

Original Research Article

A prospective study on suture ligation of internal hemorrhoids without Doppler guidance for the treatment of symptomatic hemorrhoid disease

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ABSTRACT

Background: Hemorrhoids or piles are one of the most common afflictions of human being, affecting both sexes & can occur at any age. The aim of the study was to study the effectiveness of suture ligation of hemorrhoids and mucopexy as an outpatient treatment for symptomatic hemorrhoids.

Methods: This prospective observational study was carried out in the department of surgery, Gandhi Medical College, Bhopal, Madhya Pradesh, India on 64 adult patients of hemorrhoids treated by suture ligation of hemorrhoid pedicle without Doppler guidance and mucopexy from July 2012 to December 2014. The patients were managed as outpatient or day care cases. The observations and follow up data were recorded and descriptive analysis was done to study the clinical presentation of hemorrhoid disease and effectiveness of hemorrhoid ligation and mucopexy in an ambulatory, outpatient or day care setting.

Results: Total 64 patients of hemorrhoids who underwent suture ligation of hemorrhoids and mucopexy were studied. Most of the patients were between 31- 60 years of age (74.28%) with males predominance (64.06%). All the patients in this study had bleeding per rectum as the main symptom. All patients had hemorrhoids in primary 3, 7 or 11 'o clock positions and 21 patients (32.8%) had secondary hemorrhoids as well. Majority the patients had 1-3 degree hemorrhoids. However hemorrhoid ligation was also done in 7 patients with fourth degree hemorrhoid who were severely anemic and unfit for surgery due to co morbidities. Over all 82.81% patients were free from symptoms at 1 year follow up after the procedure and only 7.81% of the patients had recurrence of bleeding or prolapse.

Conclusions: Hemorrhoid suture ligation with mucopexy is a simple, safe & cost-effective ambulatory treatment for the patients of symptomatic hemorrhoids. Overall the results of hemorrhoid ligation and mucopexy were satisfactory with good control of patients complains.

Keywords: Doppler guided hemorrhoid artery ligation, Dearterialization of hemorrhoids, Hemorrhoids, Mucopexy, Piles, Rubber band ligation, Recto-anal rectopexy

INTRODUCTION

Hemorrhoids or piles are one of the most common afflictions of human being, affecting both sexes and can occur at any age. Turell, stated that 70% population suffers from hemorrhoids and in people over the age of 50 year 50% patients have some degree of hemorrhoidal problem. Males seem to be affected 2-3 times more frequently as compared to females.

Hemorrhoids are vascularized cushions in the anal canal forming discrete masses of thick submucosa containing blood vessels, smooth muscles and elastic and connective tissues. They occur primarily in left lateral, right anterior and right posterior positions (3, 7 and 11 'o clock positions). Secondary hemorrhoids may also develop adjacent to these primary positions. Various factors that contribute to development of hemorrhoids are constipation, straining, prolonged squatting, nutrition,

pregnancy, aging, hereditary, portal hypertension, abdominal tumors etc. External hemorrhoids are distal to the pectinate line and are visible at the external anal orifice. They are covered by anoderm. Internal hemorrhoids are proximal to the pectinate line and can be seen inside the anal canal on proctoscopy. Internal hemorrhoids are classified into 4 grades as follows:

First degree

Veins of anal canal increase in number and size, and they bleed on defecation

Second degree

Hemorrhoids prolapsed outside anal canal but reduce spontaneously

Third degree

Hemorrhoids protrude outside anal canal and require manual reduction

Fourth degree

Irreducible hemorrhoids that remain constantly prolapsed

Clinically, hemorrhoids usually present with bleeding, prolapse, pain (with thrombosis or ulceration), perianal mucous discharge, or pruritis. The complications of hemorrhoids are thrombosis, infection with inflammation, ulceration, and anemia. The initial treatment for symptomatic first- and second-degree hemorrhoids with a short history of bleeding, prolapse, or itching and pain is directed to control constipation with dietary measures like a high-fiber diet, sitz bath, stool softeners, laxatives, and various topical creams.^{1,2}

It has been now widely accepted that piles are nothing more than a sliding downwards of part of the anal canal lining.¹ It is therefore obvious that treatment measures have to address the reduction of the prolapse as well as reduction of blood flow to the hemorrhoid mass. When medical treatment fails, ambulatory treatment is advised. Ambulatory treatments for hemorrhoids include injection sclerotherapy, rubber band ligation, cryosurgery, infrared coagulation, and ultrasonic doppler-guided transanal hemorrhoidal ligation. Surgical treatment for hemorrhoids includes open or closed hemorrhoidectomy and stapled hemorrhoidopexy.

