

Three Port Versus Four Port Laparoscopic Cholecystectomy

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Abstract

Objective: The objective of this study is to compare the outcome of three vs four port laparoscopic cholecystectomy and detect safety of three port laparoscopic cholecystectomy (LC) as routine procedure. **Study Design:** Simple comparative study. **Setting:** One year starting from June 2010 to May 2011. **Sample size:** 100 patients **Methods:** All patients were divided into two groups. Group A: three port laparoscopic cholecystectomy was done. Group B: Conventional four port laparoscopic cholecystectomy was done. Outcome is determined in terms of postoperative pain (determined by visual pain scale) and complications (bleeding, infection, bile duct injury). **Results:** 35 patients in Group A had low pain score and 15 were high pain score. In group B, 24 had low pain score and 26 high pain score.

In group A only 10 patient needed nalbuphine as compared to 35 patient in group B. Both groups have almost same operating time (48.5min A and 48min B). Hospital stay is same (48h). Complications like port site bleeding (2 patient in A and 4 in B), wound infection (2 in A and 3 patients in B), abdominal pain (3 in group A and 4 in group B) of three port laparoscopic cholecystectomy are comparable with four port cholecystectomy. No patient in both groups suffered bile duct injury. **Conclusion:** The three-port technique is as safe as the standard four-port for LC. The main advantages of the three-port technique are that it is less painful, safe, less chances of wound infection and leaves fewer scars. **Key Words:** Laparoscopic cholecystectomy – three port cholecystectomy, four port cholecystectomy.

INTRODUCTION

Since its foundation in 1987 by Philip Mouret of Lyon, laparoscopic cholecystectomy (LC) has been the procedure of choice for symptomatic gall bladder disease¹⁻³. Since then, there have been many changes and improvements in the technique. Traditional LC is performed using four-port technique. Reducing the size or number of ports did not affect the safety of the procedure and further enhanced the advantages of laparoscopic over open cholecystectomy. These modifications actually reduced the pain and analgesia requirement⁴. Published data showed that three-port technique didn't compromise the procedure's safety^{5,6,7}. Reduction in analgesia requirement and cosmetic benefits were a common conclusion. In this comparative study we compared the safety, outcome, and advantages between three-port and four-port LC in acute cholecystitis (AC) and chronic cholecystitis (CC).

OBJECTIVE

The objective of this study is to compare the outcome in three and four port laparoscopic cholecystectomy prospectively and detect safety of three port laparoscopic cholecystectomy as routine procedure.

HYPOTHESIS

Three-port LC is a safe procedure for AC and CC in expert hands.

MATERIALS AND METHODS

Study Design

Simple comparative study

Setting

60 bedded surgical unit-1 of Allied Hospital Faisalabad, tertiary care unit 1500 bedded Hospital.

Duration of Study

One year starting from June 2010 to May 2011.

Sample size

Total of 100 patients

Group A: Three port laparoscopic cholecystectomy was done.

Group B: Conventional four port laparoscopic cholecystectomy was done.

Sample Technique

Simple random sampling

SAMPLE SELECTION

Inclusion Criteria

1-All patients between 15-60 years of age having acute cholecystitis, chronic cholecystitis and cholelithiasis

Exclusion Criteria

1. Patients not willing for laparoscopic cholecystectomy
2. Patients below 15 years and above 60 years
3. Suspected presence of common duct stones
4. History of jaundice
5. History of gallstone pancreatitis

OPERATIONAL DEFINITIONS

Outcome: It is determined in terms of pain and complications. Post operative pain was assessed by pain scale (1-10). Score 1-3 taken as low pain score (mild), and 4-10 (moderate and severe) taken as high pain score.

