

PPH vs Milligan-Morgan: early and late complications in the treatment of haemorrhoidal disease with circumferential prolapse



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PPH vs Mulligan-Morgan: early and late complications in the treatment of haemorrhoidal disease

BACKGROUND: *The aim of this study was to assess the early and late complications of haemorrhoidectomy according to Milligan-Morgan (Milligan-Morgan laser optical fibers variant) vs haemorrhoidopexy with PPH-stapler and to assess the long-term results in terms of recurrences in circumferential prolapse patients classified P4-E4 (PATE 2000).*

METHODS: *Onehundredsixty patients, with haemorrhoidal disease classified P4-E4, who underwent surgery between 2001 and 2007, were included in an retrospective observational study. Group A (M-M laser fibre) 80 patients (50%) (50 Male, 30 Female; median age 39 years, range 23-57 years). Group B (PPH-Stapler) 80 patients (50%) (58 Male, 22 Female; median age 40 years, range 23-60 years).*

RESULT: *Early complications were thrombosis (6 cases in M-M vs 1 in PPH) and urinary retention (13 M-M vs 5 PPH). There weren't cases of sepsis. Late complications have been: occasional bleeding 13.5 % in the M-M-group vs 10 % in the PPH-group; defecatory urgency 2.5 % (M-M-group) vs 5% (PPH-group) with $p < 0.1$; persistent pain 2.5 % (M-M) vs 5 % (PPH) with $p < 0.1$; soiling 18.75 % (M-M) vs 0 % (PPH) with $p < 0.001$; recurrences 5 % in PPH-group vs 0 % in M-M ($p < 0.05$); residual disease 7.5 % in M-M-group vs 0 % in PPH $p < 0.01$.*

CONCLUSIONS: *PPH-stapler procedure for treatment of haemorrhoidal prolapse is an important improvement, but may be followed by severe complications. We think that it has a clear indication in the treatment of haemorrhoidary disease with circumferential prolapse classified P4-E4.*

KEY WORDS: Haemorrhoidopexy, Haemorrhoidectomy, Laser Fiber, PATE 2000 Classification.

Introduction

Haemorrhoidal disease is the most frequent and ancient proctological pathology. Hemorrhoidectomy is always feared for intensive post-operative pain and complications^{1,2}.

Surgical techniques have advanced more and more with the aim of reducing the post-surgical pain and to help a faster recovery. "Open hemorrhoidectomy", according to Milligan-Morgan procedure, has been the most used method in Europe, also in the "Ligasure" and "Ultracision" variant. "Closed hemorrhoidectomy", according to Ferguson procedure, has been the most used method in the USA. Stapled hemorrhoidopexy (PPH-stapler) is an alternative method to conventional surgical procedures. It has many advantages such as less pain, faster recovery and a quicker return to normal activities. Over the last few years, the scientific debate was concentrated on the comparison between M-M vs PPH in order to early and late complications. The supporters of

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TABLE I - PATA 2000 Classification.

P (Internal Prolapse)	0 Not prolapsed hemorrhoids 1 Single node prolapse 2 Double node prolapse 3 Triple node prolapse 4 Circumferential prolapse
A (Acute Events)	0 No acute events 1 Bleeding 2 Edema 3 Thrombosis
T (Sphincter Tone)	-0 Sphincter hypotonia 0 Sphincter normotono +0 Sphincter hypertonia
E (external prolapse)	0 No external hemorrhoids 1 Single node 2 Double node 3 Triple node 4 Circumferential prolapse

TABLE II - Uniformity of the groups with chi-square test

	Group A	Group B	χ^2
Surgical techniques	M-M laser fibre	PPH	
Patient operated	n° 80	n°80	n.s
Sex	50 M; 30 F	58 M; 22 F	n.s. (1,823)
Age (Mediana)	39 (r.23-57)	40(r.23-60)	n.s.
Classification	Pate 2000:P ₄ -E ₄	Pate 2000:P ₄ -E ₄	n.s.

