

## Ultrasonographic Assessment of Internal anal Sphincter Integrity post Open and Stapling Approaches for Haemorrhoids

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### ABSTRACT

*Haemorrhoids is a common colorectal disease. Worldwide Prevalence is estimated at 4.4% in the general population. The mainstay of treatment is surgery, Stapled haemorrhoidopexy is a growing technique. Trials shown that it is effective with the advantages of less pain, discharge, bleeding and an earlier return to work. However, some doubts regarding the anal sphincters injury is still present. **Patients and methods:** Thirty randomly selected patients, with 3<sup>rd</sup> degree haemorrhoids, were allocated into two groups; stapled haemorrhoidopexy group and open haemorrhoidectomy group. Preoperative and one-month post-operative, Transanal Three-dimensional ultrasonography was done for the assessment of the anal sphincter integrity. Continence assessment was done one and six months postoperatively by Wexner continence score. **Results:** There was no statistically significant difference in Wexner continence score for both groups one and six months postoperatively in term of continence. However there was a better recovery in stapled haemorrhoidopexy group after six month. On assessment of the internal anal sphincter, there was no statistically significant difference between pre and postoperative internal sphincter thickness among both open haemorrhoidectomy group (Mean±SD: 2.39±0.65 to 2.34±0.53mm) and stapled haemorrhoidopexy group (Mean ± SD: 2.61 ± 0.64 to 2.61± 0.64 mm).*

**Conclusion:** the present study showed that both procedures are safe effective surgical procedures for treatment of hemorrhoidectomy

### INTRODUCTION

Haemorrhoid disease is one of the most common colorectal complaints. The usual symptoms of internal haemorrhoids are bleeding, swelling, irritation of the skin around the anus, pain, prolapse and mucous discharge.<sup>(1)</sup> Prevalence of symptomatic hemorrhoids Worldwide is estimated at 4.4% in the general population.<sup>(2)</sup>

Prevention of haemorrhoids development is the best management as the disease one started it tends to be worse.<sup>(3)</sup> Despite the non-surgical approaches, still the mainstay of treatment is surgery.<sup>(4)</sup> Therefore, there are many efforts to develop new techniques with less pain and faster recovery.<sup>(4)</sup> Operative haemorrhoidectomies are reserved mainly for third- and fourth-degree hemorrhoids. Open hemorrhoidectomy (Milligan-Morgan method) is the most commonly used technique, but the most common complications are postoperative pain, discharge, itching, bleeding and acute urine retention.<sup>(5)</sup>

Stapled haemorrhoidopexy or Longo technique for prolapsed 3rd to 4th degree haemorrhoids has been adopted on wide scale among the colorectal surgeons.<sup>(6-9)</sup> Several randomized trials have shown that this technique is as effective as the conventional Milligan-Morgan operation with the advantages of less postoperative pain, discharge, bleeding and an earlier return to work.<sup>(10-13)</sup> However, some doubts regarding the risk of the anal sphincters injury is still present, which in turn may affect anal continence.<sup>(14)</sup> This injury may be attributed to the excessive anal dilatation during the introduction of the stapler device or by entrapment of a part of the internal anal sphincter (IAS) during stapling of the mucosal ring.<sup>(15)</sup>

