ORIGINAL ARTICLE

Role of Internal Sphincterotomy as an Adjunct to Open Haemorrhoidectomy for Management of Third- and Fourth-Degree Haemorrhoids

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ABSTRACT

***Background and Objective*:** Post-operative pain and complications are common after open haemorrhoidectomy. Addition of internal sphincterotomy has shown to improve the post-operative outcomes. This study is conducted to compare the outcomes of open haemorrhoidectomy with and without internal sphincterotomy.

Methods: A prospective randomized controlled trial was conducted in the Department of Surgery at Sargodha Medical College/District Headquarter Hospital, Sargodha from February 2016 to December 2017. One hundred and twenty-two patients presenting with third and fourth degree haemorrhoids were divided in two equal groups. In group "A", haemorrhoidectomy with internal sphincterotomy and in group "B", haemorrhoidectomy alone was performed. Outcome variables such as pain scores based on Verbal Rating Scales (VRS), hospital stay, complications and wound healing were compared in both groups.

Results: The mean pain scores were less in the internal sphincterotomy group A i.e., 3.3 ± 0.3 while it was 3.6 ± 0.4 in group B at 1st post-op day. The mean duration of hospital stay was less in group A (2.3 ± 0.7 days) and it was 3.4 ± 0.9 days in group B. On the 7th post-operative day, 13 (21.3%) patients in group A and 4 (6.6%) patients in group B had flatus incontinence. Urinary retention was present in 4 (6.6%) cases in group A and 13 (21.3%) in group B. Post-operative bleeding was present in 44 (72.1%) cases of group A and 41 (67.2%) of group B. Constipation was higher in the group B (44.3% vs. 37.7%). Wound healing was better in group A (63.3%). Anal stenosis occurred in 3 (4.9%) patients who were treated with haemorrhoidectomy alone.

Conclusion: Addition of internal sphincterotomy improves the outcome of open haemorrhoidectomy in patients of third- and fourth-degree haemorrhoids. It is therefore recommended to carryout internal sphincterotomy when operating on such patients.

KEYWORDS: Haemorrhoids, Haemorrhoidectomy, Lateral internal sphincterotomy, Postoperative complications.

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INTRODUCTION

Haemorrhoids, commonly known as piles, are the engorgement and prolapse of anal cushions. Piles is one of the most common presentations in the surgical outdoor and it is estimated that almost half of the population above fifty years of age suffer from this condition.[1] Haemorrhoids are the leading cause of lower gastrointestinal bleeding and associated with morbidity and compromised quality of life.[2] The exact incidence of this disease in our population is not very well known as most of the patients present very late.

Goligher has classified haemorrhoids into four degrees.[3] Although variable success rates of non-surgical management has been reported but surgical treatment is usually preferred for the third and fourth degree haemorrhoids.[4] Different surgical options include stapled haemorrhoidectomy, trans-anal hemorrhoidal dearterialization, open (Milligan-Morgan) or closed (Ferguson) haemorrhoidectomy and haemorrhoidectomy using ligature or harmonic scalpel.[5] Hemorrhoid surgery is often associated with complications which include post-operative pain, bleeding, urinary retention, wound infection, fecal incontinence, constipation or anal stenosis.[6]

Internal sphincterotomy can relax the internal anal sphincter, therefore, reducing post-operative pain and spasm associated with haemorrhoidectomy. It is, therefore, often combined with haemorrhoidectomy to provide post-operative pain relief.[7] It is evident that addition of internal sphincterotomy can reduce the incidence of post-operative complications.[8] The current study is therefore designed to compare the outcomes of open haemorrhoidectomy with and without internal sphincterotomy.

METHODS

A prospective randomized controlled trial was conducted in the Department of Surgery at Sargodha Medical College/District Headquarter Hospital, Sargodha over a twenty-two months period from February 2016 to December 2017. Patients of both genders, aged 20 to 80 years of age and presenting with third or fourth degree haemorrhoids were included in the study. Previously operated cases, patients with co-existing fissure or other anal pathologies and loss to follow-up cases were excluded. Non-probability consecutive sampling technique was used and one hundred and twenty-two cases fulfilling the inclusion criteria were included after taking informed consent.

