

Case Analysis

## Long- and Short-term Results of Stapled Hemorrhoidopexy

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### Key Words

Stapled hemorrhoidopexy

**Purpose.** This study aimed to compare the short- and long-term outcomes of stapled hemorrhoidopexy with the procedure for prolapsed hemorrhoids (PPH) and Milligan-Morgan hemorrhoidectomy (MMH).

**Methods.** This is a retrospective study of 340 consecutive patients diagnosed with hemorrhoids. 205 patients with grade III and grade IV hemorrhoids were included, 52 of whom underwent PPH and 153 underwent MMH. Pre- and post-operative data were recorded and long-term outcome was followed-up at the out-patient clinic and by phone interview.

**Results.** There was no pre-operative difference between the PPH and MMH groups. Post-operative pain and time to normal activities were less in the PPH group ( $p < 0.05$ ). The rate of skin tag one year after surgery and recurrence rates were also higher in the PPH group ( $p < 0.05$ ). Delayed wound healing and post-operative hemorrhage were higher in the MMH group ( $p < 0.05$ ). No significant difference in long-term satisfaction was noted between the two groups (80.8% vs. 77.7%).

**Conclusions.** PPH have many short-term benefits due to the nature of the procedure but has a higher recurrence rate than the MMH group. Further large scale studies on the long-term recurrence of hemorrhoids after PPH is needed. [*J Soc Colon Rectal Surgeon (Taiwan) 2008;19:16-21*]

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**M**illigan-Morgan hemorrhoidectomy (MMH) has been widely accepted as the main surgical treatment of hemorrhoids for a long history, but it is notorious for the level of post operative pain the patient must endure, coupled with a long recuperation period. Stapled hemorrhoidopexy was presented as a procedure for prolapsed hemorrhoids (PPH) in 1998 by Longo.<sup>1</sup> From the view points of lesser post operative pain and short recuperation period after PPH, it was later adapted for grade III and grade IV hemorrhoids gradually. However, PPH had several drawbacks and long-term sequelae after it remained unknown.<sup>2,3</sup> Therefore, the Milligan-Morgan hemorrhoidectomy (MMH) is still the most popular method for hemorrhoids.<sup>4</sup> This study com-

pared the short- and long-term outcomes of PPH and MMH.

### Materials and Methods

From December 2001 to January 2004, 340 patients were diagnosed with hemorrhoids in our hospital. Of these, 136 with symptomatic grade II hemorrhoids were excluded and 19 were lost to follow-up. A total of 205 patients with grade III and grade IV hemorrhoids were finally included in the study and retrospectively reviewed.

Because procedure for prolapsed hemorrhoids (PPH) is an elective surgery in our hospital, it was per-

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Received: July 12, 2007.

Accepted: April 28, 2008.

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formed on 52 patients at their own request based on their financial capability. The rest of the 153 patients underwent the Milligan-Morgan hemorrhoidectomy (MMH). Both procedures were well explained to the patients and written informed consent was obtained prior to surgery.

Following our institution's pre-operative preparation routine for hemorrhoidectomy, all of the patients had glycerin enema for bowel preparation one day before the scheduled operative day. For good exposure of the anal canal, all of the patients were placed in a jack-knife position. All of the hemorrhoidectomies were performed under general anesthesia due to possible discomfort caused by the surgical (jack-knife) position.

Post-operative pain was controlled with oral naproxen® 250 mg every eight hours as needed for pain and Magnesium oxide was given for stool softening. All of the patients were discharged one day after the operation if no complications were noted.

Pre-operative data were recorded and compared between the PPH and MMH groups, including age, gender, grade of hemorrhoid, tenderness, bleeding, skin tag, prolapse, soiling, and infection (Table 1). Follow-up was arranged at the out-patient clinic regularly in the first few weeks and by phone contact in the following months. Recurrence was defined as symptoms of recurrent local tenderness or bleeding with or without an anal protruding mass. If any recurrence was noted by the patient, detailed symptoms were investigated. If recurrence was strongly suspected, a return for follow-up of the anal status was advised.

Careful local examination was performed in the out-patient clinic to differentiate skin tag from recurrence. Other symptoms and results were recorded, in-

cluding following-up time, post-operative pain, time to normal life or work, post-operative anal hemorrhage, massive bleeding requiring a second operation, wound dehiscence or discharge, delayed wound healing, anal discharge, pruritus, urinary retention, sphincter damage, soiling, incontinence, skin tag, stricture, and recurrence rate (Table 2).

