



## Stapled Hemorrhoidopexy in Egyptian Patients with Liver Cirrhosis: Initial Single Institution Experience

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### Abstract

**Introduction:** symptomatic internal hemorrhoids in liver cirrhosis patients in Egypt, with its associated bleeding diathesis, would favour a transanal-stapled hemorrhoidopexy precluding the need to excise either anoderm or perianal skin in those patients with potential advantages of reduction of operating time, postoperative pain, hospital stay and time to return to work. The aim of this work was to assess the efficacy, safety, pitfalls and the surgical outcome of stapled hemorrhoidopexy in liver cirrhosis patients in Egypt.

**Patients and Methods:** Thirty patients with symptomatic prolapsed hemorrhoids comorbid with liver cirrhosis who had intractable response to other non-surgical interventions underwent stapled hemorrhoidopexy. The efficacy outcomes measures were operative time, post-operative pain, analgesia requirement, and length of hospital stay, patient satisfaction and return to normal activities. The safety outcomes measures were post-operative bleeding, urinary retention, anal stenosis and sphincter damage.

**Results:** The average operative time was 27 min (range 20-45 min). Bleeding from the staple line after removal of the hemostatic gauze occurred in seven patients. VAS sore was  $\leq 3$  in 80% and 93.3% of patients at 1st and 2nd postoperative days respectively 73.3% of patients required two doses of parenteral analgesia (Ketolac<sup>®</sup>) in first postoperative day, which reduced to a single dose in 60% of patients in second postoperative day. Post-operative hospital stay was 2-4 days. Postoperative complications were urinary retention (10%), Minor delayed postoperative staple-line bleeding per rectum, which did not require any intervention, (46.7%) of patients. All patients received the procedure without symptom relapse except six of patients complained of prolapse of mass per rectum during defecation at 1 week -1<sup>st</sup> month (20%) both however, recovered and became symptom free at 3 months of follow-up. No patient reported incontinence to flatus or stool and none developed anal stenosis.

**Conclusion:** Stapled hemorrhoidopexy is a feasible and safe approach for prolapsed hemorrhoids concurrent with liver cirrhosis however; a larger scale controlled trials needed to support our results.

**Keywords:** Stapled hemorrhoidopexy; Liver cirrhosis; hemorrhoids

### OPEN ACCESS

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### Introduction

Although Excisional Hemorrhoidectomy (EH) remains the mainstay operation for advanced and/or complicated internal hemorrhoids, several minimally invasive operations such as Ligasure hemorrhoidectomy and Stapled Hemorrhoidopexy (SH) have been introduced into surgical practice with potential advantages of reduction of operating time, postoperative pain, hospital stay and time to return to work [1-3]. The frequently found symptomatic internal hemorrhoids in liver cirrhosis patients in Egypt, with its associated bleeding diathesis, would favour a transanal-stapled hemorrhoidopexy precluding the need to excise either anoderm or perianal skin in those patients [4-6]. The procedure could eliminate the obstacle of postoperative pain because the excision does not extend to the somatic innervation area as with excisional hemorrhoidectomy. Few reports have described this novel technique to treat severe hemorrhoidal bleeding or anorectal varices bleeding for patients with liver cirrhosis [6,7]. The aim of this work was to assess the efficacy, safety, pitfalls and the surgical outcome of stapled hemorrhoidopexy in liver cirrhosis patients in Egypt.

### Patients and Methods

During the period from April 2016 to January 2017, thirty patients with symptomatic prolapsed hemorrhoids comorbid with liver cirrhosis at Theodor Bilharz Research Institute enrolled in this

**Table 1:** Patient's demographics and preoperative data.

<b>Age mean and range (years)</b>	45.3 (35-67)
<b>Gender n-%</b>	
Male	19 (63.3%)
Female	11 (36.7%)
<b>Presentation n-%</b>	
Bleeding	17 (56.7%)
Concurrent bleeding, prolapse and pain	13 (43.3%)
<b>Hemorrhoids grade n-%</b>	
Grade III	9 (30%)
Grade IV	21 (70%)
<b>Child-Pugh-Turcotte (CPT) classification n-%</b>	
Class A	08(26.66%)
Class B	18 (60%)
Class C	04 (13.33%)
<b>Cirrhosis cause n-%</b>	
HBV	3 (10%)
HCV	25 (83.3%)
HBV + HCV	2 (6.7%)
<b>INR mean and range</b>	1.64 (1.3-2.3)

**Table 2:** Intra-operative data and Hospital stay.

Operative time (mean and range, minutes)	27 (20-45)
Staple line bleeding (n-%)	7 (23.3%)
<b>Hospital stays (n-%)</b>	
2 days	23 (76.7%)
3 days	6 (20%)
4 days	1 (3.3%)

study.

