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Comparison of Direct Pressure versus Electrocauterization of Liver Bed for Bleeding Control in Laparoscopic Cholecystectomy

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Abstract

Objective: To Determine the Hemostasis Control and Pain Score in Laparoscopic Cholecystectomy Using Direct Pressure and Monopolar Electrocautrization in Two Groups to Stop the Bleeding. Background: Laparoscopic Cholecystectomy Came to Light in the 1990s As a New Surgical Procedure That Was Quickly Accepted by General Surgeons (80%), Particularly in France and The United States. Regardless of the Positive Outcomes, During Laparoscopic Cholecystectomy the Most Life Threatening Complication Is Hemorrhage. Cholecystitis and Bile Duct Injury Are the Most Prevalent Significant Consequences of Laparoscopic Cholecystectomy. Study Design: A Randomized Controlled Trial Place and Duration: This Study Was Conducted in Bhitai Dental and Medical College Hospital Mirpurkhas from October 2022 to October 2023. Methodology: A Total of 140 Patients (70 In Each Group) Were Taken for This Study. All Patients Undergoing Laparoscopic Cholecystectomy with Cholelithiasis Verified on Ultrasound and Admitted Through the Outside Patient Department Were Included. T-Test and Chi Square Test of Association Were Used to Determine the Strength of Association Between Variables. P-Value Less Than 5% Was Considered Significant Results: There Were 24 (17.14%) Males And 116 (82.86%) Females in Our Study. The Bleeding Was Secured In 84.29% Cases in Dp Group And 91.43% Cases in Me Group. The Drain Was Placed In 20.34% And 9.38 % in Dp and Me Groups Respectively. The Pain at The Intervals of 6, 12 And 24 Hours Was Significantly Different Across the Two Groups in The Study. Conclusion: The Study Concluded That the Electrocautrization Is Preferable to Direct Pressure During Laparoscopic Cholecystectomy for Hemostasis of The Liver Bed.

Keywords

Laparoscopic Cholecystectomy, Blood Hemostasis, Pain Score.

Laparoscopic cholecystectomy came to light in the 1990s as a new surgical procedure that was quickly accepted by general surgeons (80%), particularly in France and the United States [1]. Each year, around

500,000 to 700,000 people have laparoscopic cholecystectomy in the United States [2]. Laparoscopic cholecystectomy is preferable over open cholecystectomies because of lower surgical morbidity, shorter hospital stay, and faster recovery [3, 4]. Regardless of the positive outcomes, most studies found that biliary system injuries were more likely in laparoscopic cholecystectomy than in open cholecystectomy [5-10]. A constant frequency of referrals for post LC-related bile-duct injury (BDI) care was also mentioned as indication of a significant complication rate. Some of the consequences of open gall bladder removal (open cholecystectomy) are caused by abdominal wall injuries. Even in patients with pregnancy, hernias, and abdominal ascites, laparoscopic cholecystectomy is a viable surgical option for acute cholecystitis [11]. Despite the fact that laparoscopic cholecystectomy is favored over open cholecystectomy due to cheaper treatment costs, shorter hospital stays, and faster return to work. However, both treatments have anesthesia-related problems in common. [12].

One of the most common complication after laparoscopic gallbladder removal is Hemorrhage [13]. It can be a difficult event if large and uncontrollable bleeding suddenly obscures vision, resulting in the change of laparoscopic cholecystectomy to an open surgery [14]. Monopolar electrocautery, bipolar electrocautery, ultrasonic coagulation, and direct pressure on the liver bed are all employed in laparoscopic cholecystectomy [15]. Therefore this study is aimed to determine the hemostasis control and pain score in laparoscopic cholecystectomy using direct pressure and monopolar electrocautrization in two groups to stop the bleeding.

Methodology

A randomized control trial was carried out on 140 patients (70 in each group). All patients undergoing laparoscopic cholecystectomy with Cholelithiasis verified on ultrasound and admitted through the outside patient department were included in the research. Patients with a history of bleeding disorders, repeated abdominal operations, gall bladder mass, or ascites were excluded.

All the patients were divided into two groups using randomized sampling method. The consultant surgeon carried out the 3 port laparoscopic cholecystectomy, with the help of L hook the surgeon dissected the gall bladder meanwhile securing the cystic artery according to the standard protocols.

In DP group (Direct Pressure) we applied direct pressure with the help of gauze for 5 minutes, while we used monopolar electrocautrization to control group (ME group). If the bleeding did not stop using both techniques in either groups, we managed the bleeding by standard guidelines for hemostatic.

The oozing blood during surgery was the primary outcome and the surgeon assessed it during the procedure, the secondary outcome was postoperative bleeding which we assessed on ultrasound if it was more than 10 ml or collected in the drain in same amount. We used visual analogue scale for postoperative pain at 6, 12 and 24 hours interval. Collected data was entered to SPSS version 21 and was analyzed. Quantitative data like age and pain score was described as mean ± SD.

We used descriptive statistics (mean and SD) and frequencies and percentage for quantitative and qualitative variables respectively. T-test and chi square test of association were used to determine the strength of association between variables. P-value less than 5% was considered significant

Results

The findings of the study revealed that there were 24 (17.14%) males and 116 (82.86%) females. The proportion of females in DP group was 81.43% and 84.29% in ME group. Out of total 140 patients, the rural urban distribution was nearly similar as 52.14% and 47.86% respectively. The mean age in DP group and ME group was 43.51±6.39 years and 47.33±7.12 years respectively.