Ethical approval for the study was taken from Institutional Ethical Review Board vide Letter No.2549/SMCTH/DHQ dated 27-02-2020. Patients were randomly divided in two equal groups of 61 patients each by lottery method. In group "A", patients underwent haemorrhoidectomy with lateral sphincterotomy and in group "B", haemorrhoidectomy alone was performed. All patients were given enema a night before and in the morning of the surgery. Prophylactic antibiotics including injectable Ciprofloxacin and Metronidazole were given half an hour before the induction of anesthesia. All the procedures were performed by the qualified surgeons. The surgeries were performed in general anesthesia or saddle block. The sub-mucosal plane was infiltrated with Adrenalin (1:300,000) to minimize bleeding. An open haemorrhoidectomy (Milligan-Morgan) was performed in both groups. In group A, after haemorrhoidectomy, the pearly white internal sphincter was identified and its lower one-third part was held in the artery forceps and cut up to the Dentine line.

Post-operatively, anal canal was packed with gauze pieces. Post-operative analgesia was provided by Diclofenac Sodium, 75 mg twice daily through intra-muscular route. Stool softeners (bulk forming) were given to all patients. Sitz bath with lukewarm water were started on the first post-operative day and continued twice daily for two weeks. The antibiotics ciprofloxacin and metronidazole were continued orally for five days and NSAIDs were given post-operatively for pain

relief.

Pain scores were assessed through Verbal Rating Scales (VRS) from 0 to 10. Where "0" meant no pain and "10" was maximum pain. Patients were discharged when pain was ≤ 3/10, patient was able to pass stool and dressing was mildly soaked. The patients were followed in the OPD on 3rd, 7th, 14th day, after one month and after 3 months. Wound healing was labelled when epithelial coverage had reached more than 90%, which was assessed subjectively at follow-ups. Anal stenosis was assessed as narrowing of anal canal.

STATISTICAL ANALYSIS

Data were collected on pre-designed proformas and analyzed by using Statistical Package for Social Sciences (SPSS) version 21. Pain scores and hospital stay were presented as mean ± SD and complication and wound healing as frequency and percentages. T-test was applied to compare mean values among both groups and frequencies were compared by Chi-square test. P-value ≤ 0.05 was considered significant.

RESULTS

A total of 122 patients of third or fourth degree haemorrhoids were included in the study. Out of these, 73 (59.8%) were males and 49 (40.2%) were females. The mean age of all the study participants was 37.7 ± 4.3 years (Range 20 to 80 years). In group "A" internal sphincterotomy was combined with open haemorrhoidectomy and in group "B" only open haemorrhoidectomy was performed.

The mean pain scores on VRS scale (3.3 ± 0.3 and 3.5 ± 0.5) were less in group A while comparing to group B (3.6 ± 0.4 and 4.0 ± 0.6) at 1st post-op day and 3rd post-op day respectively. The mean duration of hospital stay in group A was 2.3 ± 0.7 days and 3.4 ± 0.9 days in group B. Although pain scores and hospital stay were considerably less in group A, the differences, however, were not statistically significant (P>0.05) (Table-1).

Flatus incontinence was more in sphincterotomy group A as compared to group without sphincterotomy group B. On the 7th post-operative day, 13 (21.3%) patients in group A and 4 (6.6%) patients in group B had flatus incontinence. The flatus incontinence had resolved in all the patients by the end of three months. At, the 7th post-operative day, 17 (27.9%) patients in group A and 8 (13.1%) in group B had fecal soiling. At the end of three months, no one had fecal soiling. Urinary retention was higher in the group where haemorrhoidectomy alone was performed. It was present in 4 (6.6%) patients in group A and 13 (21.3%) in group B, at the 7th post-operative day. None of the patient reported urinary retention by the end of three months.

Table-1: Comparison of post-operative pain scores and hospital stay in both study groups.

Follow-up	Group A Haemorrhoidectomy + Internal Sphincterotomy (N = 61)	Group B Haemorrhoidectomy Alone (N = 61)	P-value
Post-Operative Pain Scores (VRS)			
1st post-op day	3.3 ± 0.3	3.6 ± 0.4	0.507
3rd post-op day	3.5 ± 0.5	4.0 ± 0.6	0.384
7th post-op day	3.3 ± 0.4	3.7 ± 0.5	0.433
1 month	1.6 ± 0.3	2.3 ± 0.6	0.172
3 months	1.2 ± 0.3	1.8 ± 0.4	0.078
Mean Hospital stay (days)			
Mean Hospital stay	2.3 ± 0.7	3.4 ± 0.9	0.089

Post-operative bleeding was higher in group A as 44 (72.1%) patients while comparing to 41 (67.2%) patients in group B, at the 7th post-operative day. After one month of surgery, 12 (19.7%) patients in group A and 8 (13.1%) in group B and after three months, only 2 (3.3%) patients in group A and 1 (1.6%) in group B were reported for bleeding. However, in all these patients the bleeding was mild and no intervention was required. Constipation was higher in the group B (44.3% at 7th post-operative day) where haemorrhoidectomy alone was performed. At, three months follow-up 11 (18.0%) patients in group B and 8 (13.1%) in group A reported constipation and they treated with stool softeners (Table-2).