### Inclusion criteria

Include patients with circumferential hemorrhoids grade III and IV, who had intractable response to other non-surgical interventions and aged 18 years or older.

### Exclusion criteria

Include previous surgery for hemorrhoids, symptomatic incontinence, peri-anal sepsis, anal fissure, previous radiation of the immediate area and known inflammatory bowel disease. Patients with rectal and anal varices proved by preoperative colonoscopy excluded.

### Ethical approval

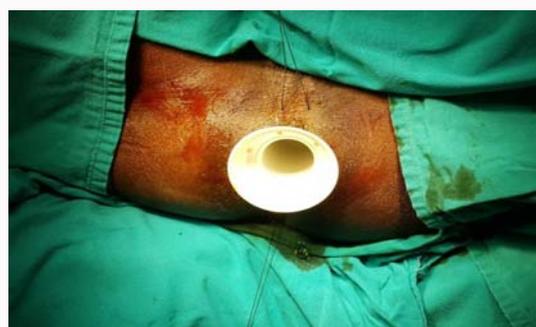
All of patients gave a written informed consent. The Ethical Committee of Theodore Bilharz Research Institute (TBRI) approved the study.

### Preoperative evaluation

All patients had classified according to Child-Pugh-Turcotte (CPT) classification. A detailed pre-operative local evaluation including Symptom scores of bleeding and prolapse, anal inspection during straining, digital rectal examination and anoscopy had done. Colonoscopy was carried out for all patients. Visual Analog Scale for recording post-operative pain was explained to all patients and co-operation sought in recording it (A score of 10 represents the worst



**Figure 1:** Covidien EEA™ Hemorrhoid and Prolapse Stapler Set 3.5 mm with DST Series™ Technology.



**Figure 2:** Application of anal dilator.



**Figure 3:** Suture port in place.

pain experienced, and 0 indicates no pain). Preoperative full bowel preparation with fleet enema and rectal wash out had done.

### Surgical technique

All procedures carried out with spinal anesthesia combined with local anesthesia under cover of peri-operative intravenous plasma infusion and ciprofloxacin and flagyl antibiotic administration. The patients had placed in lithotomy position and the surgical table adjusted at a height appropriate for the surgeon to sit during rectal suturing and standing during implementation of the stapler. All procedures were done using the Covidien EEA™ Hemorrhoid and Prolapse Stapler Set 3.5 mm with DST Series™ Technology (Figure 1). Anal dilator supplied with the set applied for 3-5 minutes then the suture port sutured into place (Figure 2 and 3). After which the anoscope of the set introduced for examination. With the suture port in place, a circumferential purse string suturing with no gaps between sutures, at 2 cm to 3 cm above the hemorrhoid pedicle the, approximately 4 cm from dentate line was carried out (Figure 4). The depth of the sutures was ensured not extend beyond the submucosal



Figure 4: Circumferential purse string suturing of the subucosal layer above the dentate line.



Figure 5: Anvil application and suture fixation.



Figure 6: Firing of the device.



Figure 7: Excised tissue after device removal.



Figure 8: Before the procedure.

