

ORIGINAL RESEARCH

Effect of internal sphincterotomy on postoperative pain in patients undergoing hemorrhoidectomy at tertiary care centre

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ABSTRACT

Background: Hemorrhoids are a common condition that presents with bleeding per rectum, pain at rest and defecation, mucosal discharge, and prolapse. Surgical Hemorrhoidectomy is the treatment method of choice for Grade 3 and Grade 4 hemorrhoids. Hemorrhoidectomy is associated with postoperative pain and no single surgical technique has been proved to significantly reduce the pain. We analyzed in our study the effect partial lateral anal sphincterotomy with hemorrhoidectomy on post-operative pain, early recovery, better wound healing, decreased analgesia requirement in post-operative period, improved quality of life through lesser duration of stay and faster wound healing.

Aims: This study aimed to assess the effect of internal sphincterotomy on postoperative pain in patients undergoing hemorrhoidectomy.

Methods: This is a randomized, prospective and comparative study included 68 cases of Grade 3 and Grade 4 hemorrhoids who were scheduled for surgical management. The patients were classified randomly into two groups with an equal number of participants. Group A underwent Milligan and Morgan open hemorrhoidectomy along with partial lateral anal internal sphincterotomy and Group B underwent Milligan and Morgan open hemorrhoidectomy alone. Postoperative pain was recorded using Visual Analog Scale (VAS) score at four time periods namely 6 hrs post-surgery, 24 hrs post-surgery, 7 days post-surgery and one month post-surgery. Post-operative analgesia requirement, Anal incontinence, anal stenosis, wound healing, constipation, duration of hospital stay.

Results: Patients who underwent Partial Lateral Anal Internal Sphincterotomy with Open Hemorrhoidectomy showed a significant reduction in postoperative pain. Postoperative analgesia requirement, anal stenosis, wound healing, constipation, duration of hospital stay found to be reduced with partial lateral anal internal sphincterotomy.

Conclusion: From our study, we conclude that performing a partial lateral anal sphincterotomy in Milligan and Morgan open hemorrhoidectomy reduces postoperative pain and aids in early recovery, better wound healing, decreased analgesia requirement and improved quality of life through lesser duration of stay in hospital and faster wound healing.

Key words: Lateral anal internal sphincterotomy, hemorrhoids, hemorrhoidectomy, anal stenosis, anal incontinence

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INTRODUCTION

Hemorrhoids are formed by the downward displacement of dilated submucosal vascular anal cushions, commonly located at 3, 7 and 11 O' clock position in the anal canal. It is a common condition which presents complaints of bleeding per rectum, pain at rest and defecation, mucosal discharge and prolapse. Surgical hemorrhoidectomy is the treatment of choice for grade 3 and grade 4 hemorrhoids ^[1,2].

The surgical techniques employed include the Milligan and Morgan technique, which is most

performed, the Ferguson technique, stapled hemorrhoidectomy, the technique using a harmonic scalpel or ligasure, and Doppler-guided hemorrhoidal artery ligation. The early complications after surgery include postoperative pain, primary hemorrhage, and retention of urine ^[3].

Hemorrhoidectomy is associated with postoperative pain, and no single surgical technique has been proved to significantly reduce the pain ^[4]. The pain following hemorrhoidectomy may be due to anal packing, urinary retention, wound edema, or increased tone due

to spasm of the internal sphincter^[5]. Various invasive and non-invasive techniques have been employed to relieve the spasm such as topical nitroglycerin (NTG), calcium channel blocker (CCB), Lord's dilatation, and lateral sphincterotomy. Each of these measures has its side effects.

We analyzed in our study the effect of lateral internal sphincterotomy with Milligan and Morgan hemorrhoidectomy on postoperative pain, anorectal function.

Objectives

The primary objective of the study was pain relief after surgery in the postoperative period. The pain was assessed by using the Visual Analog Scale (VAS) at 6 hours, 24 hours, 7 days and one-month post-surgery. The secondary objective included postoperative complications like rectal bleeding on POD 1, anal incontinence, anal stenosis, postoperative constipation. The time taken for the first request of rescue analgesia, duration of stay in hospital, wound healing was also noted.

