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RETROSPECTIVE STUDY OF BILIARY LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY IN DEPARTMENT OF SURGERY, J.A. GROUP OF HOSPITAL, GWALIOR

Surgery

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ABSTRACT

Introduction- We used to afraid to avoid postoperative complication like Biliary leakage after laparoscopic cholecystectomy in our hospitals due to variable factors.first to identify the risk factor and its presentation and management. It is necessary to decrease the morbidity , hospital stay , additional investigation and also to decrease the financial burden on patients. So we designed a study to define the incidence of biliary leakge after laparoscopic cholecystectomy in our hospital in last 5 year also to identify the risk factor.

Methods: This Retrospective study was conducted on 200 consecutive patients admitted in Department of General Surgery J.A. group of hospital and G.R.Medical College, Gwalior during the period of September 2013 to September 2018 . Out of 05 patients developed significant biliary leakage.The method of study consists of scrutinised patients case record who was undergone lap cholecystectomy in Sept 2013 to Sept 2018, G. R. Medical College and J.A. Group of Hospitals, Gwalior.

Result:-

- Overall post-operative complication rate was 11%.which include 2.5 % incidence of biliary leakage
- The factors showing definitive association with increased post and intra operative complication in LC were incresed attack of pain, positive history of previous abdominal surgery,comorbidity, tenderness in right hypochondrium and thickened GB,contracted GB on USG while other study variables were age, gender, palpable GB per abdomen, pericholecystic collection, impacted gallstones and contracted GB failed to show any significant association with billiary leakage.

Conclusion: Based on our results we recommend that identify the variables for difficult laparoscopic cholecystectomy and timely conversion to open cholecystectomy to decrese the morbidity & mortality to the patients and finacial burden.

KEYWORDS

Biliary leak, Laparoscopic cholecystectomy, Gall bladder

INTRODUCTION

Cholelithiasis is most common disease encountered in emergency as well as routine OPD in general surgery department, which creates burden to health care system, thus producing burden over population. Development from large incision to small incision and then open to laparoscopic procedure. The incidence of gallbladder stone has been increasing day by day due to obesity, sedentary lifestyle, stress, over eating, old age, increased fatty diet[1].

There are four major risk factor for development of gallstone formation like Supersaturation of bile, concentration of bile in gallbladder, crystal nucleation, Biliary stasis, gallbladder dysmotility[2] The clinical presentation of acute cholecystitis are RUQ pain, fever, nausea , vomiting, anorexia, murphy sigh, RUQ tenderness, raised ESR, raised TLC. USG is first and most important investigation in acute setting with sensitivity of 89%and specificity of 88%[3].

There were four ports laparoscopic cholecystectomy were used which decreased to three ports and now two ports laparoscopic cholecystectomy than transformation & advanced surgical modality to SILS, NOTES, Robotics assisted surgery but still Gold standard surgical modality is four port laparoscopic cholecystectomy[4].

Laparoscopic cholecystectomy is most common minimally invasive modality for treatment of symptomatic or asymptomatic gallbladder stone with its risk factor. This modality has been gain popularitys among surgeons and patients due to shortened incision size, shortened recovery time, decreased post operative pain, decreased size of incision, shortened hospital stay and regain the early routine activity.

Complications of laparoscopic cholecystectomy are infrequent, but incidenc of biliary duct injury resulting in biliary leakage can occur 10 times more frequently with laparoscopic cholecystectomy than open cholecystectomy[5].

Biliary leakage may occur within 1 week postoperatively, but delayed clinical presentation may occurupto 1 months of post-operative period. The clinical presentation of the patients with a postoperative biliary leak may include right upper quadrant pain, nausea, vomiting, anorexia, and fever. Laboratory findings may include leukocytosis and abnormal liver function tests. Leakage of bile can lead to the formation of a bilioma, i.e., a discrete collection of bile outside the biliary tree. An encapsulated bilioma can develop due to slow biliary leakage that enhanced inflammatory reaction than fibrosis occured in it.Unintended injury to the adjacent structures such as the common hepatic duct,colon,small intestinemay occurthat may require surgical procedure for it.the best diagnostic modality for delineating the anatomy of biliary system are MRCP which are helpful for further management of biliary leakage.