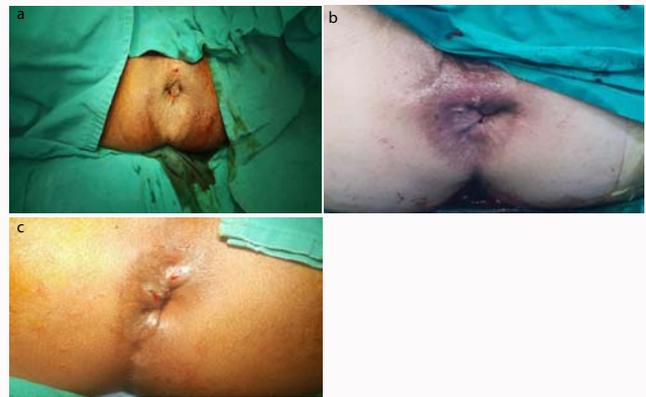


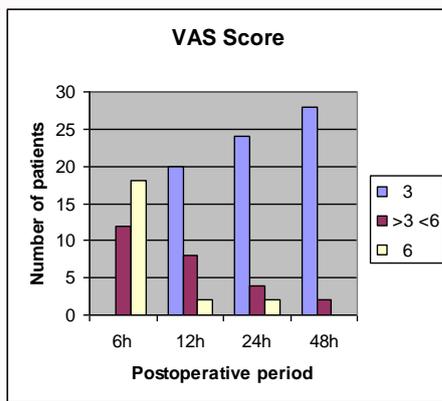
Figure 9: Immediate post-operative results.

layer. A careful manual and visual inspection of the purse string performed to assure the suture line is complete and not spiraled within the rectum. A surgical lubricant applied to the anvil prior to its insertion. The anvil inserted gently at an angle, its post then straightened within the canal when its head is past the purse string. In female patients, a digital and visual vaginal exam done to confirm the vagina is not involved in the sutured tissue. Gentle movement of the anvil during the manual exam helped to determine vaginal involvement. Prior to anchoring the anvil, the purse string inspected for location and accuracy of suturing. The purse string cinched prior to anchoring, and then anchored to the center rod by tying three or four tight square knots. Both ends of the suture line inserted, in opposite directions, through the center rod hole (the second hole on

the anvil post) that is proximal to the tissue to be removed (Figure 5). After attaching the anvil to the stapler, the device closed. Before firing the device, the surgeon was positioned appropriately for single-squeeze firing by shifting from a seated position (during suturing and insertion) to standing for firing the stapler (Figure 6). The device handle closed completely in one uninterrupted squeeze when the green color on the device indicator appeared. After firing, the stapler removed following one full turn of the black handle. After removal of the fired stapler, careful inspection of the stapled suture line was carried out and the sutures anchoring the suture port was then removed (Figure 7). Gauze with hemostatic agent (Surgicel® Original Absorbable Hemostat, ETHICON) was inserted in the anal canal and put in place for 5 min following removal of the device (Figure 8-10).



Figure 10: Three months post-operative.



Graph 1: Post-operative VAS scores.

**After surgery follow up**

Post-operative stool softening agent (oral magnesium oxide, 500 mg at night) and parenteral analgesia (Ketolac<sup>®</sup>) as required prescribed. Follow-up consisted of clinical follow-up at 1 week, 1 month and 3 months. Operative time, post-operative pain and analgesia requirement, hospital stay, return to normal activities and any post procedure complications within 3 months of the surgery recorded.

**Assessment criteria**

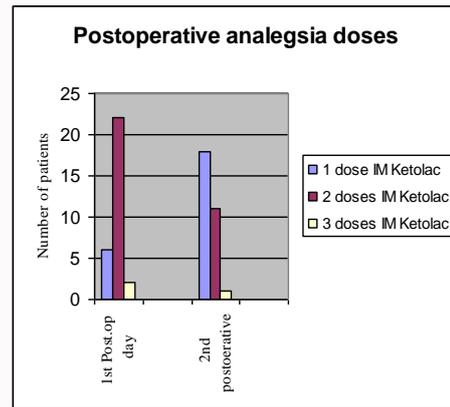
The safety outcomes measures were post-operative bleeding, urinary retention, anal stenosis and sphincter damage. The efficacy outcomes measures were operative time, post-operative pain, analgesia requirement, and length of hospital stay, patient satisfaction and return to normal activities.

**Results**

Table 1 summarizes the demographic and preoperative data of the patients. The main presenting symptoms were bleeding and /or prolapsed mass per annum. Hemorrhoids were grades III and IV. Liver cirrhosis classified as grade B according to Child-Turcotte's classification in 60%of patients.

The average operative time was 27 min (range 20-45 min). Bleeding from the staple line after removal of the hemostatic gauze occurred in seven patients. It required only cauterization of the bleeding spots with re application of the hemostatic gauze for further 5 min (Table 2).

The post-operative Visual Analog Scale (VAS) for recording post-



Graph 2: Post-operative analgesia requirement.

operative pain at 6 h, 12 h, 24 h and 48 h is depicted (Graph 1). VAS score was ≤ 3 in 80% and 93.3% of patients at 1<sup>st</sup> and 2<sup>nd</sup> postoperative days respectively. Analgesia required according to patients self pain assessment. Post-operative analgesia requirement in the first 24 h and the next 24 h is depicted (Graph 2). 73.3% of patients required two doses of parenteral analgesia (Ketolac<sup>®</sup>) in first postoperative day, which reduced to a single dose in 60% of patients in second postoperative day. Post-operative hospital stay was 2-4 days.