Hemorrhoid band ligation is the most popular & effective ambulatory treatment for hemorrhoids as reported in many studies.²⁻⁷ Theoretically the principles of band ligation i.e. reduction of blood flow to the hemorrhoid mass and fixation of the prolapsed mucosa can be more adequately and effectively done by direct suture ligation of hemorrhoid pedicle and mucopexy. Dearterialization of hemorrhoids, either with suture ligation (DGHAL/THD) or laser along with mucopexy for prolapsing hemorrhoids has been studied and found to be

safe and effective minimally invasive outpatient treatment for symptomatic hemorrhoids.⁸⁻²⁰ However the added value of Doppler guidance has recently been challenged in some studies.^{11,17,18} Suture ligation of hemorrhoid pedicle without Doppler guidance has been reported by many authors in different studies but its effectiveness and advantages in treatment of hemorrhoids needs to be validated by evidence base. It was with this objective that this study was conducted in our department of surgery, Gandhi Medical College, Bhopal, India.

METHODS

This prospective study on suture ligation of hemorrhoids and mucopexy was carried out in Department of Surgery, Gandhi Medical College, Bhopal, India. In this study 64 adult patients who underwent suture ligation for hemorrhoids from July 2012 to December 2014 were included. The study was approved by the ethical committee of our hospital and informed consents were taken from the patients.

Inclusion criteria

- Patients with first-degree, second-degree, and some cases of third-degree hemorrhoids, when the patient complained of bleeding or prolapse of hemorrhoids.
- Severely anemic patients with fourth-degree hemorrhoids who were unfit for surgery and presented with bleeding.

Exclusion criteria

- Patients using anticoagulants
- Any septic process in the anorectal region
- Large grade IV hemorrhoids

Mucopexy was performed for prolapsing hemorrhoids.

The relevant data was collected and recorded in excel sheet. The demographic profile, clinical symptoms, no of patients operated, associated procedures performed, postoperative complications and long term results were recorded. Follow-up was at day 5, 14, 1 month, 3 months postoperatively. A descriptive analysis of data collected of these patients was done.

All the patients who presented with symptomatic hemorrhoid disease were preoperatively evaluated by routine investigations like complete blood picture, bleeding time, clotting time, blood urea and sugar. In patients older than 40 years, or if there was clinical suspicion of polyps and other colonic pathology colonoscopy is advised before treating them for hemorrhoids.

A colonoscopy was also advised when hemorrhoids did not appear to be the cause of bleeding. Patients taking aspirin were advised to stop the medication at least 7 days before the procedure.¹

Operative procedure

The procedure was performed under local anesthesia in all patients. With the patient in lithotomy position a perianal field block was given using 0.5% lignocaine with adrenaline. A subcutaneous circumanal infiltration is done in the hemorrhoid tissue. Then deep injections are made in the intersphincteric groove in all the four quadrants. This causes paralysis of the sphincter mechanism and total perianal anesthesia.

A proctosigmoidoscopy or anoscopy was done just before the procedure. The Parks anal speculum or an anoscope with a long slit on one side was used for the procedure. Preceding lateral internal sphincterotomy under local anesthesia was done simultaneously for patients with chronic anal fissure with high anal sphincter tone associated with hemorrhoids.