Post-cholecystectomy biliary leaks can occur from injury to the common bile duct, cystic duct stump, or small ducts that drain from the gallbladder fossa directly into the biliary system,abberrent arterial or biliary anomaly . Most of them are managed conservatively.However Other modalities for biliary leakage are pigtail drainage, re exploration, ERCP stenting or need to send to higher centre[6].

The incidence of laparoscopic cholecystectomy biliary leakage or biliary duct injuries can be reduced/minimised by using Intra-operative cholangiogram,sophisticated new generation laparoscopic instruments & dye study[7].

If there has been major CBD injury or trannsection of CBD ,for which Roux-en-Y Hepaticojejunostomy/ choledochojejunostomy arethe better option this can be used along the internal stent that has avoided anastomotic stricture

Our Aim of the study is to find out the incidence of biliary leakage following lap cholecystectomy in our institute as per 5 year patients case record and also find out the risk factor and management of its complication.

AIMS AND OBJECTIVES

1) To study the incidence of biliary leak following laparoscopic

cholecystectomy.
2) To evaluate the risk factors for biliary leak after laparoscopic cholecystectomy.

MATERIAL AND METHODS

This Retrospective study was conducted on 200 consecutive patients admitted in Department of General Surgery J.A. group of hospital and G.R.Medical College, Gwalior during the period of September 2013 to September 2018 . Out of which 5 patients developed significant biliary leakage.

Study Design: Retrospective observational study

Inclusion Criteria

We have included available patients case record of lap. Cholecystectomy & their clinical notes has mentioned as post biliary leaks are more than 100 ml per dayfor 3 consecutive days with abdominal pain, sign & symptom of biliary sepsis and post operative jaundice with elevated alkaline phosphatase level.

Exclusion Criteria

We have exclude those patients case record they underwent for cholecystectomy as a part of some primary operation like Whipple's operation, biliary-enteric anastomosis & case record has mentioned as conversion of laparoscopic to open cholecystectomy.

Operative Technique

All the patients of cholilithiasis admitted in our hospital were prior explained about all the procedures available and their benefits and complications and also about treatment available in our hospital. Patients were operated with different technique with mutual decision of patient and surgeon,than all patients were operated via four port lap. cholecystectomy.

Some patients has developed minor complication which was managed conservatively and those patients has occured significant biliary leakage which was investigated & treated accordingly like Pigtail drainage, ERCP stenting, Re exploration.

Statistical Analysis

All Statistical calculations were done with the help of Chi–Square test with degree of significance <0.5% with SPSS software version 22.0. Results were tabulated and represented by suitable graphs and compared with other similar studies.

OBSERVATION & RESULTS

Following observations were made :-

Table 1 : Age Wise Distribution

Age Group	Number of Patients	Percentage	Biliary patients	Percentage
<20	02	1%	00	00
20-40	130	65%	04	80
>40	68	38%	01	20

Table 2 : Gender Wise Distribution

Gender	Number of Patients	Percentage	Biliary leakage patients	percentage
MALE	21	10.5 %	01	0.5%
FEMALE	179	89.5 %	04	0.2%
TOTAL	200	100 %	05	0.7%

Table 3 : Number Of Episodes Of Pain

Episodes	Number of Patients	Percentage	Biliary leakage patients	Percentage
1 Episode	129	64.5%	02	40
2 Episode	69	34.5%	03	60
> 2 Episode	2	1%	00	00

Table 4 : Tenderness In Right Hypochondrium

Tenderness in right hypochondrium	Number of Patients	Percentage	BILIARY LEAKAGE PATIENTS	Percentage
Present	32	16%	01	3.12%
Absent	168	84%	04	2.3%