TABLE III - Symptoms associated to haemorrhoidal prolapse before surgery

1) Constipation	90	56.25 %
2) Pain	30	18.75 %
3) Thrombosi	20	12.50 %
4) Ematochezia	80	50.00 %
5) Anal Itch	50	31.25 %

M-M technique stressed the possibility of serious complications after PPH (haemorrhage, sepsis, colostomy), whereas the supporters of PPH technique stressed the intense and persistent post-surgical pain of the M-M technique, especially after defecation, and the contraindication for a circumferential prolapse. The aim of this study was to assess the early and late complications of haemorrhoidectomy according to M-M (laser variant with optical fiber) versus haemorrhoidopexy with PPH-stapler in patients with circumferential mucohaemorrhoidary prolapse P4-E4 according to PATE 2000 Classification (Table I) and to assess the long-term results in terms of recurrences and complications³⁻⁸

Materials and Methods

We retrospectively analysed the data from 160 patients with circumferential prolapse classified P4-E4 according to PATE 2000 classification (reducible sec. Goligher) who underwent surgery between 2001 and 2007, and were included in an retrospective observational study. Group A (Milligan-Morgan laser optical fibers) 80 patients (50%) (50 Male, 30 Female; median age 39 years, range 23-57 years). Group B (PPH-Stapler) 80 patients (50%) (58 Male, 22 Female; median age 40 years, range 23-60 years) and we compare the uniformity of the groups with chi-square test (Table II). Study was notified to the Ethics Committee of our "Mater Domini" University Hospital. All patients underwent anorectal manometry and were selected according to normality of the sphincter tone. Furthermore the patients underwent sigmoidoscopy. In the M-M group, the additional nodules, which were not

removed for technical requirements (to preserve mucocutaneous bridges), were considered "residual of disease". Similarly, in the PPH group, the excess of rectal mucosal prolapse over the PPH-stapler resection capacity was considered as "residual disease". We used the Diomed 60 watt, with conical optic fibre, and PPH suture 01 and 03 and the symptoms associated to haemorrhoidal prolapse before surgery are reported (Table III). The pain's scale connected to the choose of surgery was calculated with Verbal Numeric Scale, every 24 hours (with a questionnaire compiled by the patient), and with analgesic's administrations in 24 hours (Ketorolac 30 mg), extracting (sec. A. Wiel Marin - Integrated Columbus Complex-Roma) a significant scheme:

V.N.S. (0-2) null pain-> 0 administration;
V.N.S.(2-4) modest pain-> 1administration;
V.N.S.(4-7) intense pain-> 2 administration;
V.N.S. (7-10) unbearable pain-> 3 or + administration. The patients underwent to periodic controls for a period of 1 year (7 days, 30 days, 3 months, 6 months, 1 year).

Follow-up of patients was performed by surgeons of our team and no patients were lost.

In the study, "t-test" was used to compare pain scores and "chi-square" test for the complications.

Results

The results of the average V.N.S. values for every patient and distributed by time and the relative statistical comparison is reported in Table IV.

The results of early and late complications after surgery are reported in Table V.

TABLE IV - Results of the average V.N.S value for every patient and for series of hours with statistic comparison

Hours	0-24	24-48	48-72	4° day	5° day	6° day	7° day
M-Mlaser	6.50	6.00	6.00	5.00	4.50	4.00	4.00
PPH	4.70	2.30	1.30	1.30	1.30	1.30	1.00

with $p < 0,0117$, significant for $p < 0,05$ until 72° hour
with $p < 0,0001$, significant for $p < 0,01$ until 7° day