The Mann-Whitney and Fisher's Exact Tests were used to compare the two surgical groups in terms of continuous or ordinal variables. A *p* value < 0.05 was considered statistically-significant.

## Results

### Pre-operative patient data

The average age was  $47.35 \pm 12.95$  and  $50.12 \pm$

**Table 2. Post-operative results**

Patient	Pph <sup>#</sup>	MM <sup>§</sup>	<i>p</i> value
Immediate post-operative pain by VAS <sup>&amp;</sup> on day 1*	$5.1 \pm 2.3$	$6.9 \pm 2.6$	0.000
1-week*	$3.1 \pm 1.1$	$5.7 \pm 1.2$	0.000
3-week*	$1.1 \pm 0.2$	$4.2 \pm 1.3$	0.000
Time to normal life or work (day)*	$8.1 \pm 3.2$	$13.4 \pm 4.6$	0.000
Post operative hemorrhage*	7 (13.5%)	30 (19.6%)	0.406
Hemorrhage need to receive second intervention	1 (1.9%)	2 (1.3%)	1.000
Delayed wound healing	1 (1.9%)	9 (5.9%)	0.457
Wound dehiscence	0 (0%)	6 <sup>!</sup> (3.9%)	0.341
Anal discharge	15 (28.8%)	63 (41.2%)	0.137
Pruritus	18 (34.6%)	60 (39.2%)	0.622
Urinary retention	10 (19.2%)	33 (21.6%)	0.844
Sphincter damage	3 (5.7%)	0**	0.003
Soiling	14 (26.9%)	59 (38.6%)	0.179
Incontinence	0	0	1.000
Skin tag*	23 (44%)	24 (16%)	
One year	10 (19.2%)	2 (1.3%)	0.000
One year after	13 (25%)	22 (14.4%)	0.09
Stricture	1 (1.9%)	0	0.254
Total recurrence*	8 (15.4%)	5 (3.3%)	0.005
Time at recurrence(months)	$23.87 \pm 14.33$	$41.8 \pm 12.47$	0.083
Satisfaction rate (%)	42 (82.4%)	119 (77.8%)	0.557
Follow up time (month)	$57.88 \pm 9.29$	$59.11 \pm 8.06$	0.441

\**p* < 0.05; \*\*8 cases received lateral sphincterectomy;

<sup>#</sup>Procedure for prolapsed hemorrhoids; <sup>§</sup>Milligan-

Morgan hemorrhoidectomy; <sup>&</sup>Visual Analog Scales;

<sup>!</sup>one patient received a second operation 3 days later for uncontrolled bleeding.

**Table 1. Pre-operative data of the patients**

Patient	PPH	MM	<i>p</i> value
Age (year)	$47.35 \pm 12.95$	$50.12 \pm 13.21$	0.273
Gender			0.715
Male	40 (76.9%)	113 (73.2%)	
Female	12 (23.1%)	40 (26.8%)	
Grade of hemorrhoid			0.629
Grade III	31 (59.6%)	82 (53.6%)	
Grade IV	21 (40.4%)	71 (46.4%)	
Tenderness	18 (34.6%)	50 (32.0%)	0.865
Bleeding	38 (73.1%)	125 (74.5%)	0.856
Skin tag	43 (82.7%)	138 (90.2%)	0.209
Soiling	3 (5.8%)	13 (8.5%)	0.766
Infection	0	0	

13.21 years in the PPH and MMH groups, respectively. The male/female ratio was 40/12 and 113/40, respectively. There were 31 patients (59.6%) with grade III hemorrhoids in the PPH group and 84 (54.9%) in the MMH group. For Grade IV hemorrhoids, 21 patients (40.4%) were in the PPH group and 71 (46.4%) in the MMH group. No differences were noted between the two groups (Table 1).

### Pre-operative symptoms

Tenderness was noted in the 18 PPH patients (34.6%) and 49 MMH patients (32.0%). Thirty-eight PPH patients (73.1%) and 125 MMH patients (74.5%) experienced bleeding during defecation. Pre-operative skin tag was noted in 43 (82.7%) and 138 (90.2%) patients of the PPH and MMH groups, respectively. Three PPH patients (5.8%) experienced soiling sensation, which was experienced by 13 MMH patients (8.5%). There was no pre-operative infection noted in either group (Table 1) and no significant differences were noted in terms of pre-operative parameters.