Wound healing appeared to be better in group A, in which at the end of first month, 38 (63.3%) patients and at the end of third month, 55 (90.1%) patients had complete healing. In group B, there were 24 (39.3%) patients with complete healing at the end of first month and 50 (81.2%) at the end of

Table-2: Comparison of various post-operative complications in both study groups.

Follow-up	Group A Haemorrhoidectomy + Internal Sphincterotomy (N = 61) n (%)	Group B Haemorrhoidectomy Alone (N = 61) n (%)	P-value
Flatus Incontinence			
7th post-op day	13 (21.3%)	4 (6.6%)	0.104
1 month	4 (6.6%)	2 (3.3%)	0.177
3 months	0 (0%)	0 (0%)	0.213
Fecal Soiling			
7th post-op day	17 (27.9%)	8 (13.1%)	0.072
1 month	4 (6.6%)	3 (4.9%)	0.119
3 months	0 (0%)	0 (0%)	0.342
Urinary Retention			
7th post-op day	4 (6.6%)	13 (21.3%)	0.066
1 month	1 (1.6%)	2 (3.3%)	0.083
3 months	0 (0%)	0 (0%)	0.117
Post-operative Bleeding			
7th post-op day	44 (72.1%)	41(67.2%)	0.149
1 month	12 (19.7%)	8 (13.1%)	0.155
3 months	2 (3.3%)	1 (1.6%)	0.207
Constipation			
7th post-op day	23 (37.7%)	27 (44.3%)	0.166
1 month	16 (26.2%)	19 (31.1%)	0.195
3 months	8 (13.1%)	11 (18.0%)	0.208

third month. Anal stenosis did not occur in the group treated with combination of haemorrhoidectomy and sphincterotomy but occurred in 3 (4.9%) patients who were treated with haemorrhoidectomy alone. The patients with anal stenosis were treated with serial dilatations with anal dilators (Table-3).

Table-3: Comparison of wound healing and anal stenosis in patients in both groups.

Follow-up	Group A Haemorrhoidectomy +Internal Sphincterotomy (N = 61) n (%)	Group B Haemorrhoidectomy Alone (N = 61) n (%)	P-value
Wound Healing			
1 month	38 (62.3%)	24 (39.3%)	0.065
3 months	55 (90.1%)	50 (81.2%)	0.098
Anal Stenosis			
1 month	0 (0%)	0 (0%)	0.244
3 months	0 (0%)	3 (4.9%)	0.087

Test of significance were applied to find the association of the treatment groups with the study outcomes. Results from independent sample T-test show that although there was a difference in mean pain scores and hospital stay but the results were not statistically significant (P > 0.05) (Table-1). Similarly, chi-square test was applied to study the effect of treatment group on the incidence of various complications and outcomes and the results were not statistically significant (P > 0.05) (Table 2&3).

DISCUSSION

The results from current study show that majority (almost 60%) of the patients were males and the mean age shows predilection towards middle age. Previous studies have also shown male predisposition.[9] The reason may be attributed to the fact that, in our part of the world, males are more independent and mobile and therefore have better access to health-care facilities and are more likely to seek medical treatment.[10] Other reasons for higher incidence in middle aged males are probably stress related and dietary habits such as low-fiber diet which may lead to constipation, a well-known cause for development of haemorrhoids.[11,12] Contrary to this, one local study concluded that there is no gender predilection for development of hemorrhoid and the only reason for higher incidence in males is the higher chances of them presenting to hospital.[13]

The results from present study clearly indicate that addition of internal sphincterotomy to open haemorrhoidectomy reduces the post-operative pain. Meta-analysis based on multiple trials, spanning over a period of decade, have proven the role of sphincterotomy in reducing post-operative pain and analgesic requirements.[14]In one local study, post-operative pain relief was present in twice as many patients having sphincterotomy while comparing with haemorrhoidectomy alone.[13] The reason for pain following haemorrhoidectomy is believed to be due to the increased anal pressure caused by the persistent spasm of the internal anal sphincter. This idea was initially proposed by Dr. Stephen Eisenhammer, who stressed the usefulness of internal sphincterotomy for the post-operative pain relief after haemorrhoidectomy.[15]