Table I: Sociodemographic Details of Study Participants.

Variables	DP (n=70)	ME (n=70)	Total	Variables	DP (n=70)
	n	%	n	%	
Gender					
Male	13	18.57	11	15.71	24 (17.14%)
Female	57	81.43	59	84.29	116 (82.86%)
Residence					
Rural	32	45.71	41	58.57	73 (52.14%)
Urban	38	54.29	29	41.43	67 (47.86%)
Age (Years)					
Mean and SD	43.51±6.39		47.33±7.12		

The bleeding was secured in 84.29% cases in DP group and 91.43% cases in ME group. The drain was placed in 20.34% and 9.38 % in DP and ME groups respectively. The collection of blood more

than 10 ml in 24 hours was observed in 2 patients in DP group only. There was no hematoma in ME group after 24 hours of the surgery however, two patients reported to have hematoma within 24 hours of the surgery. (As shown in Table II)

Table II: Comparison of Study Variables in ME and DP Groups.

Variables	DP	ME	Total	P-Value	Variables	DP
Intraoperative bleeding	n	%	n	%		
Bleeding Secured	59	84.29	64	91.43	123	
Bleeding Unsecured	11	15.71	6	8.57	17	0.04
Total	70	100.00	70	100.00	140	
Drain placement						
Yes	12	20.34	6	9.38	18	
No	47	79.66	58	90.63	105	0.09
Total	59	100.00	64	100.00	123	
Collection of blood (>10 ml/24h) in Drain						
Yes	2	16.67	0	0.00	2	
No	10	83.33	6	100.00	16	0.001
Total	12	100.00	6	100.00	18	
Hematoma (after 24 hours of surgery)						
Yes	2	3.39	0	0.00	2	
No	57	96.61	64	100.00	121	--
Total	59	100.00	64	100.00	123	

The pain at the intervals of 6, 12 and 24 hours was significantly different across the two groups in the study. At 6th hour, the mean pain score in DP group was 7.8 and 6.4 in ME group, mean pain score was 6.22 and 5.8 at 12th hour and 4.8 and 4.1 at 24th hour in DP and ME respectively. The p-value across three intervals was 0.04, 0.001, 0.03 at 6th 12th and 24th hour respectively. (As shown in Table III)

Table III: Descriptive Statistics regarding Pain Score.

Pain Variables	DP (n=59)	ME (n=64)	p-value
Pain status at 6thhour			
Mean	7.8	6.4	0.04
SD	1.12	0.45	
Range	4	3	
Min	5	4	
Max	9	7	
Pain status at 12th hour			
Mean	6.22	5.8	0.001
SD	1.31	0.43	
Range	4	3	
Min	4	4	
Max	8	7	
Pain status at 24th hour			
Mean	4.8	4.1	0.03
SD	0.98	0.23	
Range	4	3	
Min	3	2	
Max	7	5	

Discussion

During Laparoscopic cholecystectomy the most life-threatening complication is hemorrhage [16] Cholecystitis and bile duct injury are the most prevalent significant consequences of laparoscopic cholecystectomy. [17]. Therefore this study was conducted to evaluate the intraoperative and postoperative bleeding hemostasis using two different techniques besides determining pain scores at different intervals.

The findings of the current study revealed that there were 24 (17.14%) males and 116 (82.85%) females. A similar study was conducted among patients of laparoscopic cholecystectomy which included 60% females and 40% males [18]. Another study carried out on patients of laparoscopic cholecystectomy reported 23% males and 77% females [19].

The proportion of females in DP group was 81.43% and 84.29% in ME group. Out of total 140 patients, the rural urban distribution was nearly similar as 52.14% and 47.86% respectively. The mean age in DP group and ME group was 43.51±6.39 years and 47.33±7.12 years respectively. A similar study conducted in Pakistan reported that the mean age in direct pressure group and electrocautrization group was 40.38 ± 12.30 years and 42.15 ± 10.40 years respectively.

The bleeding was secured in 84.29% cases in DP group and 91.43% cases in ME group. In line with our findings, Mukhtar et al reported that the bleeding was secured 85% and 96% in likewise groups [20]. The drain was placed in 20.34% and 9.38 % in DP and ME groups respectively. The collection of blood more than 10 ml in 24 hours was observed in 2 patients in DP group only. There was no hematoma in ME group after 24 hours of the surgery however, two patients reported to have hematoma within 24 hours of the surgery. In contrast Mukhtar et al didn't reported any

hematoma in either groups [20].

The pain difference at the intervals of 6, 12 and 24 hours was significant across the two groups in the study. In line with our findings, Akturk et al reported significant difference in pain score accorss the four groups in hi study [19]. Additionally, in his study, Karnail Singh observed very low pain scores in patients who had Laparoscopic Cholecystectomy using the electrocautery method [21].

The research focused primarily on hemostatic management of the liver bed during laparoscopic cholecystectomy. The technique of choosing is mostly determined by the surgeon. If the hemorrhage from the liver bed is significant, cauterization and pressure application may fail. Furthermore, in settings where more modern procedures, such as harmonic scalpels, are consistently employed, the incidence of liver bed hemorrhage may be reduced.

Conclusion

In this study, after applying both techniques to secure blood hemostasis, and evaluating the pain scores, we conclude that electrocautrization is preferable to direct pressure during laparoscopic cholecystectomy for hemostasis of the liver bed.

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Conflicts of Interest

The authors declare no conflict of interest.

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