Materials and Methods

This prospective randomized, prospective and comparative study was performed in Government Vellore Medical College and Hospital after obtaining institutional ethical committee clearance. The following patients were enrolled in the study: patients with clinical and investigatory support for the diagnosis and willingness for the surgical management of Grade 3 and 4 hemorrhoids. Any patient with the following was excluded from the study: inflammatory bowel disease, fissure, recurrent hemorrhoids, fistula, malignancy, cirrhosis, and portal hypertension, pregnancy, and age < 20 and > 60 years. All patients enrolled in the study were explained about the study procedure and their informed written consent was taken. The study comprised 68 patients of Grade 3 and 4 hemorrhoids who were randomly divided into two groups of 34 each, named Group A and Group B. In Group A, lateral internal sphincterotomy (LIS) was done in addition to Milligan and Morgan open hemorrhoidectomy and in Group B, only Milligan and Morgan open hemorrhoidectomy was done.

Preoperatively, patients in both groups were optimized. Patients in both groups were prepared by giving soapwater enema the night before surgery. Patients were also advised to take a Sitz bath thrice a day and were taught to maintain proper anal hygiene. Orals were started 6 hours postsurgery and laxatives were prescribed. Inj.pentazocine and Inj.phenergan were given on the night of surgery. Patients in both groups received spinal anesthesia.

After spinal anesthesia, and after the optimal level of block was achieved, the patients were put in lithotomy position, parts painted, and draped. A per rectal examination and preliminary proctoscopy were done. The anal skin was held with Allis forceps and

retracted first at the 7 o'clock position. The hemorrhoidal mass was visualized and held with artery forceps. A V-shaped incision was made at the skin from the anoderm up to the anal mucosa, followed by gentle dissection. The hemorrhoid mass was separated from the internal anal sphincter till the apex of the pedicle was reached. The hemorrhoid pedicle was ligated using vicryl (absorbable suture) and excised in toto. The bare area was left open. A similar procedure was repeated first at 3 o'clock position, and finally at the 11 o'clock position. Complete hemostasis was obtained. An anal pack was kept which was soaked in liquid paraffin and povidone-iodine.

For those in Group A, in addition to the Milligan and Morgan technique, a lateral internal sphincterotomy was also done. Intersphincteric groove was palpated. A 1 cm lateral incision made at 3 o'clock position near the anal verge. A gentle dissection was done along the submucosa till the internal sphincter was reached. The lower free end of the internal sphincter was hooked out using artery forceps and divided. Complete hemostasis was obtained and the wound was left open. The intraoperative bleeding during the surgery was kept to a minimum using cautery and gentle dissection.

Postoperatively, all the patients were kept nil per oral for six hours after surgery and later started on a liquid diet, followed by a soft, high-fiber diet. All the patients in Group A and Group B were routinely given injection paracetamol 1 g intravenously (IV) on the night of surgery. If the patients complained of pain prior to this, then injection tramadol 100 mg IV was given as rescue analgesia. The anal pack was removed in both groups after six hours postoperatively. The patients were also advised on the need for early ambulation and a sitz bath postoperatively to minimize the chances of infection.

Inclusion criteria

- Patients between 20 to 60 years of age.
- Patients with Grade 3 and Grade 4 hemorrhoids.
- Patients with grade 2 hemorrhoids refractory to medical treatment.

Exclusion criteria

- Patients age less than 20 years and more than 60 years.
- Patients not giving consent.
- Patients with inflammatory bowel disease.
- Patients with anal fissure, recurrent hemorrhoids, anal fistula.
- Patients with malignancy.
- Patients with cirrhosis and portal hypertension.
- Pregnancy.

Statistics

Data were analyzed using the Statistical Package for Social Sciences (SPSS); continuous variables were analyzed using unpaired t-test for two means, and

categorical data were analyzed using Chi-square test. Data were expressed as mean ± SD and as percentages where appropriate. P-value <0.05 was considered statistically significant.

