**ORIGINAL ARTICLE**

# Postoperative Complications Associated with Open Versus Closed Haemorrhoidectomy

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## ABSTRACT

**Objective:** was to compare the effectiveness of open and closed haemorrhoidectomy for 3rd and 4th degree prolapsing and complicated internal haemorrhoids in our local population in terms of postoperative complications .

**Study design*:*** Cross-sectional , comparative study .

**Materials and methods:** 80 patients were divided equally into two groups of 40 each : Group A and Group B . Patients in Group A were operated by the open haemorrhoidectomy technique while those in Group B were operated by the closed haemorrhoidectomy technique.

**Result:** At first follow up visit , wound healing was assessed to be incomplete in all the 80 patients ; pain was reported by 53 ( 66.3% ) patients in total; complain of bleeding was present in 24 (30.0%) patients in total; infection/sepsis was present in 41(51.3%) patients in total; urinary retention was reported by 19(23.8%) patients in total; fecal incontinence was present in 9(11.3%) patients in total; anal stenosis was exhibited by 43 (53.8%) patients; and recurrence was present in 3(3.8%) patients in total. At the second follow up visit, wound healing was assessed to be incomplete in 45(56.3%) patients; pain was present in 6(7.5%) patients only; complain of bleeding was present in 5(6.3%) patients only; infection/sepsis was seen in 17(21.3%) patients in total; urinary retention was reported by 2(2.5%) patients only; fecal incontinence was reported by 6(7.5%) patients in total; anal stenosis was present in 40(50.0%) patients; and recurrence was present in 6(7.5%) patients in total. At the third follow up visit, wound healing was assessed to be incomplete in 4(5.0%) patients only; pain was not present in any patient; complain of bleeding was presented by 6(7.5%) patients only; infection/sepsis of the surgical site was seen in 10(12.5%) patients in total; urinary retention was again not present in any of the patients; fecal incontinence was reported by 5(6.3%) patients only; anal stenosis was present in 22(27.5%) patients in total; and recurrence was exhibited by 7(8.8%) patients in total.

**Conclusion*:*** Both open and closed haemorrhoidectomy techniques were equally beneficial to the patient because they both showed an almost similar pattern of postoperative complications . Closed haemorrhoidectomy technique led to an earlier wound healing than the open technique . Chances of development of anal stenosis were relatively higher after a closed haemorrhoidectomy as compared to the open haemorrhoidectomy .

**Key words:** Open haemorrhoidectomy , closed haemorrhoidectomy

## INTRODUCTION

Haemorrhoids have been suggested to be the most frequent disorder in western countries[1,2]. In comparison to the Asian countries, incidence of occurrence of haemorrhoids is somewhat higher in Europeans because of their diet which is highly refined. Haemorrhoids can occur at any age, although they are rarely encountered below 20 years of age[3]. Haemorrhoids can affect both men and women. However, men are more frequently affected.

Surgical intervention in the form of haemorrhoidectomy is usually required for the third and fourth degree haemorrhoids[1,2]. For this, different haemorrhoidectomy techniques have been developed such as open and closed haemorrhoidectomy[5,7,3] submucosal haemorrhoidectomy[3]. stapling technique[7]. Doppler transducer guided ligation of the haemorrhoidal arteries[11] and electrotherapy of haemorrhoids[3]. Recent advances have led to the introduction of modified Ferguson haemorrhoidectomy and procedure for prolapse and haemorrhoids (PPH)[3].

Major complications associated with the haemorrhoidectomy procedure include postoperative pain, acute retention of urine, reactionary haemorrhage, secondary haemorrhage, anal stenosis, anal stricture and fecal incontinence due to sphincter injury. Recurrence of haemorrhoids is also a possibility.

For surgical excision for the third and fourth degree haemorrhoids, the most popular techniques are the open and closed haemorrhoidectomy . In the open technique, the anal mucosa and skin are left

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open to heal by secondary intention, whereas in the closed technique, the wound is sutured.