There were only three patients (10%) complicated with post-operative urinary retention that needed urinary catheterization. Minor delayed postoperative staple-line bleeding per rectum in the first 48 h, which did not require any intervention, noticed in fourteen of patients (46.7%). It was still present in six of patients at 1<sup>st</sup> month (20%) and finally disappeared altogether at 3 months of follow-up. All patients received the procedure without symptom relapse except six of patients complained of prolapse of mass per rectum during defecation at 1 week -1st month (20%) Both however, recovered and became symptom free at 3 months of follow-up. No patient reported incontinence to flatus or stool and none developed anal stenosis.

**Discussion**

Stapled Hemorrhoidopexy (SH) aims to correct haemorrhoidal prolapse by excising a ring of redundant rectal mucosa above the haemorrhoidal cushions with immediate re-anastomosis of the mucosa using a circular staples- not hemorrhoids per se. By doing this, prolapsing hemorrhoids will be repositioning (hemorrhoidopexy) and shrinking (due to a partial interruption of blood supply to hemorrhoid plexus). In addition, the terminal branches of the inferior hemorrhoidal artery disrupted, and blood flow into the cushions thereby decreased. SH, leaves the richly innervated anal canal tissue and perianal skin intact, thus reducing the pain usually associated with EH [8-10]. Nevertheless, uncertainties around complication rates, recurrence of symptoms and costs preclude its widespread use [11]. SH is simple to perform but, if not done carefully by experienced surgeons who have undergone appropriate surgical training, it can be associated with a number of serious complications caused by a very low peritoneal reflection incorporated into the anastomosis. Proper placement of the purse string suture at least 3-4 cm above the dentate line to incorporate the redundant tissue circumferentially examination the vagina during the application of the purse string and insertion of the stapler to avoids rectovaginal fistula [12-18].

Liver cirrhosis with associated Portal Hypertension (PH) is

common in Egypt as a sequela to the high prevalence of hepatitis C virus. This work elucidates the effectiveness, safety and clinical outcomes of SH for treating symptomatic hemorrhoids in patients with liver cirrhosis. A clinician must differentiate bleeding hemorrhoids from bleeding anorectal varices because they are separate and distinct entities. Hemorrhoids occur independently of anorectal varices and their presence was unrelated to the degree of portal hypertension. There was no relation between portal pressure and the size of hemorrhoids; no relation found between the size of hemorrhoids and the grade of esophageal varices. However, both can bleed and careful examination is essential to prevent misdiagnosis and inappropriate treatment [19-21]. Of note, rubber band ligation contraindicated in patients with advanced cirrhosis with coagulation disorders is generally due to the risk of profound secondary bleeding following the procedure. For portal hypertensive patients with internal hemorrhoids and without coagulation disorders or after the correction of any coagulopathy SH seems to be superior to endoscopic band ligation. However further studies are needed to evaluate EBL in different grades of cirrhosis [5,22].

It worth notice that in this study, four patients with Child's C grade liver cirrhosis could be recruited following intensive medical liver support regimen. Several studies demonstrated that stapled hemorrhoidopexy offers less post-operative pain, and less analgesic requirements, while providing similar control of symptoms. We have noted similar results in our series and all our patients had a post-operative VAS score of <three after 48 h. The operative time for SH has been demonstrated to be shorter than EH in several trials and is generally reported at average 20 (range 15-25) min. Our average operating time of 27 min is a bit longer than that in other studies [23-25]. We needed more operative time in cirrhotic cases than in noncirrhotic cases for it was time consuming to reach hemostasis of the staple line. There were more amounts of blood loss in our patients with Persistent oozing from the stitch hole while undertaking purse-string suture, which eventually controlled by mass suture ligation of the bleeding site. Most of the patients in the study appreciated the SH procedure and returned to normal activities which suggests that is a feasible and safe.

## Conclusion

Stapled hemorrhoidopexy is a feasible and safe approach for prolapsed hemorrhoids concurrent with liver cirrhosis however; a larger scale controlled trials needed to support our results.

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