POST OPERATIVE WOUND INFECTION IN UNCOMPLICATED LAPAROSCOPIC CHOLECYSTECTOMY WITH AND WITHOUT A DRAIN

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ABSTRACT

Objective: To compare the frequency of wound infection with and without subhepatic drain in patient's undergoing laparoscopic cholecystectomy.

Study Design: Randomized controlled trial.

Place and Duration of Study: Study was carried out at department of Surgery, Combined Military Hospital (CMH) Lahore, from Nov 2014 to Apr 2015 over a period of six months.

Material and Methods: This study included a total of 140 patients (70 in each group). In group A, a drain was placed in subhepatic space after laparoscopic cholecystectomy and no drain was placed in group Bafter laparoscopic cholecystectomy.

Results: In our study, out of 140 patients (70 in each group), patients in the age range of 20-50 years were 61.43% (n=43) in group-A and 57.14% (n=40) in group-B while those in the age range of 51-70 years were 38.57% (n=27) in group-A and 42.86% (n=30) in group-B. Mean ± SD was found to be 46.34 ± 7.54 and 46.23 ± 10.34 years respectively. About 28.57% (n=20) in group-A and 22.86% (n=16) in group-B were male while 71.43% (n=50) in group-A and 77.14% (n=54) in group-B were females. Wound infection was compared in both groups which showed that 18.57% (n=13) in group-A and 7.14% (n=5) in group-B had wound infection. A *p*-value was calculated as 0.04 which was significant.

Conclusion: We concluded that the frequency of wound infection with subhepatic drain in patients undergoing laparoscopic cholecystectomy was found significantly higher when it was compared to cases without drain.

Keywords: Laparoscopic cholecystectomy, Subhepatic drain, Wound infection.

INTRODUCTION

Among the gastrointestinal surgeries, the most commonly performed surgery is appendicectomy after which the second one is cholecystectomy. It is considered as the treatment of choice though lithotripsy and dis solution therapy are also offered[1-3]. Carl Langenbach performed first open cholecystectomy in 1982 and stated that gall bladder requires removal not because of the reason that it contains stones but due to the fact that it is the source of formation of stones[4,5], Open cholecystectomy remained the operation of chioce for about a century[4]. But now laparoscopic cholecystectomy is considered as the preferred treatment beccause of less post operative pain, smaller incisions, short hospital stay and early return to work[1,6-8].

Placing drains regularly remained in practice for a prolonged period of time[4]. But nowadays based on personal bias and experience surgeons are divided on the issue regarding drain placement after uncomplicated laparoscopic cholecystectomy[6]. The benefit of drainuse after laparoscopic cholecystectomy is that it prevents collection of blood and bile which may require subsequent open procedures[1,9]. Prevention of subhepatic collection may justify the use of drain in avoiding post operative collection[1]. Another advantage of placing a drain is that it allows CO_2 insufflated during laparoscopy to escapeand reduces shoulder pain[6,10]. However data regarding using drains in laparoscopic cholecystectomy is still limited[1]. El-labban *et al* showed that wound infection in patients with drain is more

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(18.75%) than in patients with no drain (5%)[6]. In the study of Rathi *et al* there was no wound infection in either group[9,11]. Increased morbidity is associated with the use of drains so the surgeon undertaking the operation can best assess whether a drain should be placed or not[9,12].

As results of different studies are not the same and surgeons follow their beliefs on this debate, there is a requirement that more studies are carried out. The only chance of finally settling the controversy is the long term randomized controlled study.

This present study wascarried out to evaluate the difference regarding wound infection after uncomplicated laparoscopic cholecystectomy with and without drain inlocal population. The study results can help in reducing the burden of antibiotic use. The results of study when communicated to surgical departments where laparoscopic cholecystectomy is being practiced, the more effective method with regard to placing or not placing a drain to avoid post operative wound infection can be adopted.

