Delayed Bleeding Following LigaSure Hemorrhoidectomy

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Alexander Becker, MD; Yakov Khromov, MD; and Joel Sayfan, MD, FACS

Abstract

Background

Hemorrhoidectomy is one of the most common procedures performed in anorectal surgery. Regardless of the method of surgical ablation of hemorrhoids it carries the risk of troublesome complications. Postoperative pain, urinary retention, infection, anal stenosis and bleeding are the most common. Delayed postoperative bleeding after hemorrhoidectomy has a reported incidence of 0.9 - 10%. The purpose of this study was to assess the impact of suture ligation of the hemorrhoidal pedicle following Ligasure hemorrhoidectomy on the incidence of delayed postoperative hemorrhage.

Methods

Retrospective review of 180 patients who had Ligasure Hemorrhoidectomy for third and fourth degree hemorrhoids was conducted. Control group (n=90) had the original sutureless Ligasure Hemorrhoidectomy. In the study group (n=90) a modification of our original technique was applied - a hemostatic suture of the hemorrhoidal pedicle was added. Independent t-test was used to determine whether there was a difference in the incidence of postoperative bleeding between the groups.

Results

There were 90 patients in the study group (Ligasure Hemorrhoidectomy with suture ligation of the hemorrhoidal pedicle) and 90 patients in the control group (without suture ligation). There was no statistically significant difference in the incidence of delayed postoperative hemorrhage between the groups (3.3% vs. 6.7%, p>0.33).

Conclusions

Ligasure Hemorrhoidectomy with suture ligation of the hemorrhoidal stalk is not
superior to Ligasure Hemorrhoidectomy alone in respect of preventing delayed postoperative hemorrhage. Nevertheless, there was a trend in the study group towards decreased incidence of bleeding and need for revisional surgery. Larger study seems justified.

**KEYWORDS:** LigaSure hemorrhoidectomy, Delayed bleeding, Suture ligation of
Delayed Bleeding Following LigaSure Hemorrhoidectomy - Is There a Remedy?

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**Keywords:**

LigaSure hemorrhoidectomy, Delayed bleeding, Suture ligation of hemorrhoidal vessels
Introduction

Hemorrhoidectomy is one of the most common procedures performed in anorectal surgery today.

Although many surgical techniques and their modifications have been proposed for the treatment of this widespread disorder, no one has been shown to be superior.

We introduced the Ligasure hemorrhoidectomy in 2001 and found that this "sutureless closed" hemorrhoidectomy is simple, safe and not only shortens the operation but is also followed by easier and shorter recovery (1).

Since 2001 this technique gained worldwide popularity due to significant reduction of operating time and blood loss. Numerous studies consistently showed easier convalescence (2).

Regardless of the method of surgical ablation of hemorrhoids it carries the risk of troublesome complications. Postoperative pain, urinary retention, infection, anal stenosis and bleeding are the most common.

Delayed postoperative bleeding after hemorrhoidectomy has a reported incidence of 0.9 percent to 10 percent (3, 4, 9).

The purpose of this study was to assess the impact of suture ligation of the superior hemorrhoidal vessels as part of ligasure hemorrhoidectomy on the incidence of delayed postoperative hemorrhage.

Materials and methods

Retrospective review of 180 patients who had Ligasure Hemorrhoidectomy for third and fourth degree hemorrhoids was conducted. In the study group (n=90) modification of our original technique was applied - a hemostatic suture of the hemorrhoidal pedicle was added. Control group (n=90) had the original sutureless
Ligasure Hemorrhoidectomy.

The collected data included age, gender, co-morbidity such as hypertension and medications (eg. Aspirin), postoperative bleeding requiring hospitalization or reoperation.

**Technique**

The technical details of the ligasure hemorrhoidectomy using LigaSure, (Valleylab, Boulder, CO) device were described in our previous publication (Figure 1)(1).

Patients in the study group had suture ligation of the pedicle just above the "seal area" of the excised complex using a monocryl suture (Figure 2).

All the operations were performed by the same surgeon (J.S.) as day-surgery cases.

Follow–up examinations were conducted 1, 3, and 6 weeks after surgery.

