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Frequency of port site infection following gall bladder removal through Epigastric vs Umbilical port.

1. MBBS, FCPS
Assistant Professor Surgery
GMMMC Sukkur.
2. MBBS, FCPS
Associate Professor Surgery
GMMMC Sukkur.
3. MBBS, FCPS
Associate Professor Surgery
GMMMC Sukkur.
4. MBBS, FCPS
Assistant Professor Surgery
GMMMC Sukkur.
5. MBBS, FCPS
Consultant Surgeon
GMMMC Sukkur.
6. MBBS, MS
Lecturer Anatomy
GMMMC Sukkur.
7. MBBS, DMRD
Consultant Radiologist
GMMMC Sukkur.
8. MBBS, FCPS
Associate Professor Anatomy
Liaqat National Hospital &
Medical College, Karachi.

Correspondence Address:
Dr. Bushra Shaikh
Department of Surgery
GMMMC Sukkur.
bushrashaikhh@gmail.com

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Bushra Shaikh[1], Imamuddin Baloch[2], Azhar Ali Shah[3], Abdul Sami Mirani[4], Parkash Lal Lund[5], Jagdeesh Valbani[6], Nosheen Azhar[7], Saima Athar[8]

ABSTRACT… Objective: To compare the frequency of port site wound infection following gall bladder removal through umbilical and epigastric port in laparoscopic cholecystectomy. **Study Design:** Randomized Control Trial. **Setting:** Surgical Unit 2, Ghulam Muhammad Mahar Medical College, hospital Sukkur. **Period:** 1st November 2019 to 30th October 2020. **Material & Methods:** All cases who underwent four port laparoscopic cholecystectomy were enrolled in two groups. All procedures were performed under general anesthesia. As the last event of surgery gall bladder was retrieved in a glove bag through umbilical port in group A and through epigastric port in group B, both under direct camera vision. Wound infection was considered if there was 3 to 5 grade of wound according to Southampton wound grading system (Figure-1) on 5th postoperative day. All demographics and outcome variables were recorded. **Results:** Age ranged from 20 to 60 years with mean age of 38.875±8.11 years, BMI 29.973±5.12 Kg/m^2, duration of surgery 50.656±8.41 mins and Southampton score was 1.044±1.07 in Group A and mean age of 38.560±6.23 years, BMI 27.437±5.04 Kg/m^2, duration of surgery 48.920±8.67 mins and Southampton score was 0.856±0.92 in Group B. In group A, 18 (5.7%)patients developed port site wound infection in contrast to 5 (1.6%) patients in group B (P= 0.006). **Conclusion:** We conclude that epigastric port retrieval of gall bladder following laparoscopic cholecystectomy results in less port site infection.

Key words: Epigastric Port, Laparoscopic Cholecystectomy, Port Site Wound Infection, Umbilical Port.

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INTRODUCTION

Laparoscopic cholecystectomy has become the gold standard treatment modality for cholelithiasis all over the world and it is the major milestone that minimal invasive surgery has achieved since its inception.[1,2,3,4,5,6,7,8] Port site infection is the most dreadful complication of laparoscopic cholecystectomy which increases the morbidity, delays patient's recovery, prolongs the hospital stay and increases the cost and it has been implicated as a risk factor in the pathogenesis of port site hernia as well.[9] In laparoscopic cholecystectomy, gall bladder is traditionally taken out through umbilical port because it is associated with less postoperative pain and may also be associated with shorter gallbladder retrieval time[10] but practically gall bladder can also be retrieved through epigastric port. Both ports have been recommended for delivery of gall bladder and are always selected as per surgeon's preference.[11] We retrieve gall bladder through epigastric port at our institute.

Rationale of our study is to compare the frequency of port site wound infection after retrieval of gall bladder through umbilical and epigastric port.

Inclusion Criteria

- Patients of all the ages of both gender undergoing laparoscopic cholecystectomy for symptomatic cholelithiasis.
- Any number of stone
- Largest stone 3 cm or less.

