



## Classical Milligan Morgan Hemorrhoidectomy versus its Modification: Higher Risk of Fistula and Mucosal Ectropion

Adil Shaker Al-Tamimi\*

Consultant Surgeon, Assistant Professor, General and Laparoscopic Surgery, Department of Surgery, College of Medicine, University of Al-Qadisiyah, Iraq

\*Corresponding e-mail: [adel.altamimi@qu.edu.iq](mailto:adel.altamimi@qu.edu.iq)

### ABSTRACT

**Aim:** Assessment of a modified procedure of hemorrhoidectomy in terms of some postoperative complications in comparison to the original Milligan-Morgan hemorrhoidectomy. **Methods:** Total 182 patients with primary hemorrhoids were enrolled in the study, in Diwaniya Teaching Hospital, Iraq. The patients were equally divided and managed by the standard Milligan-Morgan open hemorrhoidectomy and the intended modification of the original procedure with the primary aim of reducing some of post-operative complications by providing wound coverage using the ligated hemorrhoidal pedicle which is further fixed to the cut edge perianal skin. Four post-operative complications pain, bleeding, fistula, and mucosal ectropion were compared between both groups. **Results:** There were 170 males and 12 females with a ratio of 14.16:1. Pain scale was not statistically different in both groups, with majority of patients 77.5% complained from mild and moderate pain. Most patients (91.7%) have a mild or no postoperative bleeding, with no significant differences between the two procedures. The frequency of post-operative low anal fistula was significantly higher in the modified procedure (7.7%,  $p=0.014$ ). The development of post-operative mucosal ectropion was interestingly and significantly high (18.7%,  $p<0.00005$ ) in patient who were subjected to the modified hemorrhoidectomy as compared to the classical hemorrhoidectomy. **Conclusion:** Understanding of the detailed anatomy of the anorectum is a crucial step before attempting any form of hemorrhoidectomy, and any modification for the originally tested procedures should follow the principles of preservation of the vital anatomical structure and its relations. The modification in our study associated with high frequency of post-operative fistula and ectropion.

**Keywords:** Milligan-Morgan hemorrhoidectomy, Modification, Fistula, Ectropion

### INTRODUCTION

Hemorrhoidal disease is so common that, it may represent the fourth common outpatient gastrointestinal condition [1]. It has an approximate worldwide estimated prevalence of 4.4% [2,3]. Fifty eight percent of peoples older than 40 may harbor the condition [4]. Males and females are equally affected by the disease [5]. Hemorrhoids have been known from an ancient period, and topical treatment of hemorrhoids dated back to Egyptian papyri of 1700 BC has been documented. The first surgical treatment was described by Hippocrates 460 BC [6,7]. Although the term hemorrhoid traditionally refers to a disease process, it actually describes a normal anatomical and physiological structure related to the anal canal, which are important in maintaining continence. Hemorrhoids are vascular cushions, smooth muscles, and connective tissues, because some devoid the muscular component, it may be considered sinusoids rather than arteries or veins [8,9]. It became pathological when these cushions become enlarged, displaced, prolapsed, and give rise to symptoms. For practical purposes, the term hemorrhoids may be reserved to describe these "cushions" when become abnormal and cause symptoms [10,11]. Hemorrhoids cause symptoms in 44.74% of patients affected [12]. About 50% - 66% of people will suffer from hemorrhoids at some period in their life time [13,14]. Many patients present late in the course of the disease due to social embarrassment [11,15]. Approximately 5-10% of patients with hemorrhoids fail to cope with conservative measures for symptomatic relieve, and surgical hemorrhoidectomy become the preferred option [16].