Only significant bleeding requiring physician attention or hospitalization was considered as a postoperative hemorrhage.

**Statistical Methods**

Chi-square tests or Fisher exact tests were used to determine group differences in the categorical measures. Descriptive statistics were calculated to summarize the demographics of the study population. All parameters were included in the univariate analysis. Data are expressed as mean ± SD or as proportions. Independent t-test was used to determine whether there were any differences in the two groups.

Statistical significance was considered if p < 0.05.

The study was approved by the Institutional Review Board.

**Results**

During four-year period from 2005 to 2009, 180 patients underwent sutureless ligasure hemorrhoidectomy. There were 90 patients in study group (ligasure
hemorrhoidectomy with suture ligation of the hemorrhoidal pedicle) and 90 patients in control group (without ligation).

There were 50 men and 40 women in study group and 54 men and 36 women in control group. The mean age was 48.4 years (range 24-75, SD ±13.0) in study group and 47.6 years (range 26-76, SD± 11.4) in control group. There were no statistically significant demographic differences between the two groups or any differences as concerns hypertension or aspirin usage (Table 1).

All patients suffered from grade three or four of the hemorrhoids. The indications for hemorrhoidectomy were similar for both groups (Figure 3).

There were three patients (3.3%) in the study group with delayed postoperative hemorrhage. Two patients were taken to the operating room and underwent suture ligation of bleeding site and one patients required hospitalization only.

In the control group there were 6 (6.7%) patients diagnosed with postoperative hemorrhage. Four patients underwent surgery and two patients required only hospitalization and observation. There was no need for blood transfusion in either group.

All patients with delayed post-operative bleeding had large grade 4 mixed hemorrhoids. The "post-operative bleeders group" was younger, mean age 41.3 (range 26-55, SD ±11), seven out of nine patients were male (77%). Bleeding was the most common indication for the elective surgery (77%) in this "subgroup".

There was no statistically significant difference in the incidence of delayed postoperative hemorrhage between the groups (3.3% vs 6.7%, p>0.33) (Table 2).

**Discussion**

Surgical intervention is indicated for symptomatic mixed internal and external hemorrhoids. Different techniques have been described including classical Milligan-Morgan excision, Harmonic Scalpel dissection, stapled hemorrhoidopexy, and Ligasure hemorrhoidectomy.
Regardless of the technique of surgery for hemorrhoids, delayed hemorrhage following surgical procedure is a well-recognized complication. The rate of postoperative bleeding varies significantly in different studies. The low rate of 0.8% of the delayed postoperative bleeding has been reported (4). Armstrong et al evaluated the incidence of postoperative complications in five hundred cases of Harmonic Scalpel hemorrhoidectomy for grade 2-4 hemorrhoids and found 0.6% of delayed bleeding (5).

Other authors reported higher rate of delayed hemorrhage. Ibrahim compared complications between diathermy and scissors for closed hemorrhoidectomy and reported postoperative bleeding rate of 4% (6).

Postoperative hemorrhage is the most common complication in stapled hemorrhoidopexy. Low rate of 1.3% of delayed bleeding after this procedure was reported [7]. Nevertheless, other authors found significantly higher rate of this complication in patients undergoing stapled hemorrhoidopexy ranging from 3.5% to 5.9% (8).

High postoperative bleeding rate of 10.2% was seen by Arbman who compared complication rate and long-term results for closed (Ferguson) and open (Milligan-Morgan) hemorrhoidectomy (9).

Ligasure hemorrhoidectomy having advantages of decreased operation time, blood loss and postoperative pain has comparable incidence of postoperative hemorrhage. Tan et al in meta-analysis of 9 studies comparing the results of Ligasure hemorrhoidectomy with conventional techniques for patients with grade 3 or 4 hemorrhoids found no difference in postoperative bleeding rate. Delayed hemorrhage ranged from 0.24 to 2.9% (2).