Results

Gender distribution

Among 68 patients studied, there were 25 females and 43 males. In case group A there were 13 females and 21 males and in control group B there were 12 females and 22 males. (Table 1)

Table 1: Based on Gender distribution

Table 1	Male	Female	Total
Case	21	13	34
Control	22	12	34
Grand total	68		

Constipation

Constipation acts as a predisposing factor for the development of hemorrhoid. Among 68 patients studied 46 patients had previous history of constipation (67.65%) and 22 patients did not have history of constipation (32.35%). (Table 2)

Table 2: Based on constipation history

Constipation	Case	Control
Present	20	26
Absent	14	08

Smoking history

Among 68 patients studied, 19 patients were smokers (27.94%) and 49 patients were non-smokers(72.06%). Table3

Table 3: Based on smoking history

Smoking	Case	Control
Present	8	11
Absent	26	23

Alcohol consumption

Among 68 patients studied, 18 patients consumed alcohol(26.47%) and 50 patients did not consumed alcohol(73.53%). Table 4

Table 4: Based on alcohol consumption

Alcohol	Case	Control
Yes	09	09
No	25	25

Diabetic history

Among 68 patients studied, 6 patients were diabetic (8.82%) and 62 patients were non-diabetic(91.18%). Table 5.

Table 5: Based on diabetic history

Diabetic	Case	Control
Present	01	05
Absent	33	29

Hypertension history

Among 68 patients studied 6 patients were hypertensive (8.82%) and that of non hypertensives were 62 patients(91.18%).Table 6

Table 6: Based on hypertension

Hypertension	Case	Control
Present	01	05
Absent	33	29

Post-operative pain

Among 68 patients studied, postoperative pain in four time period namely 6 hours, 24 hours, 7 days and one month postsurgery were studied using visual analog scale with pain score of 1 to 10. Over all four time periods, the postoperative pain in case group is the patients in whom hemorrhoidectomy was done along with partial internal anal lateral sphincterotomy was significantly less(pvalue <0.05) compared to control group that is the patients in whom only hemorrhoidectomy was done.

Table 7: Mean postoperative pain

Postoperative pain	Case	Control	P value
6 hours	6.85	8.79	0.00
24 hours	4.97	8	0.00
7 days	2.38	4.76	0.00
30 days	1.52	2.58	0.00

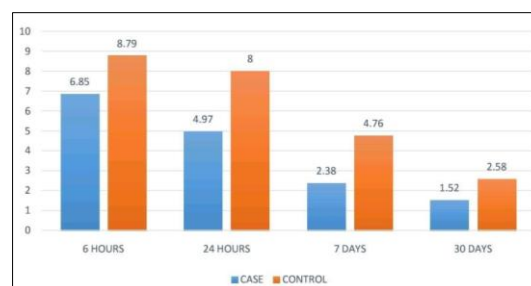


Fig 1

In the above table, mean pain score according to visual analog scale, 6 hours post-surgery was 6.85 in case group and in control group it was 8.79 with a p value of 0.00.

24 hours post-surgery the mean pain score was 4.97 in case group and 8 in control group with p value of 0.00.

7 days post-surgery the mean pain score was 2.38 in case group and 4.76 in control group with p value of 0.00.

30 days post-surgery the mean pain score was 1.52 in case group and 2.58 in control group with p value of 0.00.

The p value obtained in all four time periods were significant(0.00) concluding the fact that post-operative pain were in significantly less in patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy compared to patients who undergo only haemorrhoidectomy.

Post-operative pain 6 hours post-surgery in patients with grade IV haemorrhoids had a mean score of 7.5 in case group and 8.71 in control group with a p value of 0.108 concluding the fact that there was no significant difference in post-operative pain in both case and control in patients with grade IV haemorrhoids undergoing surgery.