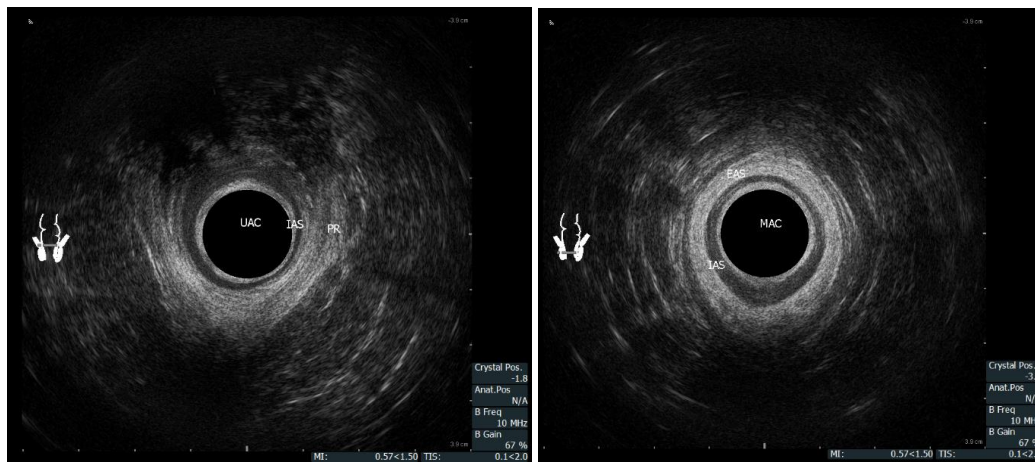
This prospective randomized study is to evaluate the ultrasonographic changes of the IAS thickness post stapled haemorrhoidopexy versus the conventional Milligan-Morgan operation, as well as assessment of post-operative anal continence changes.

## PATIENTS & METHODS

This is a prospective study that was conducted in Cairo University hospital (Colorectal surgery unit, Kasr Al Ainy). Thirty patients, with 3<sup>rd</sup> degree haemorrhoids, were randomly allocated into two groups using the closed enloperadomization technique. Group 1 was treated with stapled haemorrhoidopexy; and group 2 was treated with open Milligan-Morgan haemorrhoidectomy technique. All patients signed informed consent. Exclusion criteria included history of inflammatory bowel disease, previous anorectal surgery, impaired anal continence score and pregnant women.

All patients were subjected to complete medical history, routine preoperative laboratory

investigation and anal examination using anoscope. Preoperative and one month post-operative, Transanal Three-dimensional ultrasonography was performed using the (BK medical® Flex Focus 1202) for the assessment of the anal sphincter integrity. Anal enema was done one hour prior to examination, patient was examined in left Lateral position. Measurements for the internal anal sphincter were taken 3,6,9, and 12 O' clock at the level of mid and upper anal canal levels, Three-dimensional reconstruction was carried out after transverse and coronal plane scanning (Fig.1). Continence assessment using Wexner continence score was performed at one and six month postoperative. (Table.1) <sup>(16)</sup>



**Fig. (1):** Ultrasonographic appearance of upper anal canal (UAC) and Mid Anal canal (MAC) levels with anatomical appearance of the Puborectalis (PR), Internal and External Anal Sphincters (IAS) and (EAS).

**Table (1):** Wexner continence score<sup>(16)</sup>.

Type of incontinence	Frequency				
	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pad	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

Never, 0; rarely, <1/month; sometimes, <1/week, ≥1/month; usually, <1/day, ≥1/week; always, ≥1/day.

0, perfect; 20, complete incontinence.

## RESULTS

Both groups were matched regarding age and gender. Mean age was 42.07 years in open hemorrhoidectomy group versus 41.4 years in

stapled haemorrhoidopexy group with no statistically significant difference. (Table 2).

On assessment of continence using the Wexnar score there was no statistically significant difference between both groups at one and six months postoperative in comparison with the preoperative assesment (Table.3).

**Table 2:** Age and sex of the studied patients among both groups:

		Open hemorrhoidectomy (n=15)		Stapled hemorrhoidectomy (n=15)		p-value
Age (years)	25 - 45 - 62	8	53.33%	9	60%	0.7 (NS)
	45 - 62	7	46.67%	6	40%	
	Mean $\pm$ SD	42.07 $\pm$ 9.9		41.4 $\pm$ 12.2		
Gender	Male	12	80%	11	73.33%	0.7 (NS)
	Female	3	20%	4	26.67%	