Table II shows the homogeneity of the two groups. The numeric description of Table 4 shows that the average values V.N.S. were clearly inferior in the PPH group. This observation is confirmed by statistic comparison ("t-test"), that executed for the beginning 72 hours, showed a level of significativity of $p < 0.0117$, whereas the estimate extended at the beginning seven days, showed a level of significativity more resolute, $p < 0.0001$. The data in the Table V show that the early bleeding was more present in the M-M group (5 cases vs 2), even if the differences was not statistically significant. Instead, among the early complications, the results of thrombosis and urinary retention were very interesting both significantly more frequent in the M-M group (thrombosis: 6 cases in M-M vs 1 in PPH; $p < 0.05$; urinary retention: 13 vs 5; $p < 0.05$; chi square = 4.006). There weren't cases of sepsis. In Table VI, late complications are reported: although the occasional bleeding engraved 22 cases altogether (13.75%) and this was the most frequent complication, nevertheless, between the groups there wasn't statistical difference ($p > 0.1$). Similarly, there was not statistical difference between the groups in the following complications: defecatory urgency, stenosis, gas and faeces incontinence 0 cases. Persistent pain was observed in 10 cases M-M and 4

cases in the PPH group with $p < 0.1$; also anal fissure was significantly more frequent in the M-M group. The soiling was present only in the M-M group, with 15 cases (18.75 %) (vs 0 cases in the PPH). Relapses were present only in the PPH group: 4 vs 0; among these, only one patient underwent a second surgery and was not considered further in this study. Residual disease was present only in the M-M group (6 patients); all patients were surgically treated and not further considered in the study. We did not observe any case of prolapse during follow-up in both groups. The power of our study is 0.3, calculated on V.N.S. values up to 72h.

Conclusions

The results of our study showed that PPH group was associated with less post-operative pain compared with M-M group; this was evident at 24 hours, but the most important datum was that in the PPH group, the patients had not or minimal pain after the third post-operative day (mean V.N.S. = 1.30); while in the M-M group many patients used analgesics up to 7th day (mean V.N.S. = 4.00).

The few cases of immediate post-operative bleeding were treated in the M-M group, with conservative therapy according to Pescatori⁹. Two cases of severe haemorrhage in the PPH-group, were treated in the operating room. We performed reconstruction of the muco-mucosal anastomosis with manual overstitching (Vicryl 2/0) for complete tissue laceration along circular suture line. Besides, we removed a large number of crumbled clips. Our percentage (2.5%), inferior to the other studies, was probably due to use, since 2004, of PPH03, that offers a better haemostatic performance^{10,11}. Thrombosis in the M-M-group was caused by the presence of "residual disease" that were left in order to respect the muco-cuta-

TABLES V - Results of early and late complications after surgery

	M-M laser	%	PPH	%	X ²	%
Bleeding	5	6.25%	2	2.50%	2.770	<10%
Urinary retention	13	16.25%	5	6.25%	4.006	<5%
Thrombosis	6	7.50%	1	2.50%	3.734	5%
Sepsis	0		0			
Occasional bleeding	14	17.50%	8	10.00%	1.897	>10%
Defecatory urgency	2	2.50%	4	5.00%	0,692	n.s
Persistent pain	10	2.50%	4	5.00%	2,818	< 10
Anal fissure	4	5.00%	1	2.50%	2,529	< 10
Soiling	15	18.75%	0	0	16,55	< 1
Stenosis	0		0	0		n.s
Recurrences	0	0	4	5.00%	4,102	< 5
Residual of disease	6	7.50%	0	0	6,233	< 1
Gas Incontinence	0		0			n.s
Feces Incontinence	0		0			n.s

Median follow-up 54 months (r.12-84) for PPH.

neous bridges and to avoid the risk of anal stenosis even if we did the liberation and cleaning up according to Arnous¹². The urinary retention with 16.25 % in the M-M group, was treated by bladder's catheterization. This problem is not secondary in expectation of to perform surgical treatment in day-surgery. The important statistic difference between the two groups (considering that the "saddle" anaesthesiologist method used reduce considerably the cases of urinary retention in comparison with the spinal method) was connected with painful manoeuvre to perineum, more evident with M-M technique¹³.