However, there is conflicting evidence on the effectiveness of both these procedures. A recent study carried out in Spain has shown that closed haemorrhoidectomy gives better results in terms of pain and healing than open haemorrhoidectomy[15]. On the other hand, a study carried out in Korea has reported that open haemorrhoidectomy for primary haemorrhoids combined with suture ligation for secondary haemorrhoids is the optimal approach considering its rapidity, simplicity and lower cost .

Therefore, the purpose of this study was to compare the effectiveness of open and closed haemorrhoidectomy for 3rd and 4th degree prolapsing and complicated internal haemorrhoids in our local population in terms of postoperative complications.

## MATERIALS AND METHODS

This cross-sectional, comparative study was carried out on 80 patients in the Department of General Surgery, Ibn-e-Sina Hospital, Multan Medical and Dental College, Multan for six months, from 1st March 2010 to 31st September 2010. It was non-probability, purposive sampling. The following patients were included in this study: Patients presenting with clinically diagnosed 3rd and 4th degree haemorrhoids. Patients of both sexes with age more than 15 years. Patients presenting with any of the following findings were excluded from the study: Patients who did not give consent for participation in the study, Patients with recurrent haemorrhoids after treatment, patients with inflammatory bowel disease (Crohn's disease), patients with systemic illness (e.g. portal hypertension due to chronic liver disease), patients with any bleeding disorder (e.g. hemophilia) and patients with cancerous disease (e.g. carcinoma colon, leukemia, lymphoma).

Eighty patients, who presented with the complaint of bleeding per rectum in the Out Patients Department and Surgical Ward, Ibn-e-Sina Hospital, Multan, were included in this study according to the selection criteria mentioned above. Prior to the study, proper permission was taken from the Institutional Ethical Review Committee to conduct the study.

The Microsoft Excel 2003 software was used to randomly divide 80 numbers into two groups of 40 each. These groups were later on labeled as Group A and Group B, which formulated our study groups. The patients were given a specific number in the order they reported to us for treatment purposes. The patients included in Group A were operated by the open technique while those included in Group B were operated by the closed technique. An informed consent was obtained from all the patients informing them the procedure of the study and the fact that there was no risk involved for participation in the study. They were also ensured about their confidentiality.

## RESULTS

A total of 80 patients were included in this study. Among them ,males n = 50 (62.5% ), SD $\pm$12.24 , Age range 21 - 68 years, mean = 46.06 years and Females n = 30 (37.5%), SD$\pm$11.28 , Age range 23 – 56 , mean age = 43.93 years .

The patients were divided equally into two groups of 40 each: Group A and Group B. Patients in Group A were operated by the open haemorrhoidectomy technique while those in Group B were operated by the closed haemorrhoidectomy technique. Out of the 40 patients included in Group A, 25 (62.5%) were males while 15 (37.5%) were females. The patients in this group ranged in age from 32 years up to 66 years. The mean age for Group A patients was 49.30 years and standard deviation was 9.62. The study was highly significant ($P<0.05$) when wound healing and anal stenosis on the second follow up visit were correlated in both groups. Our study was also significant ($P<0.05$) when recurrence on first follow up visit was correlated in both study groups.

Table 1: Distribution of patients according to gender and mode of admission (n=80)

| Gender of Patients | Mode of admission | | | | Total | %age |
|---|---|---|---|---|---|---|
| | OPD | %age | Ward | %age | | |
| Male | 36 | 65.5% | 14 | 56.0% | 50 | 62.5 |
| Female | 19 | 34.5% | 11 | 44.0% | 30 | 37.5 |
| Total | 55 | 100.0% | 25 | 100.0% | 80 | 100. |

Table 2: Comparison of Wound Healing in Follow-up Visits(n=80)

| Follow-up Visit | Wound Healing | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Complete | - | - | - | - | - | - |
| | Incomplete | 40 | 50.0 | 40 | 50.0 | 80 | 100.0 |
| Second | Complete | 10 | 25.0 | 25 | 62.5 | 35 | 43.8 |
| | Incomplete | 30 | 75.0 | 15 | 37.5 | 45 | 56.3 |
| Third | Complete | 37 | 92.5 | 39 | 97.5 | 76 | 95.0 |
| | Incomplete | 3 | 7.5 | 1 | 2.5 | 4 | 5.0 |