In our study we had a relatively high percent of delayed postoperative hemorrhage (3.3% in group with additional suture above the hemorrhoidal pedicle and 6.7% without such a suture). Some explanation for this may be that all patients with delayed post-operative bleeding had very large grade 4 mixed hemorrhoids. Patients were younger with male sex predominance. The small number of patients did not allow us to draw significant conclusions regarding the characteristics of patients who are prone to develop post-operative bleeding.

There were some attempts to characterize patients prone to postoperative haemorrhage. Chen et al studied 4880 patients undergoing closed hemorrhoidectomy.
The variables included age, gender, surgeon, suture material, aseptic preparation and use of antibiotics. Patient's gender and individual surgeon were independently associated with high risk of bleeding (3). We didn't find any difference between groups in terms of demography, co-morbidity status and peri-operative medication use (e.g. aspirin).

In order to decrease the rate of postoperative bleeding after Ligasure hemorrhoidectomy Carditello et al proposed to modify the technique by using a continuous Vicryl suture (10). Nevertheless, his reported rate of postoperative bleeding was as high as 5.2%. Moreover applying additional suture line over the "post-hemorrhoidectomy bed" can entrap internal sphincter and cause significant pain in the post-operative period. This led us to modify our original technique of Ligasure hemorrhoidectomy by adding a single monocryl stitch just above the hemorrhoidal pedicle. Using this additional suture just above the stump of hemorrhoidal pedicle may improve the hemostasis and avoids the internal sphincter as care is taken to include only the mucosa and submucosa in this stitch.

Our study did not show statistically significant difference between the two groups. Nevertheless, there was some trend towards decrease of postoperative bleeding and reoperation rate in patients who had the modified technique.

**Conclusions**

Delayed postoperative bleeding after hemorrhoidectomy is a serious problem causing morbidity and need for hospitalization and even reoperation.

Ligasure hemorrhoidectomy with suture ligation of the hemorrhoidal stalk was not statistically superior to ligasure hemorrhoidectomy alone in respect of preventing delayed postoperative hemorrhage in this rather small pilot study. Nevertheless, there was a trend in the study group towards decreased incidence of bleeding and need for revisional surgery.

Larger prospective studies may clarify the role of a hemostatic suture in improving short-term outcome after Ligasure hemorrhoidectomy as well as characterize patients who are especially prone to develop this complication.
References


Figure 1.

Ligasure Hemorrhoidectomy – "seal zone".
Figure 2.

Suture - ligation of the pedicle just above the "seal area" of the excised complex using monocryl suture.
Figure 3.
The indications for hemorrhoidectomy were similar for both groups.
Table 1.

**Demographic data**

<table>
<thead>
<tr>
<th>Group</th>
<th>Control Group</th>
<th>Study Group</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td>Number</td>
<td>90</td>
<td>90</td>
<td>NS</td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>47.6±11.4</td>
<td>48.4±13</td>
<td>NS</td>
</tr>
<tr>
<td>M</td>
<td>54(60%)</td>
<td>50(55%)</td>
<td>NS</td>
</tr>
<tr>
<td>F</td>
<td>36(40%)</td>
<td>40(45%)</td>
<td>NS</td>
</tr>
<tr>
<td>Hypertension</td>
<td>11(12.2%)</td>
<td>12(13.2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Aspirin usage</td>
<td>2(2.2%)</td>
<td>4(4.4%)</td>
<td>NS</td>
</tr>
</tbody>
</table>

Control Group. Ligasure Hemorrhoidectomy.

Study Group. Ligasure Hemorrhoidectomy with hemostatic suture of the hemorrhoidal pedicle.

P-NS (non significant).

Table 2.

**Delayed postoperative hemorrhage.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Control Group</th>
<th>Study Group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>6(6.7%)</td>
<td>3(3.3%)</td>
<td>&gt;0.33</td>
</tr>
<tr>
<td>Need for surgery</td>
<td>4(4.4%)</td>
<td>2(2.2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Hospitalisation</td>
<td>6(6.7%)</td>
<td>3(3.3%)</td>
<td>NS</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

Control Group. Ligasure Hemorrhoidectomy.

Study Group. Ligasure Hemorrhoidectomy with hemostatic suture of the hemorrhoidal pedicle.

P-NS (non significant). Study Group.