Use of chemical sphincterotomy such as topical application of nitroglycerine or diltiazem, a calcium channel blockers has also been advocated.[16,17]

However, chemical sphincterotomy is less effective as it is largely dependent on the skin and wound condition for its absorption.[18,19] In the current study, internal sphincterotomy was shown to reduce the hospital stay. This is essentially due to the above-mentioned reasons, where a relaxed sphincter results in lesser post-operative pain and analgesia requirement and subsequently shorter hospital stay.[20] Addition of internal sphincterotomy, not only to haemorrhoidectomy, but also to other anal procedures results in reduced analgesic costs and burden on healthcare facilities.[21]

Pain related complications such as constipation and urinary retention were higher in the patients treated without sphincterotomy. Bleeding and incontinence symptoms such as fecal soiling and flatus incontinence were higher in other group of patients in which sphincterotomy was performed. Similar results were observed in other Pakistani study.[22] It has been recommended that chances of sphincter damage are higher, therefore sphincterotomy must only be done in younger patients with better sphincter tone. [22] The anal tone tends to improve in the subsequent weeks post-operatively.[23]

Sphincterotomy can reduce the spasm and therefore improve the blood supply and healing of the tissue after haemorrhoidectomy.[24] Anal stenosis, although rare, can occur after haemorrhoidectomy. In present study, three patients in the group without sphincterotomy had anal stenosis, which was managed by serial dilatations. In a local study, as high as 13% patients were reported to have some degree of stenosis.[25] Anal stenosis can occur due to more than sufficient excision of hemorrhoidal tissue and should be regarded as a technical failure.[25] The post-operative outcomes were considerably better in the internal sphincterotomy group. Local and international literature also supports current findings. The differences observed in current study were not statistically significant (P>0.05). The authors believe that a possible explanation to this may be a relatively smaller sample size and recommend studies on a larger cohort to provide more local evidence in this regard.[26] Haemorrhoids surgery is continuously evolving with recent advances, nevertheless, open haemorrhoidectomy is still largely practiced in our setup. Addition of internal sphincterotomy can be invaluable in improving the outcome of this procedure.

CONCLUSION

Based on the results of present study and available literature, it may be concluded that addition of internal sphincterotomy to open haemorrhoidectomy can result in less post-operative pain and complications. Haemorrhoids is one of the most common surgical presentations in our setup. The addition of internal sphincterotomy can reduce the overall costs and burden on the healthcare facilities.

LIMITATION OF STUDY

The limitation of this study is the small sample size. A series of future studies are recommended with larger sample size in order to establish significant correlations among different parameters.

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CONFLICT OF INTEREST

None to declare.

FINANCIAL DISCLOSURE

None to disclose.

REFERENCES

1. Sandler RS, Peery AF. Rethinking what we know about haemorrhoids. Clin Gastroenterol Hepato. 2019; 17 (1): 8-15.
2. Ray Offor E, Amadi S. Hemorrhoidal disease: Predilection sites, pattern of presentation, and treatment. Ann Afr Med. 2019; 18 (1): 12-16.
3. Goligher JC. Surgery of the anus rectum and colon 4th ed. London: Bailliere Tindall. 1980.
4. Mannan A, Maheshwari TC, Soomro SA. Successful non-surgical management of all degree haemorrhoids. Int J Surg. 2017; 4 (11): 3590-3.