Table 3: Comparison of Pain in Follow-up Visits(n=80)

| Follow-up Visit | Pain | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 25 | 62.5 | 28 | 70.0 | 53 | 66.3 |
| | Absent | 15 | 37.5 | 12 | 30.0 | 27 | 33.8 |
| Second | Present | 4 | 10.0 | 2 | 5.0 | 6 | 7.5 |
| | Absent | 36 | 90.0 | 38 | 95.0 | 74 | 92.5 |
| Third | Present | - | - | - | - | - | - |
| | Absent | 40 | 100.0 | 40 | 100.0 | 80 | 100.0 |

Table 4: Comparison of Bleeding in Follow-up Visits (n=80)

| Follow-up Visit | Bleeding | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 12 | 30.0 | 12 | 30.0 | 24 | 30.0 |
| | Absent | 28 | 70.0 | 28 | 70.0 | 56 | 70.0 |
| Second | Present | 4 | 10.0 | 1 | 2.5 | 5 | 6.3 |
| | Absent | 36 | 90.0 | 39 | 97.5 | 75 | 93.8 |
| Third | Present | 4 | 10.0 | 2 | 5.0 | 6 | 7.5 |
| | Absent | 36 | 90.0 | 38 | 95.0 | 74 | 92.5 |

Table 5: Comparison of Infection/Sepsis in follow-up visits (n=80)

| Follow-up Visit | Infection or Sepsis | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 17 | 42.5 | 24 | 60.0 | 41 | 51.3 |
| | Absent | 23 | 57.5 | 16 | 40.0 | 39 | 48.8 |
| Second | Present | 9 | 22.5 | 8 | 20.0 | 17 | 21.3 |
| | Absent | 31 | 77.5 | 32 | 80.0 | 63 | 78.8 |
| Third | Present | 5 | 12.5 | 5 | 12.5 | 10 | 12.5 |
| | Absent | 35 | 87.5 | 35 | 87.5 | 70 | 87.5 |

Table 6: Comparison of Urinary Retention in Follow-up Visits (n=80)

| Follow-up Visit | Urinary Retention | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 7 | 17.5 | 12 | 30.0 | 19 | 23.8 |
| | Absent | 33 | 82.5 | 28 | 70.0 | 61 | 76.3 |
| Second | Present | 2 | 5.0 | - | - | 2 | 2.5 |
| | Absent | 38 | 95.0 | 40 | 100.0 | 78 | 97.5 |
| Third | Present | - | - | - | - | - | - |
| | Absent | 40 | 100.0 | 40 | 100.0 | 80 | 100.0 |

Table 7: Comparison of Fecal Incontinence in Follow-up Visits (n=80)

| Follow-up Visit | Fecal Incontinence | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 3 | 7.5 | 6 | 15.0 | 9 | 11.3 |
| | Absent | 37 | 92.5 | 34 | 85.0 | 71 | 88.8 |
| Second | Present | 2 | 5.0 | 4 | 10.0 | 6 | 7.5 |
| | Absent | 38 | 95.0 | 36 | 90.0 | 74 | 92.5 |
| Third | Present | 2 | 5.0 | 3 | 7.5 | 5 | 6.3 |
| | Absent | 38 | 95.0 | 37 | 92.5 | 75 | 93.8 |

Table 8: Comparison of Anal Stenosis in Follow-up Visits(n=80)

| Follow-up Visit | Anal Stenosis | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 20 | 50.0 | 23 | 57.5 | 43 | 53.8 |
| | Absent | 20 | 50.0 | 17 | 42.5 | 37 | 46.3 |
| Second | Present | 16 | 40.0 | 24 | 60.0 | 40 | 50.0 |
| | Absent | 24 | 60.0 | 16 | 40.0 | 40 | 50.0 |
| Third | Present | 8 | 20.0 | 14 | 35.0 | 22 | 27.5 |
| | Absent | 32 | 80.0 | 26 | 65.0 | 58 | 72.5 |

