



Minilap grasper versus traction suture for hartmann's traction in two port laparoscopic cholecystectomy: A comparative study.

Kuldip Singh

Associate Professor Department of General Surgery Government Medical College, Patiala Corresponding Author

Varun Nagpal

Junior Resident Department of General Surgery Government Medical College, Patiala

Ashok Kumar

Professor Department of General Surgery Government Medical College, Patiala

KEYWORDS :

Introduction

Cholecystectomy is the commonest operation of the biliary tract and the second most common operative procedure performed today.[1] The conventional laparoscopic cholecystectomy is done by four ports; a 10mm optical port at umbilicus, a 10mm and a 5mm port in epigastrium and in the midclavicular line, respectively for the surgeon to work, and a 5mm port in the mid axillary line at the umbilical level for the assistant to retract the gallbladder fundus. With increasing experience, laparoscopic cholecystectomy has undergone many refinements including reduction in the port size and number. In the experience of the proponents, three-port laparoscopic cholecystectomy is technically acceptable.[2] With further evolution of the technique and increase in surgical experience, some surgeons tried laparoscopic cholecystectomy via two ports only. This required the introduction of transabdominal sutures through the anterior abdominal wall for retracting the gallbladder while dissection.[3] One suture for fundal traction and other for the hartmann's pouch, this can also be accomplished using the minilap grasper.

Transabdominal suture is one of the technique used for providing temporary traction to organ like gallbladder . This technique of transabdominal suture requires placement of suture through the abdominal wall, through the target organ, and then back through the abdominal wall, allows the suture to be clamped outside the abdomen on appropriate traction .This technique may obviate the need of additional trocar for purposes of traction, decreasing morbidity and freeing both the hands of surgeon and allows the traction as per need.

The minilap percutaneous instrument, which provides access and instrumentation in one, retention of abdominal pressure and with no surgical incision closure necessary. The stainless steel instrumentation tip and stabilizing pivot disc provide strength to secure, retract and manipulate soft tissue and organs with minimal damage to tissue.[4] The motive of this study was to find out which is better for hartmann's traction minilap grasper or hartmann's traction suture in two port laparoscopic cholecystectomy.

AIMS AND OBJECTIVES

To compare minilap grasper versus traction suture for hartmann's traction in two port laparoscopic cholecystectomy in terms of:

- Operative time
- Ease of use and acceptability
- Hospital stay time
- Grasper/suture site pain
- Grasper/suture site infection
- Any complications

Material and Methods

A total of hundred patients of either sex admitted to surgical wards of Rajindra Hospital Patiala, Punjab for laparoscopic cholecystectomy were taken up for the study.

All patients were randomly assigned into two groups of 50 patients each:-

Group A: Patients in whom minilap grasper was used for traction.

Group B: Patients in whom hartmann's traction suture was used for traction.

INCLUSION CRITERIA

- Acute cholecystitis
- Chronic cholecystitis
- Gall bladder polyp > 1cm
- No clinical or biochemical or ultra-sonographic evidence of CBD stones.
- Informed consent.

EXCLUSION CRITERIA

- Bleeding disorder
- Pregnancy
- Unfit for general anesthesia.
- Patients not giving consent.

Procedure

All patients underwent laparoscopic cholecystectomy using two port laparoscopic technique under general anesthesia. A nasogastric tube was inserted and stomach aspirated. The veress needle was inserted through a stab incision in supraumbilical region with the patient in 15 degree trendelberg position and pneumoperitoneum was created. Trocar along with cannula introduced into the peritoneal cavity and telescope was introduced through the cannula. Table was lifted, head end up and right side up, then 10 mm working port in sub-xiphoid area was put. The gall bladder was strategically manipulated using transabdominal fundal suture. In Group A patients, the minilap grasper which is 2.3mm in diameter was inserted into abdominal cavity by giving small stab incision in the subcoastal plane at mid clavicular line without conventional abdominal laparoscopic port and was used for giving traction to the neck of gall bladder. In Group B patients hartmann's transabdominal traction suture in the same area was used for giving traction to neck of gall bladder. Dissection of calots triangle was done and the junction of cystic duct and gall bladder was defined. Two proximal and one distal stainless-steel clips was applied on cystic duct and artery and both of them are cut in between the clips. The gall bladder was removed from liver bed with cautery. The gall bladder was extracted through the epigastric port. Operative time from onset of procedure (i.e. time since incision was given) to closure of wound was noted. Any intraoperative complications will be recorded. Post-operative assessment regarding temperature, BP, pulse, post-operative pain was noted. Hospital stay and cosmesis was noted. The findings noted down for the patients in two subgroups was compared and results were evaluated at the end of study.