Hemorrhoidectomy is considered the treatment of choice for the symptomatic 3rd or 4th degree hemorrhoids, and Milligan-Morgan's and Ferguson's technique are the most widely used techniques throughout the world. The

results of both procedures described as excellent, but post-operative pain was the main drawback [11,17-19]. The whiteheads hemorrhoidectomy, described in 1882 was devised to excise the displaced internal hemorrhoidal tissue circumferentially and to reposition the dentate line that is usually part of prolapsing hemorrhoid [20]. Although this technique enjoyed wide spread application, it was subsequently largely abandoned because high rate of mucosal ectropion and anal stricture [21,22]. However, the technique enjoyed renewal at some period with lower rate of stricture and ectropion [23,24]. Mixed hemorrhoidectomy technique (closed and open areas), used by experts in both closed and open techniques, in case of excess or absence of skin in the raw areas of hemorrhoidectomy. Using the open technique, the expert may close the wound to encourage healing; on the other hand, the expert using the closed technique may leave an open area due to some local shortage of anal/perianal skin and further will act as a drainage site [25-27]. Many modifications for these original operations was introduced and their results was compared with the original procedure, of these the one that gained acceptance and widely practiced in our country with different terms for example modified Milligan-Morgan operation, the modification entailed transfixation and ligation of pedicle of the dissected hemorrhoidal mass (as in the classical Milligan-Morgan hemorrhoidectomy), the ligated pedicle pulled down and approximated with the perianal cut skin edge with the same ligature suture, in a trial to cover the resulting raw area in order to minimize some post-operative complications like bleeding, post-operative pain with shorter healing time [28,29].

#### PATIENTS AND METHODS

From May 2009 to July 2012, 182 patients suffered from 3<sup>rd</sup> and 4<sup>th</sup> degree hemorrhoid in whom conservative measures have failed to relief symptoms, they were managed in Diwaniya Teaching Hospital, Iraq, and were randomized into two groups, the first group (control group) 91 patients subjected to the conventional Milligan-Morgan operation, the other group (study group) 91 patients were managed by other surgical teams by modified Milligan-Morgan operation. Patients with coexisting ano-rectal disorder like fissure, perianal sepsis, inflammatory bowel disease and anorectal cancer, and patients who had lost follow up were excluded. Each patient signed the informed consent about the type of surgery, risks and the planned follow up which were explained to all patients participating in the study.

Surgery was accomplished under general or spinal anesthesia, with the control group managed by the classical Milligan-Morgan in which the hemorrhoidectomy wounds were left open, with meticulous hemostasis, hemostatic jell foam cylinder inserted at the end of surgery. The study group were managed by other surgeons who are adopting the modification for the original Milligan-Morgan, in which the difference is that, after ligation and excision of the pedicle of the hemorrhoidal mass they used to pull the ligated stump of anorectal mucosal mass (including the dentate line) outside the anal verge which is further fixed to the cut edge of perianal wound no anal pack were used. Four parameters were addressed and compared, which are complications of hemorrhoid surgery, early post-operative pain, bleeding and late development of mucosal ectropion and fistula.

All patients were evaluated in the day of surgery, 1<sup>st</sup>, 2<sup>nd</sup> post-operative day, one week later, one, three and six months thereafter.

Data were analyzed using version 19 SPSS system. Chi square test was used for categorical variable, p-value less than 0.05 considered significant. An independent sample t-test was used to compare severity of post-operative pain and bleeding and p<0.05 was considered significant.

We compare four postoperative complications, post-operative pain and bleeding that the modification claimed to reduce. And the development of late ectropion and fistula which was found to be more frequent in the modified procedure.

The pain intensity was graded as: Grade 0: No pain, Grade 1: Mild pain, Grade 2: Moderate pain and Grade 3: Severe pain, according to the numeric rating scale (NRS) to assess the intensity of pain [30].

Bleeding was scored as no bleeding, mild bleeding, moderate and sever bleeding. Severe bleeding which require urgent surgical action and or blood transfusion, was not observed in both study groups, cases with moderate bleeding (obvious dribbling during defecation that stop spontaneously) were managed with local measures of lubricant and stool softeners. Mild bleeding only few drops or streak on the stool that cease after few days and require no further action.