Postoperative pain in Grade IV Hemorrhoids 6 hours post-surgery

	Case	Control
Mean	7.5	8.71
P Value	0.108	

Post-operative rectal bleeding on POD-1

Rectal bleeding on POD-1 was studied and was found that rectal bleeding was confined in 33 patients (97.06%) out of 34 cases studied and moderate rectal bleeding on POD-1 was seen only in 1 case (2.94%) studied.

Rectal bleeding was confined in 9 patients (26.47%) out of 34 controls studied and 25 patients (73.53%) had moderate rectal bleeding on POD-1

Table 9: Based on Post-operative Rectal bleeding on POD-1

Rectal bleeding	Case	Control	P Value
Confined	33 (97.06%)	09 (26.47%)	0.00
Moderate	01 (2.94%)	25 (73.53%)	0.00

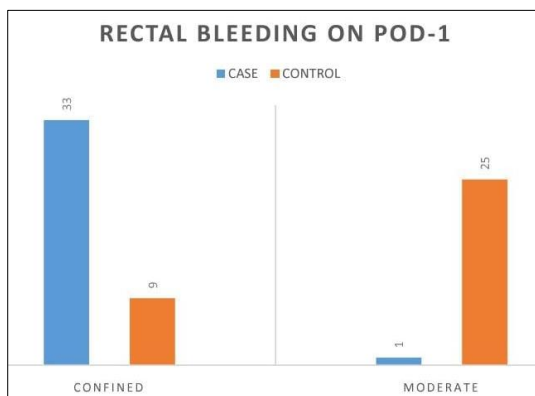


Fig 2: Rectal bleeding on POD-1

The p value was 0.00, hence there was a significant decrease in rectal bleeding in patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy compared to patients who undergo only haemorrhoidectomy.

Post-operative Analgesia requirement

Analgesia requirement in the form IV/IM analgesics on post-operative day 1 was studied and was found that in case group, 13 patients (38.2%) complained of pain for whom analgesics were given and 21 patients (61.8%) did not have parenteral analgesia requirement. Similarly in control group, all 34 patients

had requirement for IV/IM analgesics on post-operative day 1.

Table 10: Requirement of parenteral analgesia

Parenteral analgesia	Case	Control	P Value
Required	13 (38.2%)	34 (100%)	0.00
Not Required	21 (61.8%)	0	0.00

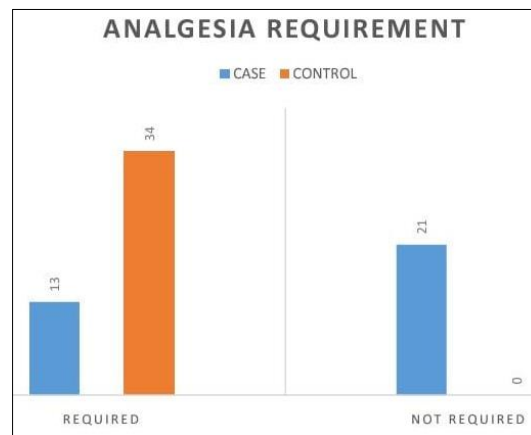


Fig 3: Analgesia requirement

The p value was 0.00, hence there was a significant decrease in analgesia requirement in patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy compared to patients who undergo only haemorrhoidectomy.

Post-operative Anal Incontinence

Anal incontinence on post-operative day 1 was studied and was found that in case group, 1 patient (2.94%) had anal incontinence on postoperative day 1 and 33 patients (97.06%) did not have anal incontinence on postoperative day 1. Similarly in control group, all 34 patients (100%) did not have anal incontinence on postoperative day 1.