Operative Procedure

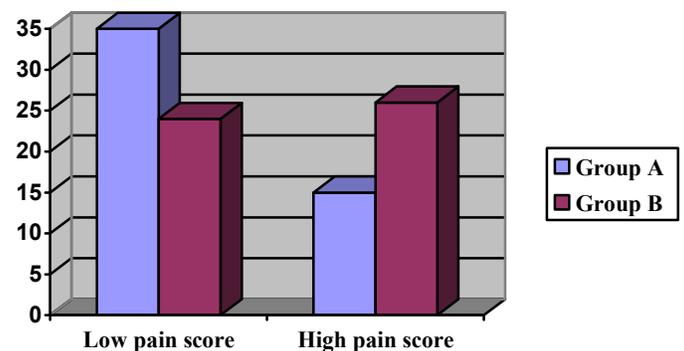
Laparoscopic Cholecystectomy Techniques

The three-port technique involves inserting a 10 mm trocar through or just above the umbilicus using the closed / open technique through which the camera was introduced. Another 10 mm trocar was inserted 3 cm below the xiphisternum; and finally, a 5 mm trocar in the right hypochondrium anterior axillary line 3 cm below the costal margin. The operating surgeon conducted the procedure from the left side of the patient together with the assistant holding the camera while the TV monitor was located on the upper right side of the patient and the nurse on the lower right side of the patient. The operating surgeon holds the dissecting instruments with his right hand through the 10 mm trocar while holding the gall bladder at the infundibulum with a grasper through the 5 mm trocar,

moving the infundibulum right and left or back and forth to display Calot's triangle, blunt dissection was used for adequate display of the cystic duct and cystic artery. The cystic duct was then clipped and divided followed by the cystic artery. The gall bladder was then dissected from its bed and extracted from either the umbilical or the subxephesternal ports. During Conventional 4 port Laparoscopic Cholecystectomy (4 ports L.C) four ports are inserted into peritoneal cavity: One 10mm optical port through the umbilical area. Another 10mm operating port on the epigastria area 5mm operating port on the right hypochondrium and 5mm assistant port on the right iliac fossa. Usually the fundus of gall bladder is grasped and flipped upward then dissection of the cystic pedicle is begun. Cystic duct and artery are ligated and gallbladder separated from the liver bed and extracted through the 11mm operating part.

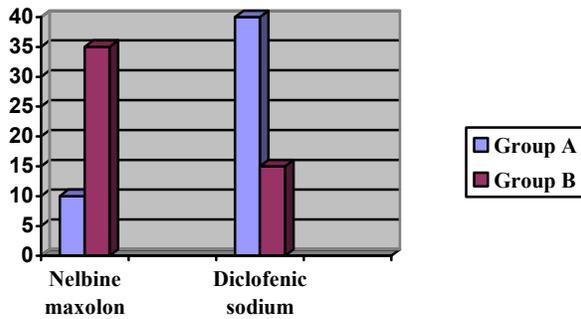
RESULTS

Figure-1 Pain Score



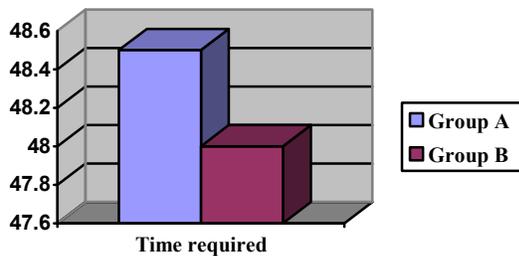
Visual pain scale (1-10) was used. Score 1-3 taken as low pain score (mild), and 4-10 (moderate and severe) taken as high pain score. 35(70%) patients in group A were having low pain score while 15(30%) were having high pain score. While in group B 24(48%) patients were having low pain score and 26(52%) were having high pain score.

Figure-2
Analgesia Required



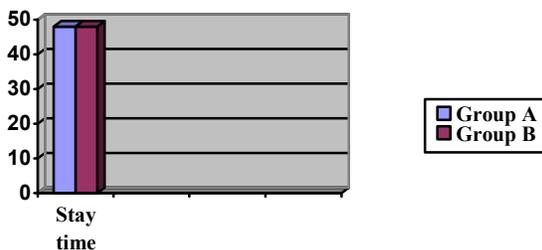
In group A 10(20%) patients required high potency analgesia nalbine maxalone while 40(80%) patients required diclofenic sodium for relieve of pain. While in group B 35(70%) patients required nalbine maxalone while 15(30%) patients diclofenic sodium.