NS: No statistically significant difference

**Table 3:** Wexner continence score of the studied patients among both groups:

		Open hemorrhoidectomy (n=15)		Stapled hemorrhoidectomy (n=15)		p - v a l u e
1 month post operative	Mean $\pm$ SD	1 . 8	$\pm$ 2 . 1	1 . 4	$\pm$ 0 . 8	0.5 (NS)
	R a n g e	0	- 7	0	- 3	
	M e d i a n	1		1		
6 months post operative	Mean $\pm$ SD	1 . 0 7	$\pm$ 1 . 9	0 . 7	$\pm$ 0 . 6 2	0.4 (NS)
	R a n g e	0	- 6	0	- 2	
	M e d i a n	0		1		

NS: No statistically significant difference

Among open haemorrhoidectomy group, Wexner continence score did not change significantly from 1 month postoperative to 6 months postoperatively. However, among stapled haemorrhoidopexy group, Wexner

continence score decreased with statistically significant difference from mean score of 1.4 at 1 month postoperative to 0.7 6 months postoperative. (Table.4) (Fig.2).

**Table 4:** Change of Wexner continence score from 1 month postoperative till 6 months postoperative among each group:

		Open hemorrhoidectomy (n=15)		Stapled hemorrhoidectomy (n=15)	
1 month postoperative continence score	Mean $\pm$ SD	1 . 8	$\pm$ 2 . 1	1 . 4	$\pm$ 0 . 8
	R a n g e	0	- 7	0	- 3
	M e d i a n	1		1	
6 months postoperative continence score	Mean $\pm$ SD	1 . 0 7	$\pm$ 1 . 9	0 . 7	$\pm$ 0 . 6 2
	R a n g e	0	- 6	0	- 2
	M e d i a n	0		1	
p - v a l u e		0 . 3 ( N S )		0 . 0 1 *	

\*Statistically significant difference

NS: No statistically significant difference

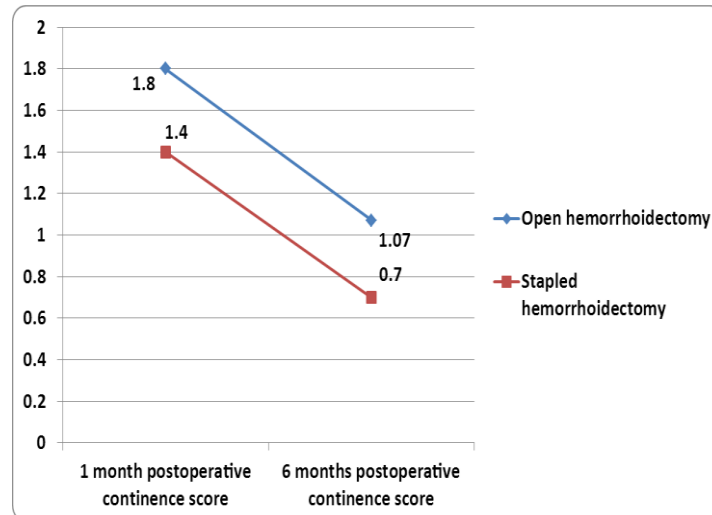


Fig.2: Wexner continence score of the studied patients among both groups:

Using transanal ultrasound there was no statistically significant difference between pre and postoperative internal sphincter thickness among both the open haemorrhoidectomy group (Mean ± SD: 2.39 ± 0.65 to 2.34± 0.53 mm) and stapledhaemorrhoidopexy group (Mean ± SD: 2.61 ± 0.64 to 2.61± 0.64 mm). (Table.5) (Fig.2)

Table 5: Preoperative and postoperative internal sphincter thickness among both groups:

		Open Group (N=15)	Stapling group (N=15)	P - Value
Preoperative internal anal sphincter thickness (mm)	Mean ± SD	2.39 ± 0.65	2.61 ± 0.64	0.4 (NS)
	Range	1.35 – 3.5	1.5 – 3.8	
	Median	2.1	2.5	
Postoperative internal anal sphincter thickness (mm)	Mean ± SD	2.34± 0.53	2.61± 0.64	0.2 (NS)
	Range	1.4 – 3.4	1.45 – 3.75	
	Median	2.1	2.45	

NS: No statistically significant difference.