Exclusion Criteria

- Patients with co-morbids like diabetes, COPD and steroid taking patients
- Pregnant females
- Patients in whom there is bile spillage during retrieval of gall bladder at the time of surgery
- Patients in whom there was glove bag perforation during gall bladder retrieval

Clear inclusion and exclusion criteria are metioned

MATERIAL & METHODS

A randomized controlled trial comprising of 628 was performed at surgical unit II Ghulam Mohammad Mahar Medical College Hospital All patients undergoing standard four port laparoscopic cholecystectomy were randomly enrolled by sealed opaque envelop method in two groups. Gall bladder was delivered in a glove bag through umbilical port in group A and through epigastric port in group B, both under direct camera vision. All trocars were removed and umbilical and epigastric wounds were closed with Vicryl 0- J shaped needle and skin approximated with prolene 2/0 or stapler. Prophylactic intravenous Injection Ceftriaxone 2g was given to all patients preoperatively and was continued postoperatively up to 24 hours. All patients were discharged on oral Cefixime 400mg once 24 hourly for 5 days.

Wound infection was considered if there was 3 to 5 grade of wound according to Southampton wound grading system on 5th postoperative day. All demographic variables like age, gender, BMI, duration of surgery and outcome variables like Southampton score were recorded.

Data was analysed on SPSS version 17. Frequency of wound infection at epigastric and umbilical port was calculated in percentage. Mean and standard deviation (SD) of age, duration of surgery, Southampton wound grading system and BMI was calculated. The chi-square test was used to compare both groups. P value of ≤ 0.05 was considered statistically significant. Stratification for effect modifiers like age, gender and body mass index was done. After stratification chi square test was applied to see the effect of these on outcome i-e frequency of wound infection in both groups. P value ≤ 0.05 was taken as significant.

RESULTS

Age ranged from 20 to 60 years with mean age of 38.875±8.11 years. Mean values for BMI, duration of surgery and Southampton score are as shown in Table-I.

	Grade	Appearance
0	Normal healing	
I	Normal healing with mild bruising or erythema	A—some bruising
		B—considerable bruising
		C—mild erythema
II	Erythema plus other signs of inflammation	A—at one point
		B—around sutures
		C—along wound
		D—around wound
III	Clear or haemoserous discharge	A—at one point only (<2 cm)
		B—along wound (>2 cm)
		C—large volume
		D—prolonged (>3 days)
IV	Pus/purulent discharge	A—at one point only (<2 cm)
		B—along wound (>2 cm)
V	Deep or severe wound infection with or without tissue breakdown;	

Figure-1. Southampton scoring for wound infection Reference:https://www.researchgate.net/figure/The-Southampton-Wound-Scoring-System-43_tbl3_235729965

Port site infection was seen in 18 (5.7%) patients in group A in contrast to 5 (1.6%) patients in group B (P= 0.006) (Table-II).

Stratification of wound infection for effect modifiers like age, gender and body mass index was done. There is no statistically significant effect of advancing age on frequency of port site infection in group A & B (Table-III). As for as gender is concerned females in both the groups developed more wound infections as compared to males (P-value= 0.003) as shown in Table-IV. Obesity had substantial effect on outcome in terms of port site infection with more patients developing infection whose BMI was > 25 kg/m^2 (Table-V).

