ORIGINAL ARTICLE

Comparison of Gallbladder Perforation During Dissection From Liver Bed in Patients Undergoing Monopolar Electrocautery With Those Undergoing Ultrasonic Dissection during Lap. Cholecystectomy

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ABSTRACT

Aim: comparison of gallbladder perforation during dissection from liver bed in patients undergoing monopolar electrocautery with those undergoing ultrasonic dissection during laparoscopic cholecystectomy
Settings: Department of Surgery, Bahawal Victoria Hospital, Bahawalpur.
Duration of study: From: January 2015 to December 2015
Results: The mean age of our patients was recorded as 35.88±6.52 in Group-A and 36.41±6.24 in Group-B. The surgery duration was calculated as 31.97±4.34 minutes in Group-A and 34.05±4.62 minutes in Group-B. We recorded 19.05%(n=12) in ultrasonic dissector group and 46.03%(n=29) cases with perforation in monopolar electrocautery group, (p: 0.001).
Conclusion: Perforation of gallbladder during dissection from liver bed in patients undergoing monopolar electrocautery is significantly higher when compared with those undergoing ultrasonic dissection during laparoscopic cholecystectomy.
Keywords: Laparoscopic Cholecystectomy, Dissection from Liver Bed, Monopolar Electrocautery, Ultrasonic Dissection, Gallbladder Perforation

INTRODUCTION

Laparoscopic cholecystectomy a gold standard for management of cholelithiasis is often complicated by gallbladder perforation.[1] Perforation can occur during traction, grasping and dissection of gallbladder.

Gallbladder perforation during its dissection from liver is not uncommon during laparoscopic surgery. Significant incidence of gallbladder perforation has been reported.[2,3,4] The perforation leads to spillage of bile and stone in peritoneal cavity. This leakage and spillage of bile into peritoneal cavity contributes to prolong duration of surgery and increase incidence of post-operative morbidity.[5] To dissect the gallbladder either electro surgical cautery or ultrasonic dissector can be used.

Traditionally monopolar electro cautery is widely used for dissection and is associated with lateral tissue damage and inadvertent perforation.[6] Monopolar electrocautery is used in different shapes of which L hook is most common shape. Ultra sonic dissector utilizes high frequency vibration to achieve vessel sealing and tissue cutting so there is less thermal injury and smaller area of lateral tissue damage.[7] It is increasingly being used as better alternative in gallbladder surgery. There is less incidence of perforation with ultrasonic dissection as compare to monopolar electric cautery[2,3,4].

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Gall bladder perforation was recorded in 12(40%) of the cases in the electrocautery group and 5(16.7%) patients in the ultrasonic dissection group.[3] Laparoscopic cholecystectomy is most common elective surgical procedure in our population with electro cautery being the traditional method of dissection and ultrasonic dissector as the recent intervention. As compared to the international literature, much work has not been done on this topic in Pakistan. This study will be conducted to compare the burden of gallbladder perforation during dissection between monopolar electrocautery and ultrasonic dissector so that it can be implemented in the future.

MATERIAL AND METHODS

A total of 120 diagnosed cases of Cholelithiasis (having more than or equal to one stone in gall bladder) and those who were selected for laparoscopic cholecystectomy due to benign pathology like gallstones. The age of our patients was between 20-50 years while male and female both genders participated in our study. In our study, patients suffering with cholelithiasis with the association of choledocholithisis i.e., stone in cholelithiasis, common bile duct, having recent or past history of acute pancreatitis and those who are having any previous abdominal surgery, in addition those females with pregnancy were also excluded. We collected these patients from out patients'

department of surgery, of (BVH), Bahawal Victoria Hospital, Bahawalpur. We adopted randomization of these cases in two equal groups named A & B. Electrocautery was performed in those cases with A Group while Group-B cases were managed with ultrasonic dissection. Similar surgical steps were performed in both of these groups. We planned to use standard 4 ports of 10mm at epigastrium and umbilical and the gallbladder was removed from epigastric ports. We used monopolar electrocautery of L, hook shape in patients underwent with electrocautery with cutting setting (50) blend mode and coagulation(50) blend mode. Ultrasonic dissector was used by adopting frequency of 55500Hz with vibratory excursion of 50-100 micrometer in patients of Group-A. The outcome variable in this study i.e. perforation was observed and recorded in both groups. Both the groups were compared with the help of chi-square test (a statistical tool) for any significant difference in A&B groups, with regards to occurrence of perforation.