An Allis forceps was applied to the external skin tags corresponding to the three primary hemorrhoids and pulled to visualize the corresponding internal hemorrhoid vascular cushion. The pedicle of the hemorrhoids was visualized. A second Allis forceps was then applied to the redundant internal hemorrhoid mass above the level of pectinate line. Then the hemorrhoid pedicle was transixed and ligated with 2-0 vicryl on round body needle in order to occlude the superior hemorrhoidal vessel as they enter the internal hemorrhoids. For prolapsing hemorrhoids the same suture was run down on the pile mass as continuous suture taking lesser bites on the mucosa of prolapsing redundant hemorrhoid tissue. The two ends of the suture were then pulled together and snugly tied to hitch up and fix the prolapsing hemorrhoid. Thus in effect the prolapsing hemorrhoid are lifted up and fixed back to the lower rectum. Similar procedure was done on the other primary or secondary hemorrhoids. A small piece of gauze soaked in saline was left at anal verge and a pad was kept for soakage dressing.

Postoperatively stool softeners and bulk agents were prescribed. The patients were warned about the possibility of bleeding after the procedure and advised to contact the surgeon if bleeding was severe or persistent. In cases of pain or fever, the patients were advised to come for consultation. A sitz bath was advised to keep the anal area clean and hygienic to prevent infections and reduce pain. Patients were managed as outpatient or day care cases. All the patients were prescribed oral antibiotics, tinidazole and analgesics at the time of discharge.



Figure 1: Hemorrhoid suture ligation.

RESULTS

Amongst 64 patients majority were males 41 (64.06 %) and 23 were females. The distribution of patients in different age groups was as per table below. Most of the patients were between 30 - 60 years (74.28%) age group (Table 1).

Table 1: Age and sex wise distribution of patients.

Age group (years)	Male	Female	Total	Percentage
11-20	02	00	02	0.03
21 -30	05	04	09	14.06
31 -40	14	06	20	31.25
41 -50	11	05	16	25.0
51 -60	05	06	11	18.03
>60	04	02	06	09.37
Total	41 (64.06%)	23 (35.93%)	64	

Bleeding per rectum was the most common symptom and was present in all patients. Palpable mass at anal verge, pain during defecation, mucous discharge, pruritis, constipation and anemia related symptoms were as per Table 2 below. Type and grade of hemorrhoids (Table 3

and Table 4). Procedures done: Besides hemorrhoid ligation and mucopexy as was required for the patient we performed lateral sphincterotomy for concomitant fissure in ano in 11 patients. Fistula tracts were laid open in 5 patients (Table 5 below).

Table 2: Clinical symptoms of haemorrhoids.

Symptoms	No of cases	Percentage
Bleeding per rectum	64	100
Prolapsed/ palpable pile	42	65.62
Pain during defecation	21	32.81
Discharge	14	21.87
Pruritis	08	12.5
Constipation	18	28.12
Giddiness/ weakness	06	09.37

Table 3: Type of haemorrhoid.

Type of hemorrhoid	No of cases	Percentage
Primary	64	100
Secondary	21	32.81

Table 4: Grade of haemorrhoids.

Grade of hemorrhoid	No of cases	Percentage
First degree	12	18.75
Second degree	21	32.81
Third degree	24	37.5
Fourth degree	07	10.93

Table 5: Operative procedure performed.

Operative procedure	No of cases	Percentage
Hemorrhoid ligation	64	100
Mucopexy	52	81.25
Lateral sphincterotomy	11	18.03
Laying open of fistula tract	05	7.81

Postoperative complications were as per Table 6. Postoperative pain and local edema was the most common complication observed in our study.

Table 6: Postoperative complications.

Postoperative complications	No of cases	Percentage
Pain and edema	12	18.75
Bleeding	05	07.81
Infection with purulent discharge	02	03.12
Tenesmus and diarrhea	03	04.68

Table 7: Long term results.

Complain	No of cases	Percentage
Pain	05	07.81
Re-bleeding	04	06.25
Prolapse	02	03.12
Fistula in ano	01	01.56

DISCUSSION

In this study most of the patients (74.28) were between 30-60 years of age and males were more often affected (64.06%). The common complains for which the patient presented to hospital was bleeding per rectum (100%), prolapse of piles (65.62), pain (32.81), discharge, pruritis etc. The basic principle of outpatient treatment is to obliterate the blood supply of hemorrhoid and fix the mucosa above the prolapsing hemorrhoid. Of all ambulatory treatments Hemorrhoid band ligation is one of the most common outpatient treatments available. In this procedure, a rubber band is applied to the base of the hemorrhoid to hamper the blood supply to the hemorrhoid mass. The hemorrhoid then shrinks and falls off within 2-7 days. Rubber band ligation is usually performed in an ambulatory setting. The procedure causes less pain and has a shorter recovery period than surgical hemorrhoidectomy.