Table 9: Comparison of Recurrence in Follow-up Visits(n=80)

| Follow-up Visit | Recurrence | Study Groups | | | | Total | %age |
|---|---|---|---|---|---|---|---|
| | | Group A | %age | Group B | %age | | |
| First | Present | 3 | 7.5 | - | - | 3 | 3.8 |
| | Absent | 37 | 92.5 | 40 | 100.0 | 77 | 96.3 |
| Second | Present | 4 | 10.0 | 2 | 5.0 | 6 | 7.5 |
| | Absent | 36 | 90.0 | 38 | 95.0 | 74 | 92.5 |
| Third | Present | 4 | 10.0 | 3 | 7.5 | 7 | 8.8 |
| | Absent | 36 | 90.0 | 37 | 92.5 | 73 | 91.3 |

## DISCUSSION

The present study evaluated and compared the postoperative complications reported by patients who were operated by the open and closed haemorrhoidectomy techniques. Our null hypothesis was partially supported and partially refuted because of the mixed results obtained. On one hand, we were able to establish a statistically significant difference between the two techniques in terms of wound healing, development of anal stenosis and recurrence. However, on the other hand, when we considered the other postoperative complications i.e., pain, bleeding, infection/sepsis, urinary retention and fecal incontinence, no statistically significant difference was found between the two operative techniques used in this study.

Milligan-Morgan's open haemorrhoidectomy is most commonly used and is widely considered to be the most effective surgical technique for treating haemorrhoids. On the other hand, Ferguson's closed haemorrhoidectomy results in very low rates of perioperative morbidity. Long-term results have demonstrated high patient satisfaction and low incontinence and reoperation rates. It could be the gold standard to which other techniques could be compared[16]. Hence, we took up a comparison of these two techniques in terms of postoperative complications in the present study.

Regarding the other postoperative complications studied, no significant association was found between both operative techniques in terms of pain, bleeding, infection/sepsis, urinary retention and fecal incontinence during the follow up visits. This further strengthens our belief that both open and closed haemorrhoidectomy procedures are equally successful in delivering quality treatment to patients suffering from this problem.

Our findings were in line with a number of other studies on the subject. In a local study carried out by Shoaib et al[2], both open and closed techniques were found to be efficient in treating third degree haemorrhoids. It was also seen that complete wound healing took longer for the open haemorrhoidectomy technique whereas recurrence rate was 4.0% after one year. We also found the same trend in wound healing but recurrence rate was higher, up to 8.8% at the end of our study.

Similar results have been reported by Rafiq and Scott . They also concluded that both methods were fairly efficient treatment for haemorrhoids. Closed haemorrhoidectomy led to faster wound healing, similar to our results. They reported a recurrence rate of more than 8.0%, which is also very similar to our own findings.

In another study by Malik et al[2], wound healing was found to occur in 1 to 2 weeks after a submucosal closed haemorrhoidectomy as compared to 6 to 8 weeks after the open haemorrhoidectomy. They have favoured the submucosal technique over the open technique due to better overall results of the former. We also found the same trend of delayed wound healing for patients operated by the open technique.

In a study carried out by Uba and colleagues on open versus closed haemorrhoidectomy for the 3rd and 4th degree haemorrhoids, it was observed that there was no statistical difference between these two techniques. However, wound healing was significantly faster in patients who were operated upon by closed haemorrhoidectomy, similar to our own findings.

Ho and Buettner compared open and closed haemorrhoidectomy through a meta-analysis. They concluded that, apart from faster wound healing after closed haemorrhoidectomy, both the techniques were equally safe and effective, with no statistical difference between the two techniques in terms of duration of hospital stay, intensity of pain and development of other complications. Our study also revealed similar results, with no differences observed between the two techniques regarding various postoperative complications except for wound healing and anal stenosis. Similar results have been reported by Arbman et al from Sweden. They have suggested both methods to be fairly efficient in the treatment of hemorrhoids without any serious drawbacks.

In their study, Arroyo et al treated symptomatic haemorrhoids as day care surgery using open and closed haemorrhoidectomy techniques. They found that closed haemorrhoidectomy gave better results in terms of pain and healing as compared to the open technique, whereas recurrence and other complications were similar after 1 year.

