ORIGINAL ARTICLE

Comparison of Perioperative Outcomes : Conventional Milligan Morgan Hemorrhoidectomy Versus Ligasure Assisted Hemorrhoidectomy

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ABSTRACT

Objective: Outcomes based comparison between Milligan Morgan hemorrhoidectomy and ligasure assisted hemorrhoidectomy.

Study Design: Experimental Interventional.

Place and Duration of Study: Surgery department of Holy Family Hospital between December 2021 and May 2022. Duration of study is six months.

Materials and Methods: After informed consent, 44 patients were enrolled and equally divided in two groups. Sample size was calculated in context to another local study. The Group A underwent ligasure assisted hemorrhoidectomy while Group B underwent conventional Milligan Morgan hemorrhoidectomy. Comparison between the groups was done for operative time, postoperative pain, analgesia requirement and duration of hospital stay. Data analysis was done using Statistical Package for Social Sciences (SPSS) version 23.

Results: Patients had mean age of 36.56 ± 11.9 years with male dominance 31 (70.5%). Group A had lesser operative time in minutes when compared to Group B (11.64 ± 1.94 vs 19.55 ± 2.28, p<0.001). Postoperative pain calculated using numeric rating scale was less severe in Group A versus Group B at 12 hours (4.55±1.26 vs 6.91±0.87, p<0.001) and at 24 hours (3.00±1.07 vs 4.41±1.05, p<0.001). 90.5 % patients were discharged in 12 hours in Group A while only 4.5% were discharged in 12 hours in Group B. Overall hospital stay was more in Group B (p<0.001).

Conclusion: Hemorrhoidectomy using ligasure for pedicle coagulation is better than Milligan Morgan hemorrhoidectomy in terms of operative time, postoperative pain and duration of hospital stay.

Key Words: *Hemorrhoidectomy, Ligasure, Milligan Morgan, Operative time, Pain.*

Introduction

Hemorrhoids are enlarged anal cushions that are filled with blood vessels and need subsequent management.[1,2] They can either be external, internal or mixed based on origin from dentate line.[2,3] Internal hemorrhoids are classified into four grades based on reducibility and prolapse.[4,5] Intense pain, excessive bleeding, perianal soiling, prolapse and hematoma formation are among the common reasons why patients seek treatment.[3,6] Contributing factors to hemorrhoids include obesity, lifting heavy weights, prolong sitting and straining, pregnancy, constipation and low fiber diet.[7] Hemorrhoidectomy is conventionally performed by Milligan Morgan technique in which pedicle is ligated at the base and the distal part is then excised out.[8] In ligasure assisted hemorrhoidectomy, ligasure is used to seal mucosal edges and divide the pedicle.[9] Postoperative pain varies with the type of procedure performed. Usually, anal canal remains painful for two to four weeks. If this postoperative pain can be reduced, patient can be mobilized early and quicker rehabilitation can be achieved.[10] A meta-analysis shows that ligasure assisted technique leads to less postoperative pain, decreased length of hospital stays and more patient comfort. Again, the operative time is markedly reduced by ligasure method as the procedure is relatively robust.[9] Rationale of this study was to ascertain if ligasure assisted hemorrhoidectomy is superior to conventional Milligan Morgan hemorrhoidectomy in terms of surgical operative time, postoperative pain and duration of hospital stay.

Materials and Methods

This experimental interventional research was carried out in surgery department at Holy Family Hospital, Rawalpindi after ethical review board

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Received: May 02, 2023; Revised: August 20, 2023
Accepted: August 21, 2023

https://doi.org/10.57234/jiimc.september23.1699

approval (Reference No. M-26/63/RMU). Study duration was six months from Dec 2021 to May 2022. After fulfilling the selection criteria and written informed consent 44 patients were enrolled. Sample size was calculated using a local reference study.[11] The sample size calculated was 44 patients (22 in each group). Patients above 18 years with American Society of Anesthesiologists (ASA) I or II and grade III or IV hemorrhoids were included. Exclusion criteria included those with ASA III or more, Grade I or Grade II hemorrhoids, obstetrical patients, morbidly obese, those unfit for spinal anesthesia or those having thrombosed hemorrhoids. Anesthesia evaluation was done one day prior to surgery and standard fasting of six hours to solids and 2 hours to clear fluids was applied. Patients were divided by simple random sampling method in to two equal groups; Group A (Ligasure assisted haemorrhoidectomy) and Group B (Milligan Morgan haemorrhoidectomy). On the day of surgery, all patients were given kleen enema in morning. During surgery hemorrhoidal bundles were identified and followed by either conventional ligation or vessel sealing by ligasure. Paraffin gauze was left inside the anal canal and removed postoperatively at six hours. All surgeries were performed by either one of the two specified consultants. Duration of surgery in minutes was noted by principal author. To assess pain the patients were asked to rate the pain using numeric pain rating scale (NRS) of 0 to 10 at 12 hours and 24 hours postoperatively. Collected data included age, gender, ASA group, operative time, postoperative pain, and duration of hospital stay. Mean and standard deviation was calculated for quantitative variables such as age, numeric pain rating score, hospital stay and operative time. Categorical data like gender, ASA group and required analgesia were documented in frequency and percentages. Analysis of the collected data was done using Statistical Package for Social Sciences (SPSS) version 23. An Independent t-test was used for comparing numeric data and Chi square test was used for comparing categorical data, between the two groups. 95% confidence level was taken for all statistical tests in the study. P value of less than 0.05 was considered statistically significant.

