Original Article

A prospective randomized controlled trial comparing the immediate post-operative complications between open and semi-open hemorrhoidectomy

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Abstract

Introduction: Hemorrhoids are one of the most common anorectal pathologies encountered by general surgeons during their practice. Open technique as described by Milligan and Morgan and closed technique as described by Ferguson are the most widely used. A semi-open technique that has lesser complications than the conventional open hemorrhoidectomy has been described.This study aims to compare the immediate postoperative complications between open and semi-open hemorrhoidectomy.

Methods: A prospective randomized study, where patients with third and fourth-degree hemorrhoids undergoing hemorrhoidectomy, were taken for the study. The subjects were randomized into two groups, where they underwent either open or semi-open hemorrhoidectomy. Both groups received standard postoperative care and were evaluated after 24 hours after surgery for pain and urine retention and were then discharged with the same treatment plan for both groups. First, follow up was done in one week and the second was done in two weeks after discharge, where pain score, bleeding, wound healing, use of narcotic analgesics and patient discomfort were recorded.

Results: A total of 44 patients were divided into two groups, where the age, sex, and grade of hemorrhoids were matched. The pain score using VAS in the first week was compared and it showed that the pain perceived by the patients in the open hemorrhoidectomy was greater than in the semi-open method ((p=0.06, 95% CI= 0.22 to 1.23). Bleeding rate after the surgeries were not different between the two groups (p=0.43) and the urinary retention between them was also not significant (p=0.47). The use of breakthrough narcotic analgesics was more in the open hemorrhoidectomy group (p=0.01). On the fourteenth day follow up, the wound of those who underwent semi-open hemorrhoidectomy, had significantly healed as compared to those who had undergone the open procedure (p= 0.04, 95% CI=0.23 to 0.76), and the patients who had semi-open hemorrhoidectomy had lesser discomfort as compared to the open technique (p=0.02).

Conclusion: Semi-open hemorrhoidectomy has fewer post-operative complication rates as compared to open hemorrhoidectomy with decreased pain, faster wound healing rates, and lesser patient discomfort.

Keywords: Hemorroids; Open Hemorroidectomy; Semi-open Haemorroidectomy

Introduction

Hemorrhoids are one of the most common anorectal pathologies encountered by general surgeons during their practice. The prevalence of hemorrhoids is varied when compared to different geographical regions and ranges from 4.4% to 39%, with 44.7% of these being symptomatic.[1] The actual prevalence may be even higher as 88% of patients undergoing an endoscopic examination of the rectum have some degree of hemorrhoids.[2] Only about one-third of the patients with hemorrhoids actually seek medical help.[3] Hemorrhoids are classified as internal and external types,

depending upon their relationship to the dentate line. The internal hemorrhoids are divided according to the amount of prolapse, by Goligher, and they are Grade 1: bleeding from the anal cushion without prolapse, Grade2: mild prolapse on straining but reduces spontaneously, Grade3: prolapses on straining or in exertion but needs manual reduction, and Grade 4: irreducible prolapse.[4]

The pathophysiology of hemorrhoids is not totally understood. The anal canal cushions, which work to maintain the anal continence, protect the sphincters during defecation and help to differentiate solids, liquids, and gas, which eventually helps in the decision to evacuate.[5] It was proposed that hemorrhoids occur when there is hyper vascularization of the hemorrhoidal artery, making it wider with increased blood flow.[6] The most accepted theory is the "sliding anal canal theory."[7] This theory states that the anal cushions' supporting tissues are lost gradually and eventually the muscle fibers are replaced by connective tissue. The most common presenting symptoms of hemorrhoids are painless bleeding, pruritus, discomfort, discharge, soiling, prolapse and thrombosis of the prolapsed hemorrhoid.