Figure-3
Operating Time



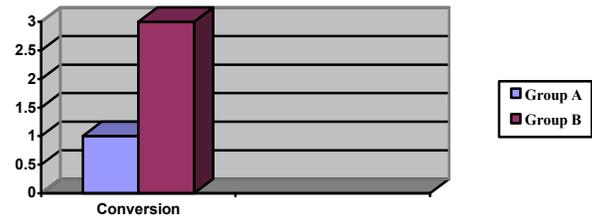
Operating time was almost same with a very little difference that three port laparoscopic cholecystectomy took on an average 48.5 min while four port laparoscopic cholecystectomy took 48 min.

Figure-4
Hospital Stay



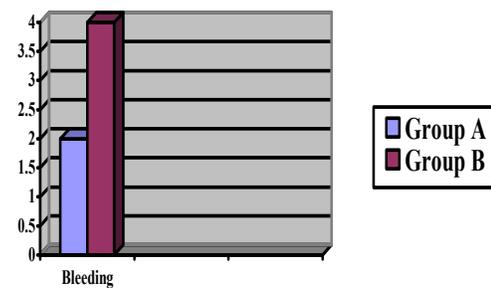
It was same in both groups that was 48 hours.

Figure-5
Postoperative Complications
A-Conversion to Open Cholecystectomy



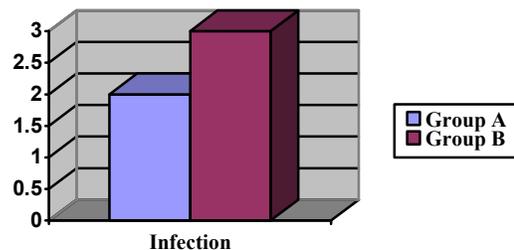
Only 1(2%) patient in group A required conversion to open cholecystectomy while in group B 3(6%) patients required conversion into open cholecystectomy.

Figure-6
B-Port Site Bleeding



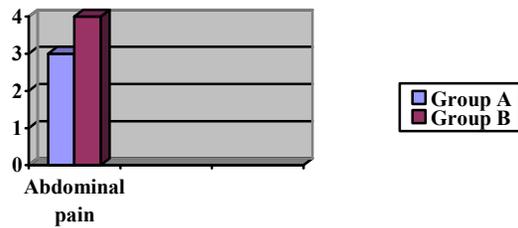
2(4%) patients in group A developed port site bleeding, while 4(8%) patients in group B developed port site bleeding.

Figure-7
C-Wound Infection



2(4%) patients in group A developed wound infection while 3(6%) patients in group B developed wound infection.

Figure-8
D-Abdominal Pain



3 (6%) patients in group A developed abdominal pain while 4(8%) in group B developed abdominal pain.

DISCUSSION

There has been many modifications in laparoscopic cholecystectomy techniques. The use of fourth trocar which is generally used for fundus retraction is thought to be unnecessary. Keeping this in our mind, we have designed a comparative study of three vs four port laparoscopic surgery and our results obtained are quite comparable with international published data. Post operative pain is always a challenge for surgeons. We in our present study find it out that three port laparoscopic cholecystectomy is associated with low postoperative pain. Similar result was shown by a study conducted in Ireland⁸. Another study conducted in Nepal also favour our results⁹. As mentioned in a study¹⁰, we have seen that three port laparoscopic cholecystectomy has the same Hospital stay and success rate as four port surgery.

The most important aspect of any surgical procedure is its safety and complications. We in our study claimed that three port laparoscopic surgery is a safe procedure. Our claim is supported by a number of studies^{11,12,13,14}. Not a single case required fourth port to complete the procedure. On the other hand conversion rate to open cholecystectomy is same as that in four port cholecystectomy. Complications (bleeding, infection) are comparable to four port cholecystectomy. We don't come across any serious bile duct injury in our procedure.

Most recent studies done in Nepal¹⁵ and India¹⁶ also declare three port laparoscopic surgery safe and having few scars. In the due course of our study whenever we offered a patient three port surgery the idea of having few scars on abdomen made them smile.

CONCLUSION

The three port technique is as safe as the standard four port for laparoscopic cholecystectomy. The main advantages of the three port technique are that it is less painful, safe, and leaves few scars.

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