In late complications (after the third post-surgical week), the occasional bleeding in M-M was attributed to the transit of dried faeces, to a non correct use of laxatives, or to problems of cicatrization of the anal wound. In the PPH group, the laceration of the rectal mucosa was well documented. The mucosal damage was caused by clips during tissutal elimination (ambulatorial removal). Occasional bleeding may be also sign of no specific proctitis.

The persistence of metallic clips and the excessive depth of suture purse-string, seemed responsible of the feeling of "imminent defecation" that may have been the cause of "urgency defecation" and persistent pain in the PPH group¹⁴. It is fundamental to prepare the purse-string not inferior to 4 cm from toothed line (with anastomosis no minus of 2 cm) to avoid some complications like the persistence of strong postoperative pain, or incontinence due to the sphincteric deterioration, that may have been involved in the suture. In fact, it might be mainly related to a fibrosis around the staples or a direct trauma from the staples that triggers the pudendal and sacral nerve spindles located at the level of the puborectalis muscle as recently shown by De Nardi et al.¹⁵ and reported by Khubchandani et al.¹⁶.

To verify the correct distance of the suture, it is always necessary a histological exam of the surgical material, because the presence of squamous and transitional epithelium in the sample gives demonstration of too low suture line. The depth of suture clips has its own importance too: the surgeons who published¹⁴ histological results regarding the presence of smooth muscular fibres of rectum in the cylinder removed, showed that in case of apposition of metallic clips fell close the nervous net that covers the pubo-rectal muscle and the elevator muscles and the patient had a defecatory urgency¹⁴. Furthermore the presence of muscular fibres in the mucous cylinder removed, may be cause of chronic pain or also moderate incontinence. The problem, nevertheless, remains controversial; in fact, different authors¹⁷ reported cases of patients operated by PPH that showed muscular fibres in the mucous cylinder removed without pain or alteration of ano-rectal function. The persistent pain in the M-M group (for about one hour after defecation and treated with use of analgesics) was attributed to temporary spasm of the anal sphincter for slow cicatrization of

anal wounds, or was connected to infection of open wounds. The anal fissure was the result of inadequate healing, probably for high sphincter tone after surgery¹⁸; however in the cases of M-M the anal fissures were in the posterior commissure and were cured for 40 days with nifedipine local cream. In the PPH, group the anal fissure was observed on the anterior commissure and, with the same medical therapy for M-M group, healed more quickly. The soiling was reported only in the M-M group probably for the loss of sensibility caused to removal of epithelium of anal canal or for the anatomic loss of haemorrhoidal bearings that contribute to continence. The symptom, that engraved negatively on the patients quality of life lasted about 3 months. In the circumferential prolapse, the Milligan-Morgan-technique did not corrected totally the anatomic damage for persistence of residual nodules, which were not removed to preserve muco-cutaneous "bridges"; in six cases the "residual disease" turned symptomatic and was necessary new surgical treatment to remove the residual nodules. The definition of the "recurrence" has not the same meaning for the two groups (PPH and M-M); as regards the cases occurred in the PPH group (median follow-up = 54 months) it is necessary to do some considerations: 1) in all patients the stage of disease improved anyway in the anatomic situation (reduced to the stage P1E1-P2E2), with absence of symptoms in 3 patients. In case of new surgical treatment, we observed, inspecting the ring of removal, a partial subsiding of the purse string in a quadrant, probably due to technical mistake; 2) all patients continued to have frequent episodes of constipation due to inadequate observance of therapeutic recommendations; 3) all patients had a prolapse of 2.5 cm from anal margin.