Results

Majority of the patients in both the groups were females (80% in group A and 88% in group B). The mean age in the group A was 40.96 years and the mean age in group B was 43.18years. Multiple gall bladder stones were present in majority of patients (78% in group A ,72% in group B). Intraoperatively, in group A 5 patients had dense adhesions ,1 patient had an empyema ,2 patients had mucocele and in the group B 1 patient had dense adhesions,3 had mucocele. There was no laparoscopic conversion to open cholecystectomy but extra port was required in one patient in each group.

The mean time for surgery was comparable with no significant statistical differences (Table 1).

Operative time	Min	Max	Mean	S.D	P value	Significance
Group A	25	60	44.30	9.58	0.421	NS
Group B	20	80	46.70	14.62		

(Table 1)

The 50% of the patients in group A and 70% of patients in group B were operated without the requirement of drain, however 22% of group A and 10% of group B patients require the drain for 2 days. The overall requirement of drain was comparable between the two groups (p value 0.101) (Table 2).

Drain Placed	Group A		Group B		P value	Significance
	Number	Percentage	Number	Percentage		
No	25	50.0	35	70.0	0.101	NS
Day 1 Removed	14	28	10	20.0		
Day 2 Removed	11	22	5	10.0		
Total	50	100.0	50	100.0		

(Table 2)

The stone spillage was not present in both the groups, however there was significant differences in the bile spillage in the groups with 26% of group B patients and 8% patients in group A. The differences between the two groups was statistically significant (Table 3).

BILE SPILLAGE	Group A		Group B		P value	Significance
	Number	Percentage	Number	Percentage		
No	46	92.0	37	74.0	0.017	S
BS	4	8.0	13	26.0		
SS	0	0.0	0.0	0.0		
Total	50	100.0	50	100.0		

(Table 3)

Two percent in each group had pain at the grasper site or at the suture site insertion. In group A 8% had infection at the grasper insertion site whereas none of the patient in group B had infection at the suture site insertion. The difference was statically significant with (p value 0.041). The mean hospital stay was 1.52 days in group A and 1.62 days in group B. The mean hospital stay of both the groups were comparable and no statistical differences was found (p value 0.743). The patients were discharged when they were relieved of pain and were fit enough to manage their personal routine (Table 4). No significant difference in cosmesis was seen between the two groups by the end of 1 month.

Hospital Stay	Min	Max	Mean	S.D	P value	Significance
Group A	1	4	1.52	0.71	0.743	NS
Group B	1	4	1.62	0.85		

Discussion

The introduction of laparoscopic cholecystectomy proved to be a new era in the management of cholelithiasis. Since the performance of the first laparoscopic cholecystectomy by Prof Dr. Med Erich Mühe of Germany in 1985, this procedure overtook open cholecystectomy as the treatment of choice in cholelithiasis. [5] Once the safety of laparoscopic cholecystectomy was established, surgical interest has focused on reducing the invasiveness and scarring caused by the procedure. Numbers of different techniques are developed and are being used by laparoscopic surgeons all over the world. Ramachandran CS et al modified the procedure of laparoscopic cholecystectomy and introduced a new innovative two-port method of gallbladder removal. Between September 1997 and November 1997, 50 consecutive patients (41 females and 9 males; mean age 41 years) with calculus cholecystitis underwent our new two-port procedure. In this operation, only the supraumbilical port (10 mm/5 mm) and the epigastric port (10 mm) were used for access. The gallbladder was manipulated through three strategically placed traction sutures, passed through the fundus, the body, and the neck area of the gallbladder, respectively. The operating time required was 35 to 125 minutes, with an average time of 56 minutes. None of the patients required conversion to the four-port technique. All patients were on liquids after 6 hours. The average hospital stay was 1.31 days. Postoperative pain was significantly reduced, and the procedure was cosmetically more acceptable to the patient. [6]