Table 5 : Pre-operative USG abdomen

Findings	Number of Patients	Percentage	Biliary Leakage Patients	Percentage
Thickened gallbladder	36	18	03	8.3%
Pericholecystic collection	40	20	03	7.5%
Impacted gallstone at neck	40	20	04	10
Gallbladder distended or contracted	24	12	04	16.6%
Single Stones	26	13 %	02	7.6%
Multiple Stones	174	87 %	03	1.7%

Table 6 : Previous Abdominal Surgery

History of Abdominal Surgery	Number of Patients	Percentage	Biliary Leakage Patients	Percentage
Present	17	8.5%	03	1.5%
Absent	183	91.5%	02	01%

Table 7 : Number Of Cases Had Comorbidity

Co morbidity		Number of Patients	Percentage	Biliary Leakage Patients	Percentage
Present	Diabetes mellitus	11	5.5%	02	40
	Bronchial asthma	04	2%	00	00
	Hypertension	11	5.5%	01	20
Absent		174	87%	02	40

Table 8 : Intraoperative Findings Which Made The Procedure Difficult

Intraoperative findings which made the procedure difficult	Frequency of occurrence	Percentage	Biliary Leakage Patients	Percentage
Difficult Calot's triangle	29	14.5	04	80
Dense adhesion	28	14	04	80
CBD Dilated	08	04	01	20
Vascular abnormality/ Biliary abnormality	23	11.5	04	80
Normal anatomy	160	80	01	20

Table 9: Post Operative Clinical Feature

		Number of Patients	Percentage	Biliary leakage patients	Percentage
Symptoms	Pain	12	6%	05	2.5%
	Fever	19	9.5%	03	1.5%
	Vomiting	10	05%	05	2.5%
	Icterus	2	01%	02	01%
Signs	Shock	01	0.5%	01	0.5%
	Jaundice	02	01%	01	0.5%

The most common reason for biliary leakage after laparoscopic cholecystectomy is frozen Calot'striangle, dense adhesions. In these scenarios, the decision for conversion is prudent step for patient safety and should be taken according to the experience and expertise of the operating surgeon. also no of attack of pain, female gender , DM, multiple gallstones ,previous abdominal surgery ,thicking of gallbladder ,arterial or bilioary anamolies, and use of clip found to be significant in our study.

DISCUSSION

The proportion of post operative complication was 11 % . Biliary leakage was found in 2.5 % in our institute which was higher to Lukas Krähenbühl et al (0.3% higher to 3 percent in severe cholecystitis).

In our study The most commonly involved age group of biliary leakage was 30-37 years (mean age 35.85 years) and M:F ratio was 1:4 while Contrary to **Ammori et al** [10] also showed in their study that age >55 years was significantly associated with longer operating time (>90 minutes), thus resulting in a difficult surgery. Which can increase chances of biliary leakage.

Out of the total 200 patients in the study, 129 had single episode of pain, 69 had two episodes of pain and 2 had more than two episodes.

On chi-square analysis of these observations, the p-value obtained was **0.82 (>0.05).** Therefore no significant association with attack of pain for biliary leakage was present on this study.

Out of the total 200 patients in the study, 17 had history of previous abdominal surgery and 183 had no history of previous abdominal surgery. Among them, 03 underwent biliary leakage after Laparoscopic cholecystectomy. On chi-square analysis of these observations, the p-value obtained was **0.00001(<0.05).** Therefore patients have previous abdominal surgery had significant association was present on this study.

Out of the 200 patients included in this study, 32 had tenderness in right hypochondrium while 168 patients had no such finding. Out of these 32 patients, 05 (3.12%) encountered a biliary leakage (p=0.80) suggesting no significant association between tenderness in right hypochondrium and biliary leakage.