The treatment options for hemorrhoids are also varied and grouped according to the stage of the disease. Grade 1&2 hemorrhoids are treated either with diet and lifestyle modifications or with interventions such as rubber band ligation, sclerotherapy, oral or topical medications, infrared and radiofrequency coagulation, bipolar diathermy and direct-current electrotherapy, cryosurgery and laser therapy. Grade 3&4 hemorrhoids are usually treated with hemorrhoidectomy, diathermy hemorrhoidectomy, ligasure hemorrhoidectomy, harmonic scalpel hemorrhoidectomy, hemorrhoidal artery ligation with or without anopexy, Farag procedure, anopexy and stapled hemorrhoidopexy. In the conventional hemorrhoidectomy, open technique as described by Milligan and Morgan[8] and closed technique as described by Ferguson[9] are the most widely used. Although open hemorrhoidectomy is one of the standard procedures and used extensively, pain after the surgery, delayed healing time, urine retention and anal canal structures are known complications of this surgery. To decrease these complications, Reis Neto-Rene Obando described a semi-open technique that has lesser complications than the conventional open hemorrhoidectomy.[10] As the hemorrhoidal disease is very common within the population presenting in our out-patient surgical department and hemorrhoidectomy is needed in most of them, the complications mentioned above were regularly found with the open technique. As we started to use the semi-open technique, with a little modification, we felt that the complications lowered down a little. To compare the results and the complications rate between the open and semi-open technique, a study was done in the surgical department, to find the best option for patient wellbeing.

Methods

A prospective randomized study was conducted in the National Academy of Medical Sciences (NAMS), Bir hospital, starting from 2008 to 2012. The patients were selected with third and fourth-degree hemorrhoids, who presented to the surgical out-patient department. Informed consent was obtained from each individual regarding the procedure and study enrolment.

All the patients with third and fourth level hemorrhoids, who were fit for anesthesia were taken in the study. The participants of the study were all 18 years and older and were able to comprehend the pain scale that was brought to their attention a day before the surgery. The exclusion criteria were patients with thrombosed piles, medically unfit patients, patients on steroids for various reasons, hemorrhoids with concomitant anal canal diseases and patients with simultaneous multiple external hemorrhoids.

The study population was selected from the out-patient general surgical department. After the complete history, general examination and proctoscopy examination, they were then sent for necessary investigations. The patients were then sent for a pre-anesthetic checkup and those fit for surgery were given dates for elective surgery. They were then divided randomly into two groups, irrespective of their gender and age. The patients were assigned consecutive numbers 1,2,3,4. and patients with even numbers underwent open hemorrhoidectomy, while patients with odd numbers had semi-open hemorrhoidectomy. A total of 44 patients were enrolled in the study. Group 1 consisted of patients who would undergo open hemorrhoidectomy, and group 2 consisted of patients who would be treated with modified semi-open hemorrhoidectomy.

Both groups of patients received spinal anesthesia for the procedure, position and preparation were standard for both groups. The participants of group 1 then underwent open hemorrhoidectomy, following the description as described my Milligan and Morgan, where the wound was left open with minimal packing done after proper hemostasis. The group 2 participants underwent the modified semi-open procedure, where after adequate preparation, a gauge piece was introduced in the anal canal and the hemorrhoid was delivered out, which was then secured using an Allis' tissue

forceps. A proctoscope was introduced and a suture taking the mucosa and submucosa, at the upper end of hemorrhoid, was applied. The suture was not cut and remained with the needle. The external part of the skin plexus was then cut using a V-shaped incision extending up to the dentate line. The skin and subcutaneous tissue were then separated from the underlying structures. A non-traumatic artery forceps were then applied at the base of hemorrhoids extending to the upper limit but not encompassing the upper limit suture. The tissue above the artery forceps was divided using diathermy. A continuous suture over the artery forceps taking mucosa and sub-mucosa was applied, ending at the dentate line. The artery forceps were then removed and the suture tightened and a knot was tied. The part below the dentate line was not sutured and left open. (Figure 1,2,3)

Post-operative standard care was given to both groups of patients. They all received sitz baths, fiber-rich food, laxatives, and oral analgesics after discharge. Antibiotics were given for the first 24 hours after the surgery and stopped after the first inspection if all was well. Pain scores and urine retention experienced in the first 24 hours after the surgery was recorded and the patients were discharged. The first follow-up was done in 1 week and the second follow-up was in the second week after discharge. Pain score using the visual analog scoring system (1-100) was recorded, which was then categorized to 0-no pain, 1-mild pain, 2-moderate pain, and 3-severe pain. Bleeding from the incision site was noted in the follow-up, as were the healing process and the patient discomfort.

All the data were entered in the pre-printed score sheet and analyzed using SPSS software. Spearman's correlation test was used for comparisons and the Student t-test was used to compare the means. Approval was taken from the institutional review board.