### Short-term surgical results

Within one month of surgery, the pain was significantly less in the PPH group compared to the MMH group using the Visual Analogue Scale score. The immediate post-operative pain score on day one was  $5.1 \pm 2.3$  in the PPH group vs.  $6.9 \pm 2.6$  in the MMH group ( $p = 0.000$ ). The pain became less severe in both groups but the severity was more serious in the MMH group on week-1 and week-3 post-operatively ( $3.1 \pm 1.1$  vs.  $5.7 \pm 1.2$ ;  $p = 0.000$  and  $1.1 \pm 0.2$  vs.  $4.2 \pm 1.3$ ;  $p = 0.000$ ). The time to normal life or work was  $8.1 \pm 3.2$  days in the PPH group and  $13.4 \pm 4.6$  days in the MMH group ( $p = 0.000$ ) (Table 2).

### Short term complications

Short-term complications were recorded. Seven PPH patients (13.5%) and 30 MMH patients (19.6%) had post-operative anal hemorrhage. One PPH patient (1.9%) underwent a second operation one week after PPH and two (1.3%) had a second operation for bleeding after MMH. One patient (1.9%) in the PPH group and nine (5.9%) in the MMH group experienced delayed wound healing for more than six weeks. No wound dehiscence was noted in the PPH group but was present in six patients in the MMH group, with one re-

quiring a second operation to check the bleeding.

Acute urinary retention was noted in 10 patients (19.2%) in the PPH group compared to 33 patients (21.6%) in the MMH group. Three patients (5.7%) with sphincter damage were noted by pathology examination in the PPH group but none in the MMH group ( $p = 0.003$ ). Eight MMH patients (15.1%) received lateral shincterectomy during the operation (Table 2).

### Long term results

During follow-up, 18 PPH patients (34.6%) and 60 MMH patients (39.2%) experienced pruritus. Soiling sensation was noted in 14 (26.9%) and 59 (38.6%) patients from the PPH and MMH groups, respectively. No incontinence was noted in either group but skin tags were noted in both groups, which was significantly higher in the PPH group during follow-up (44% vs. 16%). Ten patients (19.2%) experienced skin tag within one year after receiving PPH and only 2 patients (1.3%) in the MMH group ( $p = 0.000$ ). One PPH patient had anal stricture (1.9%) and none in the MMH group.

The total recurrence rate was 15.4% (eight patients) in the PPH group compared to 3.3% (five patients) in the MMH group ( $p = 0.005$ ). The mean time to recurrence was  $23.87 \pm 14.33$  and  $41.8 \pm 12.47$  months in the PPH and MMH groups, respectively. Total follow-up time was  $57.88 \pm 9.29$  months in the PPH group and  $59.11 \pm 8.06$  months in MMH group. No significant difference in satisfaction was noted between the two groups (Table 2).

## Discussion

Procedure for prolapsed hemorrhoids (PPH) was first reported by Longo 1998.<sup>1</sup> This technique involves the trans-anal placement of a circular purse-string suture located 4 cm above the dentate line. A 33-mm stapling device is placed trans-anally, facilitating circumferential excision of the distal mucosa and a portion of the hemorrhoid tissue after fixation of the anoderm. Many of the benefits and drawbacks were discussed.

Immediate post-operative pain was less in PPH and was considered to be a function of the surgical technique. The purse-string should be place 4 cm

above dentate line because placing it distally could result in the resection of the anal squamous epithelium, leading to more post-operative pain<sup>5</sup> and a greater likelihood of anal sphincter injury.<sup>3,6-8</sup> Although post-PPH pain is considered to be visceral pain, PPH incurs significant somatic pain on the day of surgery despite rapid resolution of pain in the first post-operative day. The cause remains unclear.<sup>9</sup> Thus, this may be the obstacle for the wide adaptation of PPH as a day-case procedure. However, some series report that discharging the patient one day after surgery is possible.<sup>10,11</sup>

Pain from PPH resolves rapidly in the first few days. This may be the major reason why patients feel more satisfied with PPH than the Milligan-Morgan hemorrhoidectomy (MMH). During short-term follow-up, less pain on defecation and at rest has been reported in several studies<sup>2,9,12</sup>. Some series report that patients with PPH has a higher post-operative satisfaction rating than those with MMH.<sup>10,12,13</sup> However, in long-term follow-up, satisfaction not different between the two groups.<sup>14</sup>

Patients who undergo MMH experience more pain in the first two weeks that may last for more than four weeks post-operatively. Analgesics use is reported to be about 37.6% lower in PPH patients.<sup>15</sup> With less pain and faster recovery of bowel movement and normal bowel passage, PPH has been reported to have a faster functional recovery with shorter time off from work.<sup>8,16</sup>

In the short-term, post-operative hemorrhage, wound dehiscence, delayed wound healing, anal discharge and pruritus was less frequent in the PPH group. This was reported in several studies and our report showed similar results. However, some reports indicated that PPH has a higher incidence of urinary retention<sup>17,18</sup> and sphincter damage<sup>3,6</sup>. Our results showed anal sphincter damage in the PPH group from pathology results. However, no difference was noted in post-operative soiling although incontinence was noted.