MATERIAL AND METHODS

This randomized controlled trial was carried out at department of Surgery, Combined Military Hospital Lahore over a period of 06 months from Nov 2014 to Apr 2015. Sample size was calculated to be 140 (70 in each group) by WHO sample size calculator using level of significance 5%, power of test 80, anticipated population in group A 18.75% and anticipated population in group B 5%[6]. Patients who were included in the study were those of both genders with age between 20-70 years who had uncomplicated laparoscopic cholecystectomy. Patients who had acute cholecystitis, pancreatitis, peritonitis, cholangitis, choledocholithiasis, chronic liver disease or bleeding disorder, carcinoma gall bladder and pregnancy were excluded from study. All patients reporting to surgical OPD with clinical features suggestive of gall bladder disease were evaluated by history and clinical examination. Ultrasound abdomen, liver function tests and blood complete picture were done. On the basis of history, clinical examination and investigations, a list of patients needing laparoscopic cholecystectomy was made. These patients were informed about the study. Those willing and fulfilling inclusion criteria were included in the study and informed written consent was taken. Pre-operative baseline investigations and pre-anaesthesia assessment was done. Patients were randomized into two equal groups by lottery method; group A contained cases with drain placed in subhepatic space and brought out through anterior axillary port and group B contained cases without drain. Post-operatively patients were followed in OPD on 7th post operative day and wound infection was measured by Southampton wound grading system.

Statistic analysis was performed by SPSS 18. Quantitative variables such as age was measured as mean and SD. Qualitative variables such as gender and infection were measured through frequency and percentage. Comparison of infection between drain and non drain group was done through Chi square test. A *p*-value <0.05 was significant. Control of effect modifiers such asgender and age was done through stratification. Chi-square test was used after stratification and *p*-value <0.05 was kept significant.

RESULTS

Totally 140 cases (70 in each group) fulfilling the inclusion/exclusion criteria were enrolled to compare the frequency of wound infection with and with out subhepatic drain in patients undergoing laparoscopic cholecystectomy.

Distribution of age was done which showed that patients in the age range of 20-50 years were 61.43% (n=43) in group-A and 57.14% (n=40) in group B while those in the age range of 51-70 years were 38.57% (n=27) in group-A and 42.86% (n=30) in group-B. Mean Age ± SD was found to be 46.34 ± 7.54 and 46.23 ± 10.34 years respectively (table-I).

Patients distribution was done according to gender which showed that 28.57% (n=20) in group-A and 22.86% (n=16) in group-B were male

while 71.43% (n=50) in group-A and 77.14% (n=54) in group-B were females (table-II).

Wound infection was compared in both groups which showed that 18.57% (n=13) in group-A and 7.14% (n=5) in group-B had wound infection while remaining 81.43% (n=57) in group-A and 92.86% (n=65) in group-B had no wound infection, *p*-value was calculated as 0.04 (table-III).

Table-I: Age distribution (n=140).

Age (in years)	Group-A(n=70)		Group-B(n=70)	
	No. of patients	Percentage (%)	No. of patients	Percentage (%)
20-50	43	61.43	40	57.14
51-70	27	38.57	30	42.86
Total	70	100	70	100
Mean ± SD	46.34±7.54		46.23±10.34	

p-value = 0.000259

Table–II: Gender distribution (n=140).

Gender	Group-A(n=70)		Group-B(n=70)	
	No. of patients	Percentage (%)	No. of patients	Percentage (%)
Male	20	28.57	16	22.86
Female	50	71.43	54	77.14
Total	70	100	70	100

p-value = 0.44

Table-III: Comparison of frequency of wound infection in both groups (n=140).

Wound infection	Group-A(n=70)		Group-B(n=70)	
	No. of patients	Percentage (%)	No. of patients	Percentage (%)
Yes	13	18.57	5	7.14
No	57	81.43	65	92.86
Total	70	100	70	100

p-value= 0.04

DISCUSSION

Cholelithiasis is a highly prevalent disease and is present in about 10 to 15%of the adults all over the world. It is more commonly found in women who have obesity and multiple pregnancies. Adults are more commonly affected as compared to children and elderly population. Similarly females are more commonly affected than males. Cholecystectomy is one of the most common elective abdominal operations. Thoughat present the gold standard is laparoscopic cholecystectomy but open cholecystectomy is still being practiced as an effective alternative in developing countries because of economic restraints. Open cholecys-tectomy has remained as the standard surgery for the cholelithiasissince the last century but since 1990s, it has been replaced by laparoscopic cholecystectomy and nowadays laparoscopic cholecystectomy is considered as the gold standard operation for gall stone disease[4]. The shift from open cholecystectomy tolaparoscopic cholecystectomy has minimized tissue trauma. This has also considerably decreased the incidence of complications related to wound. Still, few complications are acknowledged such as wound infection and trocar site hernia and have 1% to 22% incidence after all types of operations performed laparoscopically[13,14]. Introduction of single incision laparoscopic surgery (SILS) has further reduced trauma to the abdominal wall as it iseasy to gain straight forward access to the peritoneum through the umbilicus with noobvious scar. Umbilical approach has been approved by many publications not only for the standard but even for the challenging operations. However due to lack of wide spread availability of instruments and