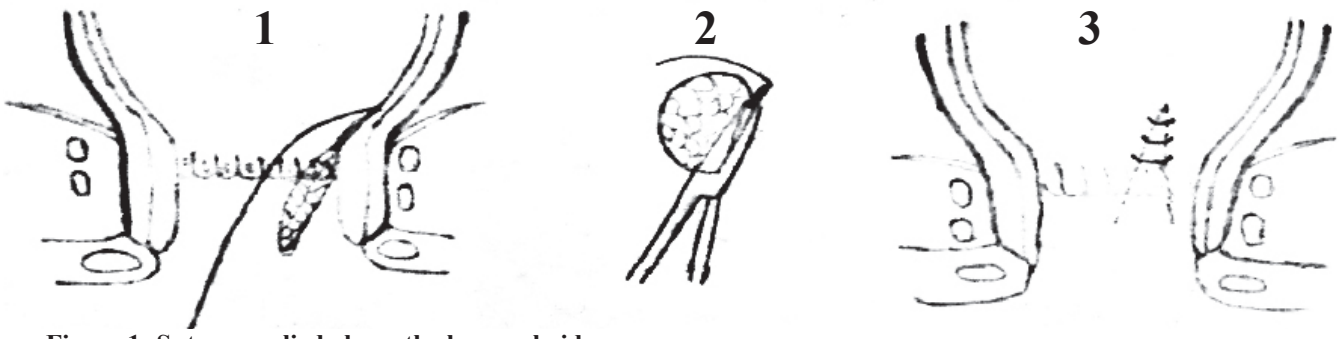

Figure 1: Suture applied above the hemorrhoid

Figure 2: Hemorrhoid clamped with artery forceps

Figure 3: Sutures taken up to the dentate line

Results

A total of 44 patients were taken for the study with 22 patients in each randomized group. There were no patients excluded from the study, as all cases were strictly passed through the exclusion criteria. In group 1, which was the open hemorrhoidectomy group, there were 14 male patients and 8 female patients. Likewise, in group 2 (semi-open hemorrhoidectomy), there were 16 male patients and 6 female patients. The mean age of all patients was 35.23, with the mean age of group 1 was 34.95 and group 2 was 35.50.

The outcomes that were compared between the two groups were pain intensity and urine retention experienced by the patients in the first week, bleeding from the incision site, healing of the wound in two weeks and discomfort experienced by the patients at two weeks. The pain in the first 24 hours was not taken as an invasive procedure like hemorrhoidectomy would cause some amount of pain for the participants. The pain reported by the patients were recorded by the surgeon in the follow up after 1 week and was categorized according to the Visual Analogue Score (VAS) from 1-10. This was then interpreted as 1-mild pain, 2- moderate pain and 3- severe pain. The average pain score in the open hemorrhoidectomy group was 2.55 + 0.80 and a mean score of pain in the semi-open hemorrhoidectomy was 1.82 + 0.85. The difference was statistically significant (p=0.06, 95% CI= 0.22 to 1.23).

The bleeding that was present after the procedure was recorded and 5 patients from Group 1 had bleeding, whereas 3 patients from Group 2 had bleeding and there was no statistical difference in bleeding between the two groups (p=0.43). Of the 44 patients who underwent the two different procedures, 6 (22) and 4(22), in group 1 and group 2 respectively, developed urinary retention. There was no statistical significance between the two groups (p= 0.47).

Narcotic analgesics were prescribed after the procedure and were ordered to use them as necessary when the patient was discharged. On the follow up during the first week the narcotic analgesic use was recorded and measured between the two groups. In the group where open hemorrhoidectomy was done 13 participants took a breakthrough narcotic analgesic for pain and only 2 patients from the semi-open hemorrhoidectomy, the group had taken breakthrough analgesics, this was statistically significant (p= 0.01).

One of the measured outcomes was wound healing in two weeks. At the second follow up at two weeks, the wound was inspected by the surgeon and noted. The patients who underwent open hemorrhoidectomy, only 4 had a healed wound on the fourteenth day but in the semi-open group, 20 patients had a healed wound, with a significant value of p= 0.04, 95% CI=0.23 to 0.76. On the second week follow up the patients were asked about the discomfort that they were still feeling. In the patients in group 1, 11 were still having some amount of discomfort at that time and only 4 patients had discomfort in the semi-open group (p=0.02).