	Group A n=314 Mean±SD	Group B n=314 Mean±SD
Age (years)	38.875±8.11	38.560±6.23
BMI (Kg/m^2)	29.973±5.12	27.437±5.04
Duration of surgery (mins)	50.656±8.41	48.920±8.67
South Hampton score	1.044±1.07	0.856±0.92

Table-I. Mean ± SD of age, BMI, duration of surgery and South Hampton score n=628

Port Site Infection		N = 314 Group A	N = 314 Group B	P-Value
1	Yes	18 (5.7%)	5(1.6%)	0.006
2	No	296 (94.3%)	309(98.4%)	
	Total	314 (100%)	314(100%)	

Table-II. Port site infection in group A & B

Age (20-40 years)

Group	Port site infection		P-Value
	Yes	No	
A	12(5.9%)	190(94.1%)	0.031
B	3(1.7%)	178(98.3%)	

For Age group 41-60 years

Group	Port site infection		P-Value
	Yes	No	
A	6(5.4%)	106(94.6%)	0.090
B	2(1.5%)	131(98.5%)	

Table-III. Stratification of port site infection for age in group A & B

For Male Gender

Group	Wound infection		P-Value
	Yes	No	
A	3(2.5%)	116(97.5%)	0.455
B	1(1.1%)	90(98.9%)	

For Female Gender

Group	Wound infection		P-Value
	Yes	No	
A	15(7.7%)	180(92.3%)	0.003
B	4(1.8%)	219(98.2%)	

Table-IV. Stratification of wound infection with respect to gender in both groups

BMI: ≤ 25 Kg/m^2

Group	Port site infection		P-Value
	Yes	No	
A	6(7.8%)	71(92.2%)	0.015
B	2(1.4%)	142(98.6%)	

BMI: > 25 Kg/m^2

Group	Port site infection		P-Value
	Yes	No	
A	12(5.1%)	225(94.9%)	0.081
B	3(1.8%)	167(98.2%)	

Table-V. Stratification of wound infection for body mass index in both groups

DISCUSSION

Removal of gall-bladder following laparoscopic cholecystectomy is an important step which sometimes proves difficult. Extensive research has been done to find an easy way to remove the gall bladder but surgeons still face problem and finally land up in widening of port site. This raises the chance of bleeding, haematoma, infection and port site hernia.[12] Debate regarding the ideal port for removal of gall bladder and the use of endobag still continues.[13] Frequency of gall-bladder perforation and stone spillage following laparoscopic cholecystectomy is upto 36%[14] Gall-bladder perforation and stone spillage are the two most common complications encountered during dissection (75%) and removal (25%) of gall-bladder in laparoscopic cholecystectomy.[15,16] Following perforation of gall bladder, port site becomes contaminated with bile and gall-stones leading to port site infection and rarely an abscess or discharging sinus formation.[17,18] In our study Wound infection was seen in 18 (5.7%) patients in group A in contrast to 5 (1.6%) patients in group B (P= 0.006). According to Ali & Siddiqui and Helme *et al*. the best way to avoid complication of spilled gall-stones and port site contamination is to use an endobag.[19,20,21] Golash however did not use endobag and likewise faced high incidence of port site contamination and gall stone spillage.[22] In current study, 5.7% of group-A patients developed umbilical port infection, while in group-B only 1.6% patients experienced epigastric port site infection. Umbilical port sepsis as reported in few other studies ranges from 1 to 5%.[23,24,25,26] Cemal

Kaya found no significant difference in port-site infection or hernia between two groups.[27] Ali & Siddiqui 2013 reported discharging sinus following laparoscopic cholecystectomy due to gallstone implantation.[18] All possible efforts should be made to remove spilled gall-stones; however this does not necessitate the conversion to open surgery as these spilled stones are harmful in less than 1%.[14]

CONCLUSION

We conclude that gall bladder removal through epigastric port results in less port site wound infection than removal through umbilical port.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Bushra Shaikh	Conception & Design, Collection & assembly & assembly of data.	
2	Imamuddin Baloch	Analysis & Interpretation of data.	
3	Azhar Ali Shah	Analysis & Interpretation of data.	
4	Abdul Sami Mirani	Collection of data.	
5	Parkash Lal Lund	Drafting of article.	
6	Jagdeesh Valbani	Drafting of article.	
7	Nosheen Azhar	Analysis & interpretation of data.	
8	Saima Athar	Statistical expertise.	