5. Ghieth SM, Elbahraw HA, Kassem MI, Sabry AA. Comparative study between harmonic scalpel and diathermy in the surgical treatment of grade III and IV haemorrhoids. Acta Sci Gastron Disord. 2019; 2 (10): 10-3.
6. Ali M, Nasir S, Nazir S, Shehbaz L, Saad M, Anwar MA, et al. Postoperative complications of haemorrhoidectomy, a comparative analysis of open versus closed operating. Pak J Surg. 2016; 32 (1): 26-8.
7. Singh R, Reddy TR, Kumar TS. A comparative study of open (Milligan-Morgan) versus closed (Ferguson) haemorrhoidectomy with and without internal sphincterotomy. Int Surg J. 2019; 6 (2): 443-6.
8. Emile SH, Youssef M, Elfeki H, Thabet W, El-Hamed TM, Farid M. Literature review of the role of lateral internal sphincterotomy (LIS) when combined with excisional haemorrhoidectomy. Int J Colorectal Dis. 2016; 31 (7): 1261-72.
9. Jamal A. Assessment of 135 cases of haemorrhoids reported to general surgery department: A clinical study. Int J Surg. 2019; 3 (3): 125-7.
10. Jain M, Baijal R, Srinivas M, Venkataraman J. Clinical predictors and gender-wise variations in dyssynergic defecation disorders. Indian J Gastroenterol. 2018; 37 (3): 255-60.
11. Ravindranath GG, Rahul BG. Prevalence and risk factors of haemorrhoids: a study in a semi-urban centre. Int Surg J. 2018; 5 (2): 496-9.
12. Garg P, Singh P. Adequate dietary fiber supplement and TONE can help avoid surgery in most patients with advanced haemorrhoids. Minerva Gastro Enteral Dietol. 2017; 63 (2): 92-6.
13. Farooq AS, Ahmed S, Javed MR, Rizwan S, Asif M, Khan RH. Haemorrhoidectomy with and without lateral internal sphincterotomy in terms of post-operative pain relief. Ann Punjab Med. 2019; 13 (4): 283-6.
14. Wang WG, Lu WZ, Yang CM, Yu KQ, He HB. Effect of lateral internal sphincterotomy in patients undergoing excisional haemorrhoidectomy. Medicine. 2018; 97 (32): e11820.
15. Eisenhammer S. Internal anal sphincterotomy plus free dilatation versus anal stretch with special criticism of the anal stretch procedure for haemorrhoids: The recommended modern approach to hemorrhoid treatment. Dis Colon Rectum. 1974; 17 (4): 493-522.
16. Khan KI, Waqas A, Akmal M, Mahmood S, Iqbal A. Efficacy of combination of 0.2% GTN and lignocaine ointments in wound healing and pain relief after Milligan Morgan haemorrhoidectomy–a comparison with lignocaine and 0.2% GTN ointments separately. Int J Surg. 2014; 12 (4): 329-33.
17. Aslam R, Ahmad ZS, Nayab IT, Khan A, Khan MF, Hussain F. Role of post-op topical diltiazem cream in pain control after Milligan-Morgan haemorrhoidectomy. KJMS. 2017; 10 (3): 381-5.
18. Chauhan A, Tiwari S, Mishra VK, Bhatia PK. Comparison of internal sphincterotomy with topical diltiazem for post-haemorrhoidectomy pain relief: a prospective randomized trial. J Postgrad Medicine. 2009; 55 (1): 22-7.
19. Rodríguez-Wong U, Ocharán-Hernández ME, Toscano-Garibay J. Topical diltiazem for pain after closed haemorrhoidectomy. Rev Gastroenterol Méx. 2016; 81 (2): 74-9.
20. Fernandes AM, Tauro LF. An evaluation of postoperative pain relief in open haemorrhoidectomy with and without lateral sphincterotomy. Saudi Surg J. 2016; 4 (1): 1-6.
21. Robinson K, Duncan SG, Messaris E, Brat G. Anorectal disease and post-discharge consumption of opioids. J Am Coll Surg. 2019; 229 (4): 51-2.
22. Hashmi MT, Ali MZ. Efficacy and safety of haemorrhidectomy alone and haemorrhoidectomy plus lateral internal sphincterotomy for management of 3rd and 4th degree haemorrhoids. Pak Armed Forces Med J. 2020; 70 (1): S106-12.
23. Alper D, Ram E, Stein GY, Dreznik Z. Resting anal pressure following haemorrhoidectomy and lateral sphincterotomy. Dis Colon Rectum. 2005; 48 (11): 2080-4.
24. Yang Tan K. Excision haemorrhoidectomy: new methods to improve the outcomes of an old technique. Jentashapir J Health Res. 2016; 7 (3): e34119.
25. Taha SA. Routine internal sphincterotomy with haemorrhoidectomy for third and fourth degree haemorrhoids greatly improves the outcome. IJGE. 2013; 1 (1): 48-51.
26. Mudge JF, Houlahan JE. Optimal sample size calculation for null hypothesis significance tests. BioRxiv. 2019:540468. [Epub ahead of print].

Author's Contribution

WSA: Conception and design of study, data interpretation, Drafting of manuscript.
RF: Data analysis and interpretation.
AH, YM, SA, HMSJ, GMA: Acquisition of data and drafting of manuscript with critical revision for intellectual content.
ALL AUHTORS: Final approval of the version to be published.