Its success rate is between 60% and 80%.¹⁻³ A number of prospective studies have found rubber band ligation to be a simple, safe, and effective method for treating symptomatic first, second, and third-degree hemorrhoids as an outpatient procedure with significant improvement in quality of life.¹⁻⁶ Hemorrhoid band ligation has a limited morbidity, good results, long-term effectiveness, and good patient acceptance. It has been found to be safe even for patients with cirrhosis and portal hypertension and for patients on anticoagulation therapy.^{2,3} However it has been observed that many times bands applied for hemorrhoid ligation fall out immediately or very soon after application thus decreasing the effectiveness of the procedure and sometimes causing troublesome bleeding. Sometimes severe pain results after band application due to inappropriate positioning of the band. Also bands cannot be applied if the mucosa is not redundant.

The basic principles of ambulatory treatment for hemorrhoids i.e. obliteration of blood supply and fixation of the prolapsing mucosa can be more precisely and effectively applied by suture ligation of hemorrhoids pedicle and mucopexy. Suture ligation of hemorrhoid pedicle and mucopexy results in shrinking of the hemorrhoid, lifting up of prolapsing mucosa and formation of a tissue scar that integrates with the anal tissue. Surgeons have the advantage of direct visualization of the hemorrhoid pedicle, including the complete pedicle, securing adequate hemostasis, ligating all primary and secondary hemorrhoids and performing mucopexy for prolapsing hemorrhoids. Since the sutures are placed in the lower rectum and the redundant upper part of prolapsing hemorrhoid there is minimal pain after the procedure. This has been shown in our study and many other studies.

Most complications of hemorrhoid ligation and mucopexy are minor and self-limiting; they can be managed on an outpatient basis. In our study some

discomfort in the anal region was reported for a few days and was usually relieved by sitz baths and analgesics.

Pain

Twelve patients (18.75%) had postoperative pain and edema which was treated by analgesics and antibiotics. While performing mucopexy one should be careful to remain well above the dentate line in the insensitive area to avoid post procedural pain.

Infection

Three patients had postoperative infection with purulent discharge and three patients complained of tenesmus and diarrhea for 5-7 days postoperatively. All these postoperative complain were controlled by sitz bath for local hygiene, tinidazole and oral antibiotics given for 5-10 days. The patient should be always carefully examined for anorectal complains before the procedure. Failure to recognize a septic process in this region may lead to fatal sepsis with extensive cellulitis and gangrene after the procedure.

Bleeding

Because of the risk of hemorrhage the procedure should be avoided in patients on anticoagulant therapy. Patients taking aspirin should stop the medication at least 14 days before the procedure.¹ In our study five patients (7.8%) had mild bleeding per rectum postoperative which subsided on its own in few days. Late bleeding (1-2 weeks later) can occur and may be significant. Patient should be advised to keep a watch on the amount of blood loss. If bleeding is reported, anosopic examination should be done under adequate visualization and anesthesia. If the bleeding site is identified, suture ligation should be done. If the patient is pale, hypotensive, and tachycardic, hospitalization and blood transfusion may be required.

Complications of hemorrhoid band ligation reported in other studies are pain (32%), vasovagal symptoms (dizziness and fainting), bleeding (1-5%), external hemorrhoid thrombosis (2-3%), ulceration, and fulminant sepsis.^{2,3} Thrombosis of the corresponding external hemorrhoid may occur after internal hemorrhoid ligation in 2-3% of cases. Excision of the thrombosed external hemorrhoid may be required. Sepsis has been reported in a few cases after hemorrhoid ligation. The septic patient presents with fever, anorectal pain, perineal pain, scrotal swelling, difficulty in micturition and cellulitis. Treatment is with debridement, wound toilet, and parenteral antibiotics.¹

Recurrence and long term results

In five patients (7.8%) in our study mild postoperative pain in perianal region persisted even after 3 months. Local examination revealed mild tenderness but no active

inflammation. Sitz bath and analgesic were advised for these patients. Four patients (6.25%) complained of recurrent bleeding per rectum for which injection sclerotherapy was done. Two patients had prolapse of hemorrhoid but no bleeding. Hemorrhoidectomy was done for the recurrent prolapsing hemorrhoid in these patients. One patient presented with perianal fistula about 1 year after the ligation of hemorrhoids. The fistula tract was laid open.