RESULTS

The mean age of our patients was recorded as 35.88±6.52 in Group-A and 36.41±6.24 in Group-B (Table 1). Females in our study were in majority by calculating 43(68.33%) in Group-A and 46(73.02%) in Group-B were females, rest of the 19(31.67%) cases of Group-A and 16(26.67%) of Group-B were male (Table 2). The surgery duration was calculated as 31.97±4.34 minutes in Group-A and 34.05±4.62 minutes in Group-B (Table 3). We recorded 12(19.05%) in ultrasonic dissector group and 29(46.03%) cases with perforation in monopolar electrocautery group, (p: 0.001) (Table 4).

Table 1: Age distribution (n=120)

Age (years)	Group A	Group B
20-35	21(35%)	25(41.57%)
36-50	39(65%)	35(58.33%)
Total	60(100%)	60(100%)
Mean±SD	35.88±6.52	36.41±6.24

Table 2: Gender distribution (n=120)

Gender	Group A	Group B
Male	19(31.67%)	16(26.67%)
Female	41(68.33%)	44(73.33%)
Total	60(100%)	60(100%)

Table 3: Mean duration of surgery (n=120)

Group A		Group B	
Mean	**SD**	**Mean**	**SD**
31.97	4.34	34.05	4.62

Table 4: Compare the frequency of gallbladder perforation (n=120)

Perforation	Group A	Group B
Yes	12(19.05%)	29(46.03%)
No	51(80.95%)	34(53.97%)
Total	63(100%)	63(100%)

DISCUSSION

Laparoscopic cholecystectomies become problematical when the gallbladder is perforated and loss of bile or stones into cavity of peritoneum. Electrocautery remains the main energy form while using during laparoscopic dissection. Ultra sonic dissector utilizes high frequency vibration to achieve vessel sealing and tissue cutting so there is less thermal injury and smaller area of lateral tissue damage. As compared to the international literature, much work has not been done to compare the frequency of gallbladder perforation during dissection from liver bed in patients undergoing monopolar electrocautery with those undergoing ultrasonic dissection during laparoscopic cholecystectomy.

Mahabaleshwar V and others[8] revealed that gall bladder perforation occurred in 12 (40.0%) patients in the electrocautery group and 5 (16.7%) patients in the ultrasonic dissection group.[3] Nadim Khan and others compared the safety of ultrasonic and electrocautery method of dissection in terms of gall bladder perforation and recorded that the incidence of GB perforation was significantly lower in ultrasonic dissection (10.9%) than electrocautery methods of dissection (29.7%), hence the safety of ultrasonic dissection in terms of gall bladder perforation, was significantly higher than electrocautery dissection (89.1% vs. 70.3% p-value=0.007), they concluded that ultrasonic dissection is safer modality of dissection in terms of gall bladder perforation and its use should be encouraged as routine method of dissection during LC.

Another study[4] revealed that gallbladder perforation risk with bile leak, stone loss, or both, is lower with ultrasonic dissection (P<0.0001 and P=0.002, respectively), and in the subgroup of complicated cases, the risk of perforation is significantly lower (P=0.003).

Brokelman et al[9] revealed that ultrasonic scalpel dissection is associated with lower peritoneal total and active GTF-β1 levels compared with electrocautery (P<0.005 and P<0.01, respectively) at the end of surgery, suggests a reduced risk of formation of peritoneal adhesions with the former dissection device.

In accordance with other studies, the hypothesis that “the frequency of perforation of gall bladder is less in patients undergoing laparoscopic cholecystectomy with ultrasonic dissector as compared to those with monopolar electrocautery” is justified.

The findings of this study are primary in our targeted population and needs some other trials to validate our findings so that it can be implemented in the future.

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