## RESULTS

One hundred eighty-two patients were included in the study with 91 patients (Group A) managed by conventional Milligan-Morgan hemorrhoidectomy and other 91 patients (Group B) managed by modified Milligan-Morgan hemorrhoidectomy. There was 170 males and 12 females with a male/female ratio (14.16:1) with mean age of 32 years. Pain scale was not statistically different in both groups,  $p=0.510$  (Table 1).

**Table 1 Frequency distribution of patients according to pain severity and type of surgery**

Pain severity	Milligan-Morgan surgery		Modified Milligan-Morgan surgery		Total	
	No.	%	No.	%	No.	%
Mild	18	19.9	23	25.3	41	22.5
Moderate	52	57.1	48	52.7	100	55
Severe	21	23	20	22	41	22.5
Total	91	100	91	100	182	100

$P=0.510$  not significant

No significant statistical differences were observed with regard to post-operative bleeding,  $p=0.726$  (Table 2).

**Table 2 Frequency distribution of patients according to type of surgery and bleeding**

Bleeding	Milligan-Morgan surgery		Modified Milligan-Morgan surgery		Total	
	No.	%	No.	%	No.	%
No bleeding	40	44	42	46.15	82	45
Mild bleeding	43	47.2	42	46.15	85	46.7
Moderate bleeding	8	8.8	7	7.7	15	8.3
Total	91	100	91	100	182	100

$P=0.726$ , not significant

There was appreciable statistically significant difference for the development of post-operative low fistula in anus between patients who underwent the modified procedure and those who underwent the original procedure  $p=0.014$  (Table 3).

**Table 3 Frequency distribution of patients according to type of surgery and fistula**

Fistula	Milligan Morgan surgery		Modified Milligan Morgan surgery		Total	
	No.	%	No.	%	No.	%
negative	91	100	84	92.3	175	96.2
positive	0	0	7	7.7	7	3.8
Total	91	100	91	100	182	100

$P=0.014$ , significant

The development of ectropion showed an interestingly high frequency (17 patients) when the modified procedure was adopted,  $p<0.00005$  (highly significant) (Table 4).

**Table 4 Frequency distribution of patients according to type of surgery and ectropion**

Ectropion	Milligan Morgan surgery		Modified Milligan Morgan surgery		Total	
	No.	%	No.	%	No.	%
No Ectropion	91	100	74	81.3	165	90.7
Ectropion	0	0	17	18.7	17	9.3
Total	91	100	91	100	182	100

$P<0.0005$ , highly significant

## DISCUSSION

Post-operative complications following hemorrhoidectomy are numerous, occurring at variable intervals after surgery, pain and bleeding are troublesome early complications, and the advent of new producers of hemorrhoidectomy were primarily designed to minimize these complications with the respect to improve the outcome with shorter healing time and lowest recurrence rate and/or the rate of late complications [31-34]. However, subsequent randomized trials have not borne out the initial enthusiasm in reduction of pain with these technique [35,36].

There is no documented advantage in reduction of postoperative complications, reduced operative time and blood loss, make the use of energy devices as a popular alternative to traditional hemorrhoidectomy [37,38]. The classic comparison was between the two commonly used procedures open versus closed hemorrhoidectomy [39]. Although it should be not on the expenses of recurrence, strict adherence to the principles of preserving as much as possible of the anorectal anatomy specially the mucocutaneous bridges, the integrity and the position the dentate line, will greatly minimize the possibility of the remote and probably embarrassing complications like stenosis and ectropion. Although there are no gender differences in the incidence of hemorrhoids in most published series [5], this was not observed in our study, for simple reason is that, female patient in our society attend a gynecologist instead, due to social and religious reasons. In this series the rate of post-operative bleeding was not statistically different in both procedures. However, the rate and severity of bleeding of patients in the classical Milligan-Morgan procedure was comparable with other studies [40-42]. However, one of the large series 2,189 patients subjected to open hemorrhoidectomy, documented a sever bleeding rate of 1.9% [43]. Reviewing other series of randomized controlled trials and meta-analysis, revealed bleeding rate range from 0.4% to 31% with no respect to the severity [44-50]. Regarding post-operative pain results showed no statistical difference in both procedures. Furthermore, the pain score in the classical Milligan-Morgan procedure was not different from most studies [42]. Some controlled trials documented a significant pain in 5.4% - 76% of patients [44-51].