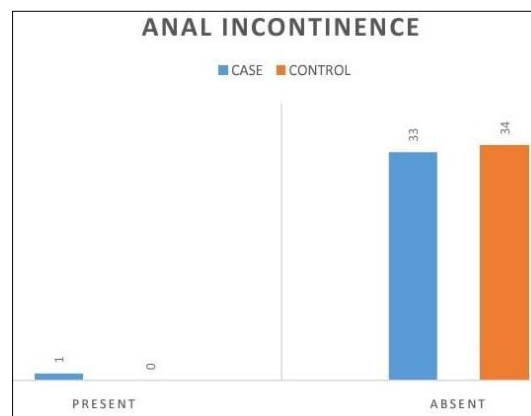


Fig 4: Anal incontinence

Table 11: Based on post-operative anal incontinence

Anal incontinence	Case	Control	P Value
Present	01 (2.94%)	0	1.00
Absent	33 (97.06%)	34 (100%)	1.00

The p value was 1.00, hence there was a no significant difference in anal continence on post-operative day 1 in patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy compared to patients who undergo only haemorrhoidectomy.

Post-operative Anal stenosis

Anal stenosis one month post-surgery was studied and was found that in case group, all 34 patients (100%) did not have anal stenosis one month post-surgery. Similarly in control group, 6 patients (17.7%) had anal stenosis one month post-surgery and 28 patients (82.3%) did not have anal stenosis one month post-surgery.

Table 12: Based on post-operative anal stenosis

Anal stenosis	Case	Control	P value
Present	0	06 (17.67%)	0.025
Absent	34 (100%)	28 (82.3%)	0.025

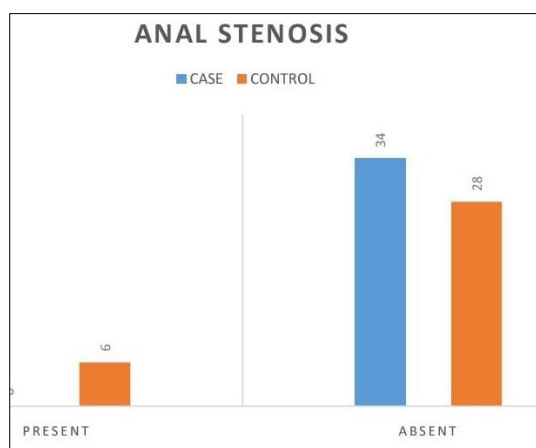


Fig 5: Anal stenosis

The p value was 0.025, hence there was a significant anal stenosis in patients who undergo only haemorrhoidectomy compared to patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy.

Wound healing

Complete wound healing one month post-surgery was studied and was found that in case group, 33 patients (97.06%) had complete wound healing one month post-surgery and 1 patients (2.94%) did not have complete wound healing one month post-surgery. Similarly in control group, 26 patients (76.47%) had complete wound healing one month post-surgery and 8 patients (23.53%) did not have complete wound healing one month post-surgery.

Table 13: Based on post-operative wound healing

Wound healing	Case	Control	P value
Present	33 (97.06%)	26 (76.47%)	0.27
Absent	01 (2.94%)	08 (23.53%)	0.27

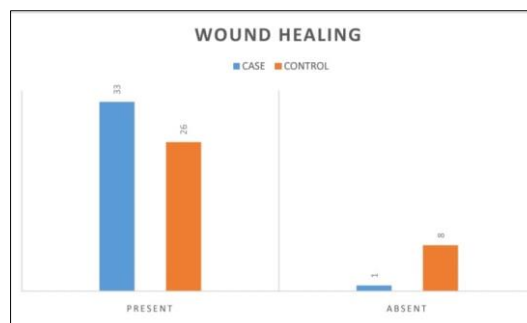


Fig 6: Wound healing

The p value was 0.027, hence complete wound healing was better in patients who undergo only haemorrhoidectomy compared to patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy.

Post-operative constipation

Constipation on post-operative day 1 was studied and was found that in case group, 4 patients (11.76%) had constipation on postoperative day 1 and 30 patients (88.24%) did not have constipation on postoperative day 1. Similarly in control group, 27 patients (79.41%) had constipation on postoperative day 1 and 7 patients (20.59%) did not constipation on postoperative day 1.