Leggett PL et al conducted a study of Minimizing ports to improve laparoscopic cholecystectomy in which he concluded that reducing the

number and size of ports in laparoscopic cholecystectomy sustains or enhances the improvements initiated by performing laparoscopic rather than open cholecystectomy. In a comparison of micro laparoscopic procedures, patients undergoing the procedure with the shorter incisions experienced significantly less pain. [7]

In the study by Poon et al it was concluded that two-port laparoscopic cholecystectomy resulted in less individual port-site pain and similar clinical outcomes but fewer surgical scars compared to four-port laparoscopic cholecystectomy. They suggested that it can be recommended as a routine procedure in elective laparoscopic cholecystectomy. [8] Sarli et al concluded that mini laparoscopic cholecystectomy (MLC; three 3-mm ports and one 12-mm port) took a similar time to perform and caused less postoperative pain than the standard laparoscopic cholecystectomy (LC; one 10-m port, one 12-mm port and two 5-mm ports) reducing the port size further enhanced the advantages of laparoscopic over open cholecystectomy.[9] The use of mini-laparoscopic techniques resulted in decreased early postoperative incisional pain, avoided late incisional discomfort, and produced superior cosmetic results. Although improved instrument durability and better optics are needed for widespread use of miniport techniques, this approach can be routinely offered to many properly selected patients undergoing elective LC. [10] McCloy R et al conducted a study comparing the effects of minilaparoscopic and conventional laparoscopic cholecystectomy on patient outcomes and concluded that reducing the size of trocar incision results in some limited improvements in surgical outcomes after LC with higher risk of conversion to open cholecystectomy than conventional laparoscopic cholecystectomy. [11] S Sreenivas et al conducted a study of two-port mini laparoscopic cholecystectomy compared to standard four-port laparoscopic cholecystectomy in which following the placement of umbilical port, instead of a 10-mm, a 5-mm epigastric port was placed and concluded that less requirement of analgesia and the early return to their activities in the two port mini LC in contrast to the four port LC, the cosmetic score was significantly better in two port mini LC, which is similar to other studies where cosmetic benefit was studied. [12]

In our study, the mean operative time to complete the surgery was less in group A as compare to group B but was comparable. The overall requirement of suction drain was comparable in both the groups. Intraoperative bile spillage was significantly higher in group B as compare to group A due to piercing of the gallbladder wall by suture. The incidence of pain at the grasper site was comparable with the pain at the suture insertion site. The incidence of infection at the grasper site was significantly higher as compare to that at suture site but the cosmesis at the end of 1 month was comparable and was insignificant. The use of minilap grasper for the purpose of traction seems to be more feasible by the surgeon as it not only decreases the time for the procedure but also provides the multidirectional traction with the less incidence of bile spillage but the cost was significantly more as compare to suture.

The main advantage of two-port mini LC is the ease of performing the technique and principles of surgery remain similar to the conventional four-port LC. Compared to this, other reduced port surgeries such as NOTES and SILS are technically more demanding as dissection becomes more difficult due to clashing of instruments, loss of normal triangulation, restricted vision and depth of dissection. [13,14,15] Special large port, angulated instruments and scopes are needed for better dissection. All these factors lead to a steeper learning curve, and hence, operating time. [15] Two-port mini LC using conventional instruments can afford the benefits of reduced port surgeries without cost escalation. SILS or Single Port-Access [SPA] proposes to offer an even better cosmesis since it leaves no visible scar as it is hidden in the umbilicus. However, Special large port, angulated instruments and scopes are needed for better dissection. All these factors lead to a steeper learning curve and increase the risk of wound-related complications including hernia formation. [15]

Two-port mini LC scores over the conventional techniques as it requires minimal new instruments and can be performed at all laparoscopic centres without any new cost inputs, and simultaneously achieve the goal of minimal access surgery.

In two-port mini LC, compared to SILS, surgery becomes much easier due to restoration of triangulation, learning curve becomes shorter, causes minimal violation of anterior abdomen leading to lesser post-

operative pain and cosmesis is comparable[8]. The need for more sophisticated instruments escalates the cost of surgery and limits the use of these minimally invasive techniques to a few centres. We conclude that both the things(Grasper/Suture) are equally good with certain advantages of each of them. A surgeon should be well versed in using both the techniques Two port laparoscopic cholecystectomy is a feasible, safe procedure to deal with gallstone disease and should be considered as a routine to start with.

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