Guenin et al studied the long-term results and patient satisfaction after a Ferguson's closed haemorrhoidectomy. Long-term results demonstrated a high patient satisfaction and a low incontinence and reoperation rate. In our study, we also found that closed haemorrhoidectomy yielded better long-term results in terms of wound healing, postoperative bleeding, pain, infection/sepsis, urinary retention and recurrence. However, in our study, higher incidence of fecal incontinence and anal stenosis was noted with the closed technique as compared with the open technique.

In contrast to the above-mentioned study, Khubchandani IT[21]. concluded that the open haemorrhoidectomy was more comfortable to the patients because, in comparison to the closed

technique, it was less painful, with lesser recurrence rate, although healing time was shorter in the closed technique. Our study also supports these findings in that the pain on first follow up visit was recorded for 25(62.5%) patients operated by the open technique as compared to 28 (70.0%) patients operated by the closed technique.

In another study carried out by Gencosmanoglu and colleagues[3], it was concluded that although the healing time was longer, the open technique was advantageous with respect to shorter operating time, lesser discomfort in the early postoperative period and a lower morbidity rate. These findings are in accordance to our own results in that healing took longer for patients operated by the open technique, and comparatively less patients presented with postoperative pain on the first follow up visit. The chances of developing anal stenosis were also less in these patients.

In their study, Islam and colleagues[5] undertook second and third degree haemorrhoids, with the open and closed haemorrhoidectomy procedures. They found no statistical difference in the operative procedures with respect to pain or wound healing. They also did not report any recurrence. These findings could be related to the fact that they included patients with uncomplicated haemorrhoids only whereas we included complicated haemorrhoids as well, which could have resulted in different findings noted in our study.

Johannsson and colleagues[3] carried out randomized clinical trials on the effects of Milligan-Morgan and Ferguson's techniques on anal function. They concluded that the closed Ferguson haemorrhoidectomy was superior to the open Milligan-Morgan procedure in terms of long-term anal continence and patient satisfaction. Their findings are contradictory to our results as far as anal stenosis and fecal incontinence are concerned.

In a recent modification of the Milligan-Morgan haemorrhoidectomy, Capizzi et al[2] have used radiofrequency ablation for removal of haemorrhoids with the help of Ligasure with immediate discharge of the patient. They have obtained superior results with this modified technique as compared to the conventional technique used in the present study. In another study carried out by Carditello and Stilo, the Ligasure radiofrequency coagulator was used in Ferguson haemorrhoidectomy. They obtained superior results with this modified Ferguson technique in comparison to the classical approach, thereby making this technique feasible and accurate for almost all patients, with both a considerable reduction in costs and enhanced patient comfort and compliance.

Studies by Mehigan et al[10] and Rowsell et al[11] have suggested that stapled haemorrhoidectomy is also an effective treatment, reducing postoperative pain, the length of hospital stay, and encouraging a rapid return to normal activities when compared with conventional haemorrhoidectomy. This technique may cause a full thickness excision of the rectal wall and injuries to the anal sphincter, and it does not allow for the treatment of concomitant anal disease[2]. Stapled haemorrhoidectomy has been associated with life threatening sepsis and even mortality as reported by Cirocco WC[12], which further supported our view of not selecting this technique for the present study.

A study carried out by Gao et al[12] has compared results of PPH with the Milligan-Morgan technique. They found that long-term efficacies of both procedures in the treatment of 3rd and 4th degree internal hemorrhoids were similar. However, PPH had better safety, lesser complications and lesser effect on abnormal function of defecation as compared with the open technique. In the present study, we also found that the overall complication rate was lower in closed haemorrhoidectomy as compared to the open technique.

## CONCLUSION

Within the limitations of this study, the following conclusions were drawn:

1. Both open and closed haemorrhoidectomy techniques were equally beneficial to the patient because they both showed an almost similar pattern of postoperative complications.
2. Closed haemorrhoidectomy technique led to an earlier wound healing than the open technique.
3. Chances of development of anal stenosis were relatively higher after a closed haemorrhoidectomy as compared to the open haemorrhoidectomy.

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