatation due to anal substenosis (one in the Milligan-Morgan group and one in the PPH group)

DISCUSSION

The three most commonly performed and taught procedures for the management of hemorrhoidal disease are Milligan-Morgan hemorrhoidectomy, Ferguson hemorrhoidectomy and stapled hemorrhoidopexy (PPH). Extensive data exists about these techniques, but a paucity of studies report their results when performed by residents under training, persisting the doubt if they can achieve similar results to the ones reported in the literature.

Considering immediate postoperative bleeding, its reported incidence is similar between conventional hemorrhoidectomy and PPH (0.4 to 10% and 0 to 9.6%, respectively)^{19,22,26}. In the present study, a similar incidence of rectal bleeding was also observed for the three techniques (3.7%, 2.3% and 3.5% in groups I, II and III, respectively). It is important to point that for all PPH cases a systematic revision of the stapled line was always performed, with hemostatic stitches when needed. Mention must also be made to the fact that only hemorrhages occurring in the first week were considered, since some authors report a higher incidence of late bleeding, between the 1st and 2nd postoperative weeks following conventional hemorrhoidectomy when compared to PPH (33.3% vs. 17.9%)^{11,19,22,26}.

Since its development, PPH showed shorter operative times when compared to conventional techniques^{11,13,25}. A recent meta-analysis of 25 randomized controlled trials observed a significant difference of 11.35 min, favoring the PPH²⁷. A similar finding (11.42 min) was observed in a meta-analysis of 29 randomized controlled trials, with nine studies reporting operative time²⁵. In the present study, was

observed that residents in training also perform PPH quicker than the other two techniques (mean of 14.7 min faster, p =0.0034). Comparing only the two conventional procedures Ferguson was, as expected, longer to perform, but the 7 min difference was not statistically significant (p =0.12).

Another supposed advantage of PPH is the briefer length of hospital stay. A recent meta-analysis confirmed this, observing a difference of 1.07 days favoring PPH²⁷. This is in accordance with the findings of eight randomized controlled trials that compared PPH with conventional hemorrhoidectomy²⁵. At the present report, length of hospital stay was comparable among the three groups, but Ferguson and PPH groups had a significantly higher number of patients discharged in two days or less.

Although uncommon, fecal incontinence is the most feared complication following anorectal procedures. The exact frequency of this event is unknown and many series do not address this matter. Recently, Shao et al.²⁵ observed that only six of 29 studies comparing conventional and stapled techniques analyzed the incidence of incontinence. The authors did not notice any significant difference between stapled and conventional techniques. Giordano et al.⁹ in a meta-analysis of 15 randomized controlled trials with at least 12 months follow-up observed a comparable incidence of fecal incontinence for patients undergoing either conventional or stapled procedures. There is only one study demonstrating a statistically significant difference, favoring the stapled technique⁸. In the current study, there were three cases of fecal incontinence totalizing 1.4%, which means that properly guided residents can perform the techniques safely, with minimal damage to the anal sphincters. All incontinence symptoms were relatively mild and occurred in female patients. They were all referred to biofeedback therapy with acceptable improvement.

Symptoms recurrence after surgical treatment of hemorrhoidal disease occurs in approximately 5% of the cases^{4,11}. Controversy exists if PPH have a higher incidence of recurrence when compared to hemorrhoidectomies^{3,5,7,8,9,12,14,18,20,21,23,24,28}. The meta-analysis by Shao et al.²⁵ demonstrated a relative risk for recurrence after PPH of 2.29 when compared to hemorrhoidectomy. In addition, at the beginning, stapled hemorrhoidopexy was considered a better indication for grade IV hemorrhoids but evidence now points the other way. In fact, grade IV hemorrhoids have a higher symptomatic recurrence following PPH when compared to conventional surgery. Zacharakis et al.²⁸ reported hemorrhoidal disease recurrence in 58.9% patients with grade IV hemorrhoids after PPH in a median follow-up of six years. Postoperative hemorrhoidectomies were required in 42.8% of these patients. In the present study, 9 of 61 grade IV hemorrhoids were repaired by PPH, and in a median follow-up of 36 months only one band ligation was

needed for symptomatic recurrence. This result should be considered in the following context: most PPHs were performed to grade III hemorrhoids, patient's selection was not random and the follow-up is relatively short.

Concerning other possible complications following surgery such as severe pain, chronic proctalgia, painful evacuation and submucosal abscess, none of these

TABLE 1 - PPH vs. conventional techniques: long-term complications

Author	N	Anal stenosis	Skin tags	Symptom recurrence
Cheethan ⁴	PPH:15	NR	NR	PPH: 2
	Cnv:16			CNV: 1
Kairalouma ¹⁵	PPH: 30	PPH: 1	PPH: 11	PPH: 5
	Cnv: 30	CNV: 1	CNV: 12	CNV: 0 a
Ortiz ²⁰	PPH: 27	PPH: 0	PPH: 7	PPH: 7
	Cnv: 28	CNV: 0	CNV: 7	CNV: 0 a
Ho ¹²	PPH: 57	PPH: 5	PPH: 2	NR
	Cnv: 62	CNV: 5	CNV: 2	
Brown ³	PPH: 15	PPH: 1	NR	NR
	Cnv: 15	CNV: 1		
Present study	PPH: 57	PPH: 1	PPH: 2	PPH: 3
	Cnv: 276	CNV: 1	CNV: 20	CNV: 20

PPH- Procedure for prolapse and hemorrhoids (stapled technique); Cnv- conventional (open and closed); a statistically significant

events was observed in this study. Table 1 presents long-term complications observed in different studies.

The present study have some limitations mainly due to the retrospective analysis of the techniques. For instance, operative blood loss, postoperative pain and the incidence of urinary retention could not be addressed. The selection of patients was not based on randomization, which could be a bias favoring the long-term results of the PPH group. In addition, the shorter follow-up period of the stapled group could be one of the factors related to the low incidence of long-term complications (including recurrence) in this group of patients. Regardless these facts, the current results support the efficacy and safety of the used techniques. It is also remarkable that good short-term and long-term outcomes, comparable to those found in the literature, can be achieved by residents operating under direct supervision of staff surgeons.

CONCLUSIONS

Residents in training can perform Milligan-Morgan, Ferguson and PPH efficiently, with early and long-term results similar to those reported in the literature. Symptomatic recurrence, reoperation rates and band ligation usage were similar among groups (despite a shorter follow-up for the PPH group). PPH had a significantly lower operative time and Milligan-Morgan hemorrhoidectomy a higher number of patients staying in hospital for more than two days.

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