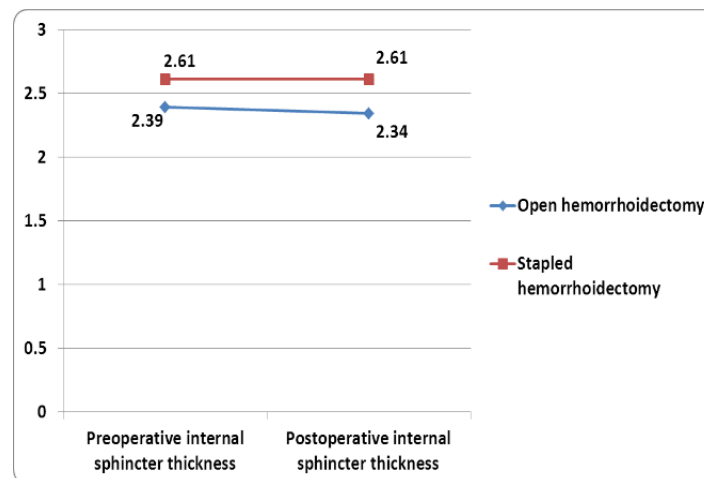


Fig. (3): Preoperative and postoperative internal sphincter thickness among both groups

## DISCUSSION

Hemorrhoidal disease is one of the most common anorectal disorders, affecting more than 15 million people annually in the United States<sup>(17)</sup>.

Conventional Miligan- Morgan surgical hemorrhoidectomy is considered the current "gold standard" for surgical management of hemorrhoids<sup>(18)</sup>, it involves excision of the hemorrhoids with ligation of their pedicles and is generally advocated for 3rd and 4th degree hemorrhoids<sup>(19)</sup>. This traditional approach is effective, despite its complications like significant pain, discharge, bleeding, and urinary retention<sup>(20)</sup>.

The treatment of external mucosal prolapse and hemorrhoids with a circular stapler was first described by Longo<sup>(21)</sup>, and since that time it has shown better outcome than the conventional method regarding less operative time, less postoperative pain and bleeding and shorter hospital stay<sup>(22)</sup>.

Although its early promising results further long term investigation regarding the anal sphincter function assessment using continence score and morphology assessment are still needed for proper assessment of the procedure effects.<sup>(14)</sup>

The aim of the present study was to establish the morphological changes of the anorectal sphincter after both the open and stapled haemorrhoidopexy technique, using the trans-anal ultrasound measurement of the internal anal sphincter, to ensure the safety of the stapled procedure on the anal sphincter thickness, and also assessing the post operative continence change between both techniques.

The present study showed that stapled hemorrhoidectomy had a better improvement of Wexner continence score six months postoperatively, while no significant change has been reported with open hemorrhoidectomy group.

There was no statistically significant change of internal anal sphincter thickness with no significant difference between both groups.

In a study done by Altomare, stapling procedure did not permanently damage the internal and external anal sphincters. Sphincter morphology (width and integrity) detected by three-dimensional ultrasonography remains

unchanged. In addition, clinical evaluation, using continence-scoring systems, showed an early temporary impairment noticed in some patients without long-term affection. They attributed the more continence affection in Miligan-Morgan approach is due to the direct surgery on the lower part of anal canal, that may cause internal anal sphincter injury specially when it is done with lateral sphincterotomy, also due to excision of the sensitive anal mucosa, in contrary to the stapling approach where the resected mucosal ring is 3-5 cm above the dentate line so it is done above the level of anal canal and no anal mucosal excision.<sup>(15)</sup>

In conclusion, the present study showed that both procedures are safe effective surgical procedures for treatment of hemorrhoid with slight better functional results achieved with stapled hemorrhoidectomy. With no significant change of the internal anal sphincter thickness and integrity between the two procedures

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