Table 14: Based on post-operative constipation

Post-operative constipation	Case	Control	P value
Present	04 (11.76%)	27 (79.41%)	0.00
Absent	30 (88.24%)	07 (20.59%)	0.00

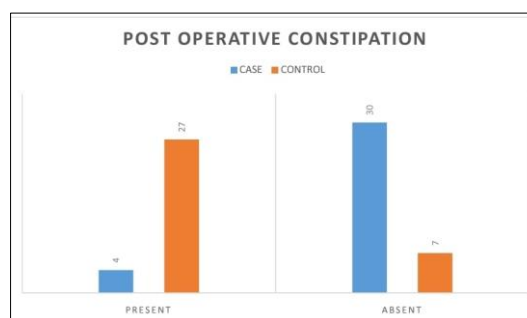


Fig 7: Wound healing

The p value was 0.00, hence there was a significant constipation on post-operative day 1 in patients who undergo only haemorrhoidectomy compared to patients undergoing haemorrhoidectomy along with partial lateral internal sphincterotomy.

Duration of hospital stay

Duration of hospital stay post-surgery was studied and it was found that, in case group 19 patients had a stay duration of one day, 12 patients had stay duration of 1 to 3 days and 3 patients had stay duration of more than three days. Similarly in control group, 9 patients

had stay duration of 1 to 3 days and 27 patients had stay duration of more than three days and no patient was discharged within a day of surgery.

Table 15: Based on duration of hospital stay

Duration of stay (days)	Case	Control	P value
1	19 (55.88%)	0	0.00
1 to 3	12 (35.29%)	9 (26.47%)	0.00
>3	3 (8.82%)	25 (73.53%)	0.00

The mean duration of stay (in days) in patients who undergo haemorrhoidectomy along with sphincterotomy was 1.52 and the median duration of stay was one day and in patients who undergo only haemorrhoidectomy the mean duration of stay was 2.7 and median duration of stay was 3.

Table 16: Mean duration of stay

Duration of stay (days)	Mean	Median
Case	1.52	1
Control	2.7	3

There was a significant increase in duration of stay post-surgery in patients who undergo only haemorrhoidectomy (p value-0.00) compared to patients who undergo haemorrhoidectomy along with sphincterotomy.

Discussion

There are various surgical options for haemorrhoids with Milligan Morgan open haemorrhoidectomy being the most commonly performed surgical treatment for grade III and IV haemorrhoids. The common postoperative complication of open haemorrhoidectomy is pain which can be attributed to spasm of the anal sphincters post-surgery. Performing partial lateral internal sphincterotomy along with haemorrhoidectomy can relieve the post op spasm of sphincters thereby decreasing postop pain in patients undergoing haemorrhoidectomy. Other associated factors like parenteral analgesia requirement one day post-surgery, rectal bleeding on post-operative day one, duration of hospital stay post-surgery, anal incontinence post-surgery, anal stenosis post-surgery were also studied.

68 patients were divided into case group and control group were randomised by block randomised and SNOSE method and patients in control group underwent only haemorrhoidectomy and in case group underwent haemorrhoidectomy along with partial lateral internal sphincterotomy. Patients were prepared by giving soap water enema the night before surgery and patients in respective groups were performed the respective surgery. Orals were started six hours post-surgery and laxatives were prescribed.

Injection pentazocine and Phenergan were given on the night of the surgery.

Pain following surgery on the scale of 1-10 were studied using visual analog scale in four time periods namely 6 hours post-surgery, 24 hours post-surgery, 7 days and 30 days post-surgery.

The results were tabulated and was also expressed in terms of mean pain score. And it was found that the mean score in case group 6hours/24 hours/7days/30days post-surgery were 6.85,4.97,2.38 and 1.52 respectively and in the control group the mean score 6hours/24 hours/7days/30days post-surgery were 8.79,8,4.76,2.58 respectively. The p value in all 4 time periods namely 6 hours, 24 hours, 7 days, 24 days was 0.00. Hence there was a significant decrease in post-operative pain in patients who undergo haemorrhoidectomy along with internal sphincterotomy compared to those who undergo only haemorrhoidectomy.