ULTRASONOLOGICAL FINDINGS

We have also compared the preop USG finding with biliary leakage of other author.In our study we have found

- **36** patients had thickened GB wall on USG. Out of them, 03 (8.3%) patients underwent biliary leakage. On analyzing these observations with chi-square test, the p-value obtained was0.08 >0.001 suggesting that no significant association existed between thickened GB and biliary leakage after LC.Contrary to **Ammori et al** [10] also concluded in their study that thickened GB wall was associated with significantly prolonged duration of surgery. **Daradekh et al** [11] also observed that GB wall thickness was a significant factor in predicting a difficult LC
- **40** patients had pericholecystic collection on USG. Out of them, 2 (5%) patients underwent biliary leakage after LC. On analyzing these observations with chi-square test, the p-value obtained was 0.54 suggesting that no significant association existed between pericholecystic collection and difficulty during LC.
- 46 patients had impacted gallstones on USG. Out of them, 04 (10%) patients underwent a biliary leakage after LC. On analyzing these observations with chi-square test, the p-value obtained was **0.46** suggesting that no significant association existed between impacted gallstones and difficulty during LC.
- 24 patients had contracted gallbladder on USG. Out of them, 05 (20 %) patients underwent biliary leakage after LC. On analyzing these observations with chi-square test, the p-value obtained was 0.01 suggesting that no significant association existed between contracted gallbladder and difficulty during LC
- Out of the total 200 patients in the study, 26 were single stone and 174 were multiple stone in the USG abdomen. Among them, 1 had single stone (7.6 %) and 4 had multiple stone (1.7 %) underwent biliary leakage after LC. On chi-square analysis of these observations, the p-value obtained was 0.01Therefore patients had multiple stone had significant association was present on this study .

Other studied sonological parameters like pericholecystic collection, impacted gall stones and contracted gallbladder showed no statistically significant association with difficulty encountered during LC. This was in consistence with findings of **Robinson et al** [9] as explained above.

Comorbidity

Out of the total 200 patients in the study, 26 had comorbidity and 174 had no comorbidity. Among them, 11 had diabetes, 04 had bronchial asthma and 11 had hypertension. Biliary leakage after LC is more common with comorbidity. On chi-square analysis of these observations, the p-value obtained was 0.0017(<0.05).Therefore patients with comorbidity mainly DM had significant association was present on this study.

Intra-operative Findings

- ***Anatomy of Calot's triangle:*** In the studied sample, 29 patients were found to have dense adhesions at Calot's triangle causing difficulty in dissection .
- ***Dense adhesion:*** in the studied sample, *Dense adhesion* occurred in 28 patients intraoperatively.
- ***CBD Diameter :*** *Dilated CBD* was found in 08 patients of all cases.

Vascular injury/Biliary injury: *Vascular injury/Biliary injury* was found in 27 patients leading to a difficult procedure which including short cystic duct (18), Tortous cystic duct (06), aberrant vessels (03) in out of 21 patients.In all patients of biliary leakage 4 out of 5 had abnormal anaotmy which signify that correlation with biliary leakage.

All 05 patients of significant biliary leakage was managed by various modalities including 02 pigtail drainage, 02 ERCP stenting, 01 re exploration.

CONCLUSION

This study was done to investigate the association of certain pre-operative and intra operative variables with difficulty encountered during LC for gallstone disease and prediction of complication like biliary leakage. The results of the present study can be summarized as following:

- The most commonly involved age group of biliary leakage was 30-37 years (mean age 35.85 years) and females outnumbered males in the study sample (M:F = 1:4).
- The proportion of post operative complication was 11 % . biliary leakage was found in 2.5 % in our institute which was higher to **Lukas Krähenbühl et al** [8](0.3% higher to 3 percent in severe cholecystitis)
- The factors showing definitive association with increased post and intra operative complication in LC were incresed attack of pain, positive history of previous abdominal surgery,comorbidity, tenderness in right hypochondrium and thickened GB,contracted GB on USG while other study variables age, gender, palpable GB per abdomen, pericholecystic collection, impacted gallstones and contracted GB failed to show any significant association.
- The most common reason for biliary leakage was intraoperative adhesion ,frozen calots triangle
- The overall post-operative complication rate was 11%.which include 2.5 % incidence of biliary leakage

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