This condition increased the risk of recurrence. Our percentage of recurrence (5 %) is in disagreement with some literature data: Ortis et al. reported rates of 53 % with 12 months of median follow-up¹⁷; Zacharakis et al.¹⁹ 58 % with 90.9 % symptomatic and 42.8 % retreated by M-M. We think this disparity may be attributed to a confused classification; in fact, the 4° grade of Goligher does not agree to circumferential prolapse of PATE classification. The irreducible haemorrhoids (4°), included in those studies, could increase erroneously the percentages of recurrence with PPH technique, whereas the haemorrhoidal disease, that needs surgical treatment, is represented for 95 % to prolapses of double, triple nodule and circumferential prolapses, but reducible.

PPH-stapler procedure for treatment of haemorrhoidal prolapse is an important improvement, but may be followed by severe complications. We think that it has a clear indication in the treatment of haemorrhoidal disease with circumferential prolapse P4E4. In this stage, PPH technique offers the best advantages in the control of postoperative pain, with a good comfort, a faster recovery and quicker return to normal activities.

There are still some problems to assess: 1) the long-term recurrences for the presence still, in the several studies, of haemorrhoidal disease classified as 4° degree; this classification is not more relevant on the basis to physiopathology knowledge and to technical progress; 2) the constipation before surgery, which if occurs, should suggest a different approach; or persistent constipation after surgery, which if it occurs, could increase the recurrences in the PPH-stapler procedure; 3) the presence of prolapse within 2.5 cm to marginal anal increases the risk of "residual disease" potentially symptomatic.

We advise against the PPH-technique in the irreducible haemorrhoidary disease (4° degree sec. Goligher), prolapses for excessive fibrosis, in the ulcerated suspected haemorrhoids or in the patients subjected to rectal anterior resection for cancer²⁰⁻²².

Riassunto

In questo studio osservazionale retrospettivo abbiamo confrontato le complicanze post-operatorie tardive e precoci di pazienti affetti da malattia emorroidaria con prolasso circonfrenziale (P4-E4 secondo la classificazione PATE 2000) sottoposti ad intervento chirurgico con tecnica Milligan-Morgan (variante laser a fibre ottiche) e con tecnica PPH-Stapler.

Nello studio sono stati inclusi 160 pazienti sottoposti a trattamento chirurgico tra gli anni 2001 e 2007. Il gruppo A è composto da 80 pazienti (50 maschi; 30 femmine; età media di 39; range 23-57 anni) trattati con tecnica Milligan-Morgan (variante laser a fibre ottiche); il gruppo B composto da 80 pazienti (58 maschi; 22 femmine; età media di 40; range 23-60 anni) trattati con tecnica PPH-Stapler.

Le complicanze precoci sono state eventi trombotici (6 casi in M-M vs 1 in PPH) e ritenzione urinaria (13 M-M vs 5 PPH) senza casi di sepsi. Le complicanze tardive invece sono state: sanguinamento occasionale del 13.5 % nel gruppo M-M vs 10 % nel gruppo PPH; incontinenza alla defecazione 2.5 % (M-M-group) vs 5 % (PPH-group) con $p < 0.1$; dolore persistente 2.5 % (M-M) vs 5 % (PPH) con $p < 0.1$; soiling 18.75 % (M-M) vs 0 % (PPH) con $p < 0.001$; eventi ricorrenti 5 % nel gruppo PPH vs 0 % in M-M ($p < 0.05$); residuo di malattia 7.5 % nel gruppo M-M vs 0 % in PPH con $p < 0.01$.

In conclusione, dai nostri dati osservati, la tecnica PPH-Stapler risulta essere più indicata della tecnica Milligan-Morgan per il trattamento chirurgico del prolasso emorroidario nonostante possa essere seguita da gravi complicanze con una specifica indicazione però nella malattia emorroidaria con prolasso circonfrenziale tipo P4-E4. Nella malattia emorroidaria con uno o più noduli invece, crediamo sia più indicato un trattamento chirurgico con tecnica Milligan-Morgan (variante laser a fibre ottiche).

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