In long-term follow-up, one anal stricture was noted in the PPH group. Repeated anal dilatation and laxative use was done at the out-patient clinic. No further surgery was performed.

Anal skin tag is more frequent in the PPH group. Several studies indicate a greater prevalence of skin tag and prolapse in the PPH group.<sup>2,19</sup> This may be an inherent difference of the two procedures. Long-term

skin tag is more common in the PPH group in our study. To some extent, some of our patients feel this to be an incompleteness of the surgery. During the immediate post-operative period or in long-term follow-up, anal skin tag is the major concern among PPH patients. Some consider skin tag as a symptom of recurrence. In contrast, anoplasty was routinely performed on MMH patients, together with excision of the skin tag, in our study. Patients feel more satisfied with "eradicating" the hemorrhoids in short- and long-term follow-up.

Recurrence rate was higher in the PPH group in some series. In some of our patients, tenderness with soft anal protruding mass during long-term follow-up was noted. Recurrent anal protruding soft mass was deemed as a progression of the hemorrhoids and skin tag alone was not considered as recurrence in our study. In the MMH group, the prevalence was not as high as in the PPH group. It was reported in some series that recurrence rate was higher in the first year of follow-up.<sup>3,11,20</sup> In our study, recurrence rate was still higher in the PPH group at 5-years of follow-up, most of which occurred around 3 years after the surgery. Nonetheless, this was not significant compared to that of MMH. One study indicated the height of PPH performed above dentate line correlated with recurrence of prolapse and pain. Correlation with the length of time for recurrence was not mentioned.

Although, it has been stated that PPH is a relative safe procedure for hemorrhoids,<sup>21,22</sup> severe surgical related complications were still noted from literatures. The severity of the surgical related complications varies from bleeding, thrombosis, urinary retention, wound dehiscence to major complications.<sup>23,24</sup> Some were also encountered in our study. Rectal perforation and recto-vaginal fistula are the most serious complications which may lead to disaster results.<sup>25-27</sup> Several reports discussed about the complications and suggested that the procedures should be carried out by experienced colorectal surgeons with great care. Most complications can be avoided only by respecting the rectal wall anatomy in the execution of the procedure.<sup>23</sup>

## Conclusions

PPH stapled hemorrhoidectomy has many short-term benefits, such as reduced pain and early return to



normal life or work. Recurrence seems to be more common and earlier in the PPH group than the MMH group. Further large-scale studies of long-term recurrence after PPH are warranted.

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## 病例分析

# 吻合器痔瘡手術之短期及長期結果

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**目的** 本實驗的主要目的是比較痔瘡手術中，使用 procedure for prolapsed hemorrhoids (PPH) 以及 Milligan-Morgan hemorrhoidectomy (MMH) 兩種術式的短期及長期的結果。

**方法** 這是一個回溯性研究，包括連續 340 位痔瘡病患。其中 205 位為罹患第三度或第四度痔瘡之病患。於這些病患中，52 位病患接受 PPH 手術，153 位病患接受 MMH 術式。其術前及術後的資料皆被記錄比較。病患術後長期結果皆以門診追蹤並電話聯絡方式追蹤。

**結果** 對於此實驗中接受 PPH 及 MMH 的病患，其術前資料比較並無顯著差異。但在接受 PPH 手術的病人中，其術後疼痛明顯較輕微；並且病患從接受手術後回到正常工作生活的時間明顯較短 ( $p < 0.05$ )；但在術後一年追蹤中，肛門口皮膚結節發生率以及痔瘡復發率明顯的較高 ( $p < 0.05$ )。在接受 MMH 術式之病患中，其術後傷口延遲癒合及術後嚴重出血明顯較多 ( $p < 0.05$ )。但對於長期痔瘡術後滿意度，兩組病患並無顯著差異 (80.8% vs. 77.7%)。

**結論** 由於 PPH 的術式與傳統的痔瘡手術有本質上的不同，使得接受此術式的病患，相對於接受 MMH 的病患較多的短期效益，但相對的亦有較高的復發率。對於長期痔瘡接受 PPH 手術之後的長期復發率，仍需要進一步大規模的研究。

**關鍵詞** 吻合器痔瘡手術。