The development of post-operative fistula is one of the documented complications following surgery for hemorrhoids with incidence rate of 2% in the closed method (Ferguson) reported by Ganchrow, et al. a large series conducted on 2,038 patients [52]. However, the incidence was lower in other series Senagore, et al. and Khubchandani, et al. [53,54]. Candela, et al., reported perianal extra-sphincteric fistula in 3.84% of the cases treated with standard open hemorrhoidectomy [55]. Sielezneff, et al., reported an incidence of fistula in anus: 1.2%) in large series conducted on 1134 cases [56].

However, in this study, the rate of post-operative fistula was 7.7% in the modified procedure group which is significantly higher than the original Milligan-Morgan procedure group and higher rate than in any other study documented this complications, the most likely accepted explanation is that the mere simple approximation of the ligated hemorrhoidal mass to the cut edge of the anal skin without fixing it to the underlying anal tissue (internal sphincter) will create a tunnel between the ligated mass and the neighboring perianal wound, if persist and heal it would be a nidus for fistulous tract. In contrast in the classical Milligan-Morgan procedure the wound would be uncovered during the healing process and the development of fistula is less likely. Mucosal ectropion results from misalignment of the dentate line at the time of hemorrhoidectomy. The moist mucosa extending to or beyond the anal verge causes symptoms of wet anus, pruritus ani and skin irritation [57]. While the rate of post hemorrhoidectomy anal mucosal ectropion should be negligible after the standard Milligan-Morgan procedure and most other hemorrhoidectomy techniques, only few of the published series documented this complication especially those that is associated with greater disturbance of the anorectal anatomical structure specially integrity and position of the dentate line, Allegra document iatrogenic mucosal ectropion after the use of a circular stapler for hemorrhoidectomy. This technique involved excising the hemorrhoidal tissue just proximal to the dentate line [58]. However, ectropion or the so-called Whitehead deformity was frequently encountered after the Whitehead procedure with a rate of 2-12% [21-23,59,60].

However, Whitehead procedure underwent many modifications and in selected cases with 4th degree hemorrhoid with or without extensive thrombosis, it regains acceptance by some surgeon with minimal postoperative complications [23,61-64]. In the present study, the rate of postoperative mucosal ectropion following the modified procedure was significantly high (17 patients), as the modified procedure associated with significant misalignment of the dentate line of the excised quadrants (usually 3) in which the ligated hemorrhoidal pedicle (anorectal mucosa) will be pulled out and approximated to the cut age wound far away from the anal verge, this found to greatly enhance the development of ectropion. We found that the rate is directly proportional to the size of the external component of hemorrhoid excised as it need larger wound on the expense of the anal and perianal skin, and with this modification, on attempt to cover the hemorrhoidectomy wound the anorectal mucosa fixed far away from the anal verge, perhaps the probable explanation of this deformity.

#### CONCLUSION

Hemorrhoids are so common that many surgeons participate in its management. Most of the excisional procedures are associated with some postoperative complications, the frequency of which depend on the severity of hemorrhoids

itself and the technical aspects of the procedure. Furthermore, comprehensive conceptualization of the importance of the anorectal anatomical structures is vital before embarking on any modifications for hemorrhoidectomy with special respect to the position and integrity of the dentate line otherwise some unexpected complication might come into view.

#### DECLARATIONS

##### Conflict of Interest

The author has disclosed no potential conflicts of interest, financial or otherwise.

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