expertise, standard laparoscopic cholecystectomy is in common practice[15,16]. Conventionally, drain placement was carried out in routineas it was believed that drains early recognize any leak of bile and blood and help in evacuation of abdominal fluid collection withno further requirement for invasive measures. Use of drains may be justified by their effectiveness in evacuation of subhepatic fluid collection and thus reducing complications. Conversely, different studies have shown that when a drain is placed in the peritoneal cavity containing no fluid, omentum rapidly surrounds the drain and blocks it completely during 48 hours. Clots and exudates also block the drains shortly following placement in the peritoneal cavity and thus isolate them. It is believed that drains easily drain bile as compared to other abdominal collections. Conversely, large series during the period of open cholecystectomy indicated that drains were placed in most of the patients whose laparotomy was done for peritonitis due to bile leak and it was seen that this complication was not efficiently detected by placement of drains. Similarly, drains do not have an effective role intreating bile leak or hemorrhage in elective laparoscopic cholecystectomy. Furthermore, incidence of fluid collection in subhepatic space is increased by drains after laparoscopic cholecystectomy. This is possibly caused by irritation due to foreign body effect of drain material, prevention of tamponade by the tissues, dead space formation and vacuum suction effect by the drain. Sonographic studies evidently revealed that most of the collections formed after cholecystectomy remain asymptomatic and disappear subsequently due to absorption by the peritoneum. One of the post cholecystectomy complications is infection at port site and placement of a drain seems to increase its incidence, probably due to the foreign body effect. Conversely, when drains were placed for short term after open cholecystectomy there was no related increase in morbidity. There is controversy with regard to post operative pain after placement of subhepatic drain. There is considerable decrease in postoperative pain in patients with no drains as compared to patients in whom drain is placed in subhepatic space. Few studies showed that suction drain placed after laparoscopic cholecystectomy allows escape of carbon dioxide gas and thus reduces shoulder pain as compared to passive drain[1]. Numerous case reports have demonstrated failure of drains to adequately drain bile or pericholecystic abscess[4]. Soin case of absence of bile leak from a drain, interpretation of absence of bile leak can't be made. So, drain placement after cholecystectomy increases morbidity and is, therefore, ineffective and redundant[4].

So there are no precise guidelines for drain placement after laparoscopic cholecystectomy and decision of most surgeons with regard to drain placement depends on their personal belief and experience. Numerous randomized controlled trials have suggested that drain placement has no advantage in elective open and laparoscopic cholecystectomy in nonacutely inflamed cholecystitis.

We planned to assess the difference in wound infection after uncomplicated laparoscopic cholecystectomy with and without drain in local population.

The findings of our study are in agreement El-labban *et al* who showed that wound infection is more in patients with drain (18.75%) than in patients with no drain (5%)[6]. Another study of Rathi *et al* reported no wound infection in either group[9]. Increased morbidity is associated with the use of drains so appropriate judgement regarding placement of drain can be done by the operating surgeon[9]. In 1962 Myers pointed out 'drain fever syndrome' following cholecystectomy[17]. This condition occurs if drain is kept inside peritoneal cavity for more than 48 hours and entails the development of right upper quadrant pain and fever. Cruse and Foord showed five times increased incidence of wound infection in patients with drains placed as compared to those with no drains[18].

It was thought that drains reduce atelectasis through removal of residual gas and infected

debris, so these could be helpful in prevention of post operative fever. Contrary to this, the opposing opinion indicates that drains have no role in obviating postoperative fever[19]. Two factors may possibly be involved in this. Firstly, drain might allow entrance of bacteria and secondly, it can make coughing difficult due to pain at the drain site.

Our results justify the hypothesis that there is a difference in wound infection with and without subhepatic drain in patients undergoing laparoscopic Cholecystectomy. So in our view, no drain should be used in patients undergoing laparoscopic cholecystectomy.

CONCLUSION

We concluded that the frequency of wound infection with subhepatic drain in patients undergoing laparoscopic cholecystectomy was significantly higher when it was compared to cases without drain. So no drain should be used in these patients.

CONFLICT OF INTEREST

The authors of this study have no conflict of interest to report.

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