

Study of operated patients of laparoscopy cholecystectomy without using energy source

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Abstract

Introduction: Laparoscopic cholecystectomy (LC) is one of the most common surgeries performed by general surgeon. It is gold standard for symptomatic gall stone disease. But still it is not as safe as open surgery. Most of the surgeons uses electro thermal energy device to do dissection at callot's triangle for coagulation of blood vessels and separation of gallbladder from liver bed. There were incidences of thermal injuries of biliary tree, vascular tree and bowels, duodenum. These types of injuries are dangerous and causing high level of morbidity and mortality. With great care also there are direct and spreading thermal injuries. Many of such injuries are not appreciated during surgery and reveal later on. We have done data analysis of Laparoscopic cholecystectomy without electro thermal energy. **Objective:** The main objective of study is to find reduction of complication rate without energy device in laparoscopic cholecystectomy. To find the possibility of avoidance of injuries done by electrothermal devices, technical difficulty of surgery done without energy source, conversion rate for open and intraoperative and postoperative bleeding and other complications. **Methods:** We have done retrospective data analysis of 30 cases of laparoscopic cholecystectomy done by using hand laparoscopic instruments with standard four ports and without energy devices which includes both sexes with 20 to 75 yrs of age, between years 2011 to 2015 at Civil Hospital attached with GMERS medical college, Gandhinagar, Gujarat, India. The follow-up data of all patients were evaluated for operative and postoperative outcomes. **Results:** 29 out of 30 patients were operated by this method; 1 patient was converted to open surgery because of difficult cholecystectomy and very dense adhesions. 1 patient had minimal bile leak which was stopped spontaneously. Not a single patient was converted to open because of bleeding and vision disturbances, not a single case of post operative haemorrhage. There was no hemodynamic instability during and after surgery, no conversion to open due to no use of electrocautery, no injury of biliary tree, vacular or bowel and no mortality. **Conclusion:** Laparoscopic cholecystectomy without using energy source has advantage of preventing thermal injuries to biliary tree and bowels and vascular structures. It can be safely performed without using any energy source.


Keywords: Energy sources; Thermal injury; Bile duct injury; Laparoscopic cholecystectomy

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INTRODUCTION

Laparoscopic cholecystectomy is the most commonly done laparoscopic surgery. Most of the surgeons use energy source electrocautery near callots triangle and in liver bed to keep operative field clean and bloodless. It

has its advantage of keeping area clean and bloodless and decrease operative time. But sometimes there are direct or indirect thermal injuries to biliary tree, intestines or spreading thermal injuries to surrounding.^{1,2,3} Current may spread through damaged insulation of laparoscopic instruments. These types of injuries go mostly unnoticed during surgery and revealed later on.¹ Such injuries cause significant morbidity and mortality to patients. Laparoscopic cholecystectomy without using energy source excludes complication of thermal injury.^{3,4,5} It is technical difficult as there is more oozing blood and bleeding so operative field may become blur in-between and increase operative time. Mostly gauze piece and pressure technique was used to control oozing and making field clean and application of liga clips at smaller vessels is useful. This is retrospective analysis of operated patients of laparoscopic cholecystectomy without energy

device between years 2011 to 2015 in civil hospital attached with GMERS medical college Gandhinagar, Gujarat, India.

MATERIAL AND METHODS

We have done retrospective data analysis of 30 cases of laparoscopic cholecystectomy done by using hand laparoscopic instruments with standard four ports and without energy devices which includes both sexes with 20 to 75 yrs of age, between years 2011 to 2015 at Civil Hospital attached with GMERS medical college, Gandhinagar, Gujarat, India. out of 30 patients, 29 had gallbladder stones with attack of cholecystitis, one patient had gallbladder polyp. Detailed history, preoperative clinical, pathological and radiological investigations were recorded. Patients were between 20 to 70 yrs of age. All patients were undergone anaesthetic evaluation before surgery. Consent for surgery, possible complications and conversion for open surgery were taken. All patients operated under general anaesthesia and using four ports with no energy source. Dissection was carried out by Maryland forceps and scissors. Blood vessels were clipped and cut, Tube drain placed in morison pouch that was removed within 48 hours. Electrothermal device was kept ready if need arise and open surgery instruments were kept standby. Causes for conversion to open surgery were evaluated. Data were collected for intraoperative haemodynamic instability, bleeding, need for blood transfusion, injuries of biliary tree, bowel or vascular injury. Postoperative data of haemodynamic instability, postoperative bleeding, intra abdominal collection or late presentation of injury in postoperative period were evaluated. Follow up data after discharge up to one month for late presentation of biliary leak, intraabdominal collection were evaluated.