In this study 11 patients has long term complains 1 year after the procedure, which were addressed by conservative or operative treatments. Thus 82.81% of the patients could be satisfactorily managed by hemorrhoid ligation and mucopexy in our study. Hemorrhoid band ligation has a recurrence rate of about 20-30% in 5 years in different studies.¹⁻⁷ Dearterialization procedures like hemorrhoid artery ligation have a recurrence rate of 5-18% in various studies.⁸⁻¹⁹ We didn't have long term results in our study but short term results in our study showed that a single treatment can achieve satisfactory results. If the symptoms of bleeding and prolapse due to hemorrhoids are not relieved, further hemorrhoid ligation or other conservative treatment may be tried. If the symptoms are still not controlled hemorrhoidectomy may be considered.

Doppler-guided hemorrhoidal artery ligation (DGHAL and RAR) is also a minimally invasive technique for the treatment of symptomatic hemorrhoids that has been applied successfully for grade II and III hemorrhoids and sometimes in grade IV hemorrhoids. But it requires costly Doppler ultrasound with probes and a special proctoscope that enables the combination of hemorrhoidal artery ligation with transanal rectoanal repair (mucopexy). Doppler-guided haemorrhoid artery ligation requires the use of an ultrasound (Doppler) to identify the arterial vascular pedicle of the haemorrhoid. This pedicle is then tied with a stitch under direct ultrasound guidance. Ligation of artery is confirmed by the absence of a pulsatile arterial wave form on Doppler. Hemorrhoids thus shrink due to reduction of blood flow to the hemorrhoids. Usually 3-8 hemorrhoid artery pedicles are ligated using Doppler guidance. It has also been shown to be effective in over 90% of cases, with recurrence of 5-18% in different studies.⁸⁻¹⁹ In a double blind randomized control trial comparing Doppler guided hemorrhoidal artery ligation and mucopexy with simple ligation of hemorrhoids and mucopexy no advantage was found for the Doppler group.

While operative time (31 min versus 9 min $P < 0.003$), postoperative pain (4.4 versus 2.2, $P < 0.002$ (visual analogue scale) and need for analgesia (17 versus 11 tablets, and 13 days versus 9 days, respectively; $P < 0.01$) was significantly higher in the Doppler group, complications were similar in both the groups and recurrence of hemorrhoids was not statistically significant in either group (4 patients in simple ligation group and 3 patients in Doppler group; $P < 0.93$).¹¹ It is recognized that the width of the suture ligation incorporates a larger

quantity of tissue, thus including the underlying arteries regardless of Doppler-guidance. The advantages of HAL/suture ligation over conventional excisional methods are significantly reduced postoperative pain and preservation of anal anatomy and physiology.¹⁷⁻¹⁹

In this study most patients were managed as ambulatory, outpatient or on a day care basis. The advantage as we observed was simplicity of the procedure, less postoperative pain, insignificant bleeding during the procedure and postoperatively, all hemorrhoids and other perianal problems like fissure and fistula can be addressed simultaneously, no incidence of postoperative urinary retention and anal stenosis and no need for costly and specialized instruments like Barron band ligator or Doppler ultrasound.

CONCLUSION

Hemorrhoid ligation with mucopexy is a simple, safe and cost-effective ambulatory treatment for the patients of symptomatic hemorrhoids. It can be performed on an outpatient or day care basis on all grades of hemorrhoids to control bleeding and prolapsing hemorrhoids. Overall the results of hemorrhoid ligation and mucopexy were satisfactory with good control of patients complains.

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Ethical approval: The study was approved by the institutional ethics committee

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