In patients with Grade IV haemorrhoids who undergo surgery, pain 6 hours post-surgery had a p value of 0.108 signifying that there was no difference in immediate pain relief in both groups in patients with Grade IV haemorrhoids undergoing surgery but p value was significant (0.00) for 24 hours, 7 days and 30 days post-surgery for patients with grade IV haemorrhoids undergoing surgery.

Hence it can be concluded that early post-operative pain i.e. 6 hours post-surgery can be effectively decreased by performing an internal sphincterotomy along with haemorrhoidectomy in patients with grade III haemorrhoids but the role of internal sphincterotomy in decreasing early postoperative pain in patients with Grade IV haemorrhoids remains doubtful. Patients with both grade III and IV haemorrhoids had a significant decrease in pain one day post-surgery and in long run.

Anal pack placed during surgery is removed 6 hours post-surgery and rectal bleeding on post-operative day 1 were studied in three categories as confined, moderate and severe.

The results were tabulated and expressed in percentage also and was found that in case group 97.06% of patients had confined bleeding and only 2.9% of patients had moderate bleeding. In control group 26.4% patients had confined bleeding and 73.6% patients had moderate bleeding. The p value was 0.00, hence rectal bleeding was significantly confined in patients who undergo haemorrhoidectomy along with internal sphincterotomy compared to those who undergo only haemorrhoidectomy.

Duration of hospital stay post-surgery was also studied in three categories namely 1 day, 1 to 3 days and more than 3 days post-surgery and the results were tabulated and was also expressed in terms of mean and median. The mean duration of stay in case group was 1.52 and in control group was 2.7 and the p value was 0.00. Hence performing internal sphincterotomy significantly reduces the duration of hospital stay.

Analgesia requirement on POD-1 in the form of parenteral (IV/IM) was studied and the results were tabulated and expressed in percentage. In case group only 38.2% required parenteral analgesics for more than a day whereas in control group 100% patients required parenteral analgesics for more than a day (p value=0.00). Hence it can be concluded that an internal sphincterotomy in patients undergoing haemorrhoidectomy decreases postoperative pain thereby decreasing postoperative parenteral analgesia requirement.

Anal incontinence is a known complication of internal sphincterotomy. Anal incontinence on postoperative day 1 was studied and the results were tabulated and expressed in percentage. It was found that 97.06% of patients in case group and 100% patients in control group did not have anal incontinence post haemorrhoidectomy. The p value was 1.00 and hence can be concluded that there was no significant anal incontinence in patients in whom internal sphincterotomy was done.

Increased tone of sphincter muscles can cause postoperative constipation in patients undergoing haemorrhoidectomy. Postoperative constipation (POD-1) was studied and the results were tabulated and expressed in percentage. Postoperative constipation on POD-1 was absent in 88.24% of patients in case group and was present in 79.41% of patients in control group (p value=0.00). Hence performing an internal sphincterotomy decreases postoperative sphincter spasm thereby decreasing the incidence of postoperative constipation in patients undergoing haemorrhoidectomy.

Complete wound healing one month after the surgery was studied and the results were tabulated and also expressed in percentage. 97.06% of patients in case group had complete wound healing 30 days post-surgery whereas only 76.47% of patients had complete wound healing in control group. Hence doing an internal sphincterotomy aids in faster and complete wound healing and early recovery of patients undergoing haemorrhoidectomy.

Increased anal sphincter tone and spasm in long run can lead to fibrosis and ultimately stenosis of anal canal. Anal stenosis one month post-surgery whether present or not was studied. The results were tabulated and expressed in percentage. No patients in case group had anal stenosis after 30 days whereas 17.67% of patients in control group had anal stenosis. Thus performing an internal sphincterotomy along with haemorrhoidectomy relieves the spasm, promotes better wound healing and decrease the incidence of post-operative anal stenosis.

Conclusion

Performing a partial lateral internal sphincterotomy in Milligan Morgan open haemorrhoidectomy reduces postoperative pain and aids in early recovery, better wound healing, decreased analgesia requirement and

improved quality of life through lesser duration of stay and faster wound healing.

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