RESULT

Most common age group is 50 to 60 years. Detail of age group is shown in table 1. Sex wise distribution of 23 females and 7 male shown in table 2. Most commonly chronic inflammation was main cause in this group. There were patients with different types of inflammation shown in table 3. Operative Time: was between 45 -120 min with median operative time of 76 to 90 minutes shown in table 4. There was 10 to 100 cc intraoperative blood loss and postoperative drain of less than 100 cc serosanguinous drain. None of patients required blood transfusion due to bleeding. No biliary, vascular or bowel injury was encountered during surgery (Table 5). There was no intraoperative haemodynamic instability and anaesthetic complication. 1 patient was converted to open because of difficult cholecystectomy due to mirizzi syndrome (Table 6). Post Operative: There was no single

case of collection or significant blood in tube drain requiring reoperation. 1 case of bile leak and that stopped spontaneously in one week (table7). 29 patients operated by lap cholecystectomy were started oral in 24 hours and 1 patient which converted to open was started oral after 24 hours. All patients were followed up for 6 months. NO cases of late billiary injury, collection of blood or bile in intra abdominal were encountered.

Table 1: Age group distribution

Age (years)	No of patients
20-30	3
30-40	7
40-50	7
50-60	9
60-70	3
70-75	1
Total	30

Table 2: Sex wise distribution

Sex	No of patients
Male	7
Female	23
Total	30

Table 3: Pre operative clinical-radiological diagnosis

Clinical-Radiological diagnosis	No of patients (n=30)
Acute cholecystitis	10
Chronic cholecystitis	19
Gall bladder polp	1

Table 4: Operative time

Operative time (minutes)	No of patients (n=30)
45 to 60	7
61 to 75	5
76 to 90	9
91 to 105	5
106 to 120	2
121 to 135	2

Table 5: Intra operative complication

Intra operative complication	No of patients (n=30)
Haemorrhage liver bed	0
Bowel/duodenum injury	0
Bile duct injury	0
Haemorrhage vascular injury	0

Table 6: Conversion to open

Cause of conversion to open	No of patients (n=30)
Mirizzi	1
Bleeding	0
Adhesions	0

Table 7: Post operative complication

Post operative complication	No of patients (n=30)
Haemorrhage	0
Bile leak	1
Fecal leak	0

DISCUSSION

Variety of energy sources is used to facilitate dissection and hemostasis, but none of them are biological inert.¹ Monopolar electro-surgery by hook or Maryland forceps are choice of majority of surgeon. But both are potentially harmful.^{1,2,3} They are implicated in injuries of common bile duct, duodenum, vessels and development of biliary strictures.^{5,6,7} Energy sources causes charring so sometimes it causes errors in clear identification of structures than using scissors. In laparoscopic cholecystectomy without energy device surgery, adhesions were divided through avascular planes. Sharp dissection of peritoneal coat was done with scissors and Maryland forceps used to dissect anterior and posterior of Callot's triangle. When electro-surgical coagulation is used, it sometimes spread to surrounding structure and causes damage in separation of Gall bladder from liver bed. Avoidance of using energy source and strict adherence to avascular planes of loose areolar tissue facilitates bloodless separation of Gall bladder from liver bed. Thus avoiding use of energy source is enhancing patient safety.⁴ Study done by Brij B. Agarwak shows less complication which is comparable to our results.⁴

CONCLUSION

Laparoscopic cholecystectomy can be done without using any energy source with enhanced safety and avoiding

thermal injury. This method should be used by laparoscopic surgeon to minimize complication rates.

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