Results

The mean age of the patients was 36.70 ± 11.82 years with 31 (70.5%) males ranging from 19 years to 65 years. Demographic details with respective groups and p values are given in Table I.

Table I: Description of Demographic Variables in Group A and Group B

Variable		Total	Ligasure (Group A)	Conventional (Group B)	P-value
		Mean ± SD / Count (%)	Mean ± SD / Count (%)	Mean ± SD / Count (%)	
Age		36.70 ± 11.82	35.36 ± 12.61	37.81 ± 11.33	0.508*
Gender	Male	31 (70.5%)	16 (72.7%)	15 (68.2%)	0.500**
	Female	13 (29.5%)	6 (27.3%)	7 (31.8%)	
ASA	I	40 (90.9%)	20 (90.9%)	20 (90.9%)	0.697**
	II	4 (9.1%)	2 (9.1%)	2 (9.1%)	

*Independent t test ** Chi-square
ASA – America Society of Anesthesiologists

Group A had less operative time, lesser pain score at 12 hours and 24 hours and shorter length of hospital stays in hours as compared to Group B. These results were found to be statistically significant (p value < 0.05). Comparative details between Group A and Group B outcome variables are detailed in table II.

Table II: Comparison of Outcome Variables in Group A and Group B

Variable		Group A	Group B	P-value
		Mean ± SD / Count (%)	Mean ± SD / Count (%)	
Operative time in Minutes		11.64 ± 1.94	19.55 ± 2.28	<0.001*
Hospital Stay	Daycare (12 hours)	20 (90.9%)	1 (4.5%)	<0.000**
	1 Day (24 hours)	2 (9.1%)	19 (86.4%)	
	2 Days (48 hours)	0 (0.0%)	2 (9.1%)	
Pain at 12 hours (NRS)		4.55 ± 1.26	6.91 ± 0.87	<0.001*
Severity at 12 hours	Mild	8 (36.4%)	0 (0.0%)	<0.001**
	Moderate	14 (63.6%)	7 (31.8%)	
	Severe	0 (0.0%)	15 (68.2%)	
Pain at 24 hours (NRS)		3.00 ± 1.07	4.41 ± 1.05	<0.001*
Severity at 24 hours	Mild	17 (77.3%)	2 (9.1%)	<0.001**
	Moderate	5 (22.7%)	19 (86.4%)	
	Severe	0 (0.0%)	1 (4.5%)	
Inj Paracetamol requirement		1.68 ± 0.56	3.55 ± 1.60	0.007*
Inj Ketorolac requirement		0.13 ± 0.35	1.45 ± 1.22	0.004*

*Independent T test ** Chi-square

Discussion

Mean age in our study was comparable to a study done in Iraq.[12] 70.5% patients were male in our study and this male predominance was also seen in local

https://doi.org/10.57234/jiimc.september23.1699

and international studies.[13,14] This may be because male gender is more predisposed to physical exertion, that contributes to hemorrhoids. Many techniques have been employed for hemorrhoidectomy in context to improving postoperative outcomes and decreasing complications, but none is found to be superior over the other.[15] Therefore, modification of surgical approach has become an area of focus for surgeons especially with development of novel technologies such as ligasure, harmonic scalpel, thunderbeat etc.[16] Ligasure assisted hemorrhoidectomy is a relatively new technique, though relatively expensive, but it is found to have reduced operative time and postoperative complications.[17,18] The operative time in our research was less in the ligasure assisted hemorrhoidectomy group when compared with traditional Milligan Morgan group by 8 minutes (p value < 0.001). A comparative study conducted in Iran also reported that operative time was lesser in ligasure hemorrhoidectomy compared to Milligan Morgan group (p value < 0.001).[17] The Egyptian study reported operative time similar to our study which was less in ligasure group.[18] A study carried out by Peker et al, reported that ligasure group had lesser operative time as well as quicker return to work in these patients.[19] An Italian study have also reported shorter operative time with use of energy devices.[20,21] Significant number of patients were discharged on the same day in ligasure assisted hemorrhoidectomy group in comparison to traditional Milligan Morgan group (p value <0.001) comparable to a study conducted in Baluchistan.[22] Pain after surgery and its severity was also much less in ligasure assisted hemorrhoidectomy group at both 12 hours (p value < 0.001) and 24 hours (p value < 0.001). This was also seen in study done at Karachi.[23] This correlates with the analgesia requirement that was less in ligasure group (p value for paracetamol = 0.007 and p value for ketorolac = 0.004). International data also reports lesser need for analgesia on 1st postoperative day and 2nd postoperative day with ligasure appraoch.[17] Similarly a Pakistani study reported lesser postoperative pain as well as reduced analgesia requirement with ligasure technique as compared to conventional method.[1,24]

Limitations of Study

This study did not address short- and long-term complications of the procedure as well as the time taken by the patients to get to normal life. Use of ligasure adds cost burden to the patient and remains a hurdle in cost effective management of hemorrhoids, especially in developing country like ours.

Recommendations

Future research prospects should also compare long-term outcomes with added variables like experience of performing surgeon, comorbid conditions, cost effectiveness and complications.

Conclusion

Hemorrhoidectomy using ligasure for pedicle coagulation is better than Milligan Morgan hemorrhoidectomy in terms of operative time, postoperative pain and duration of hospital stay.

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CONFLICT OF INTEREST

Authors declared no conflicts of Interest.

GRANT SUPPORT AND FINANCIAL DISCLOSURE

Authors have declared no specific grant for this research from any funding agency in public, commercial or nonprofit sector.

DATA SHARING STATMENT

The data that support the findings of this study are available from the corresponding author upon request.