Discussion

Hemorrhoid surgery is still one of the most frequent surgical procedure that is performed worldwide even with newer technologies providing alternative methods of treatment. Open hemorrhoidectomy and closed hemorrhoidectomy are the most widely used procedure and has gained much popularity. Open hemorrhoidectomy gives good results but is associated with various complications like bleeding, urine retention, stenosis, incontinence, infection, and post-operative pain.[11] Closed hemorrhoidectomy also has complications like open technique but the infection rate is bit lowered. [9] Many modifications to these techniques have been proposed and they try to decrease the complications rate as much as possible. One of the most troubling experience for the patient in the post-operative period is a pain. In this study, the patients who underwent a semi-open technique of hemorrhoidectomy experienced a lower intensity of pain as compared to patients who had an open hemorrhoidectomy. A study was done comparing the open vs semi-open hemorrhoidectomy, where pain score was not recorded but the use of the analgesic was more with open technique as compared to the semi-open one.[12] A study comparing open and closed hemorrhoidectomies concluded that pain in closed hemorrhoidectomy was less than in open.[13] The procedure used in this study, the modified semi-open technique, somewhat resembles the closed technique without closing the skin part. The distal part, where there are abundant nerve endings, if left without suturing helps to reduce the tension and can decrease the sphincter pressure. The use of narcotic analgesics has been a standard after peri-anal surgeries. As mentioned earlier, the use of the analgesic in a study comparing open vs semi-open technique has shown that open hemorrhoidectomy patients used more analgesics as compared to a semi-open hemorrhoidectomy.[12] In our study too, the use of narcotic analgesics was more, in the first week after the surgery, in the open method. This finding with the increased pain score shows that semi-open hemorrhoidectomy is relatively less painful and discomforting to the patient, as compared to open technique. In a study comparing open vs semi-closed hemorrhoidectomy, the pain score after 1 week was more severe in the semi-closed group, when the patient was of a young age with high sphincter pressure.[15] Here, we think that the applied sutures beyond the dentate line may have caused more stress and irritation causing extra sphincter tone. This semi-closed technique incorporated suturing of the skin beyond the dentate line but in our technique, the part distal to the dentate line was left open. This may be a cause of less irritation and pain to the patient in our study.

Bleeding after the procedure is one of the complications that can create serious patients' anxiety. The bleeding rate in open hemorrhoidectomy is reported to be 0.03-6%[11] but the bleeding rate after the semi-open technique has not been studied. In our study, postoperative bleeding was not different in both groups. Using a diathermy device and immaculate hemostasis has decreased the post-operative bleeding tendencies. Post-operative urine retention is one of the causes of distress to the patients. The risk factors for this are female sex, anesthesia method, three or more hemorrhoids resected and grade of hemorrhoids and a large volume of intravenous fluids in the perioperative period.[14] In our study, the postoperative urine retention was the same, as the anesthesia used was spinal in all cases, the gender distribution was equal, the grades and number of hemorrhoids were nearly even in both groups and the peri-operative fluid was standard in all.

One of the most consistent problems with open hemorrhoidectomy is the healing time. Hemorrhoidectomy done with the semi-open technique has a faster healing time as compared to open technique. The average healing time for semi-open hemorrhoidectomy was shown to be 12.38 days as compared to 25.22 days for open method.[12] In our study too, the operation wound in the semi-open method was nearly healed in most of the patients but in contrast, the wound in the open group was mostly, still healing. In the open technique, the edges are widely split and there is more open wound area to be covered by tissue than compared

to semi-open technique. The suturing of the proximal part can somewhat decrease the wide-open raw area in the part distal to the dentate line. Each time there is a stimulus, the sphincter complex tightens and blood supply is temporarily decreased. To decrease this phenomenon, botulinum toxin injection has been tried and this has improved the overall wound healing in the post-operative period.[16] Although this procedure can improve wound healing and decrease pain perception to the patient, it does not seem feasible in a developing country like ours. With the high pain index and non-healing operated site, the discomfort experienced by the patients is understandable. In spite of the little extra time needed for the semi-open method, the decrease in pain severity and the faster wound healing makes this technique worthwhile for the patients undergoing hemorrhoidectomy, until more advanced and newer techniques are widely available.

Conclusion

Semi-open hemorrhoidectomy has fewer post-operative complication rates as compared to open hemorrhoidectomy with decreased pain, faster wound healing rates, and lesser patient discomfort.

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