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Surgery

USE OF OVERSIZED CLIP FOR LIGATION OF CYSTIC DUCT ,SURGEONS BEWARE!! CAN GIVE SLEEPLESS NIGHTS LATER ON.

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ABSTRACT **BACKGROUND:** The overall incidence of billiary complications have come down remarkably low over the time due to refined knowledge of anatomy ,revolutionary development of laparoscopic instruments and accessories .Bile leakage is not an unfamiliar situation for surgeons who are routinely performing laparoscopic cholecystectomies.

CASE REPORT: Here we are reporting 3 cases relatively simple to perform but subsequently developed bile leak and formation of billioma .When retrospectively analized cause found was use of oversized clips to ligate cystic duct.

The postoperative bile leak significantly add to the morbidity and mortality of patients.

CONCLUSION: The purpose of reporting these cases is just to bring attention of all surgeons to this preventable cause of bile leak. Use of appropriate size of clips according to diameter of cystic duct to ligate is mandatory to avoid chances of slippage .The standard management is percutaneous drainage of billioma, ERCP Sphincterotomy and stenting.

KEYWORDS : Bile leak, Laparoscopic cholecystectomy, Oversized clip

Introduction

LC is the gold standard treatment for symptomatic gall stone disease and most commonly performed surgery worldwide .Though very simple surgery in hands of expert surgeon but it also has its share of complications .While a surgeon can develop a certain level of expertise by performing a surgery repetitive ,there is nothing" routine " about any surgery.

Bile leakage is an uncommon and agonizing complication of cholecystectomy .It ranges from 0.2-1.5% .(1) Cystic duct stump leak and CBD injury are found at higher incidence in acute setting. The bile may originate from gall bladder bed ,cystic duct or rarely from injury to a major duct .Post cholecystectomy cystic duct stump leak is a preventable cause of bile leak .This could be due to dislodgment of the metal clips .Migration of clip is an added problem .If cystic duct appears oedematous ,inflammed ,thickened ,wide and short and we are using clips it can lead to dislodgement of clips ,use of suction in area of calots posses risk for slippage.(2,4)

Before clipping the cystic duct all surgeons should strive for" critical view of safety".(3,4)

The maneuvers to view critical anatomy are

1) Routine use of 30 degree forward oblique viewing telescope.
2) Firm cephalic traction on the fundus of the gallbladder to reduce redundancy in the infundibulum of the gallbladder and expose the cystic duct.
3) Lateral traction on the infundibulum of the gallbladder to place the cystic duct perpendicular to CBD.
4) Disssection of cystic duct at the infundibulum of the gallbladder.
5) Routine fluoroscopic cholangiography

There are four acceptable techniques for closing the cystic duct If the duct is long and wide ,it can be transacted and a pre tied ligature (an Endoloop)can be applied to cystic duct .Alternatively , two ties can be passed around the cystic in continuity and secured with extracorporeal knotting techniques . Occasionally there is a concern that this technique might narrow the CBD. Under these circumstances, the cystic duct is transacted with an endoscopic stapling device , or it is simply divided and oversewn with an intracorporeal suturing technique(2).

Patients with post operative bile collection presents with pain abdomen , distension of abdomen ,fever loss of appetite or sometimes frank peritonism .Very few bile duct injuries can be detected during intra -operative period ,rest present within few days to few weeks time. Along with routine blood investigations USG abdomen is the first investigation to be carried out .Minor leaks can be treated with drainage alone. Low output drainage (<300ml/day) can be observed and should resolve with in 5-7 days .If the catheter drainage fails to resolve or if the patient has high output drainage (>300ml/day),an ERCP should be performed .Three possibilities exist:(a)duct of Luschka leak that can be treated by sphincterotomy,(b)cystic duct stump leak that can be treated with a transpapillary stent with or without sphincterotomy,or (c) suspected CBD injury.(2)

MRCP is a good investigation to delineate the ductal anatomy.

Bile duct injuries caused by surgeons can be devastating and sometimes fatal.The biggest risk in laparoscopic surgery is having an untrained surgeon.

CASE REPORT

Here we are giving details of three patients who were retrospectively analized to find out the cause for postoperative bile leak.The first patient was a 27 years old lady with h/o billiary colic for 6 months .There was no h/o jaundice or previous surgery .Blood investigations revealed no abnormality.Serum ALP was 54 I/u.USG Abdomen revealed well distended gallbladder with normal wall thickness with few calculi of 6-8 mm size,CD diameter 3mm. Patient was posted for surgery at number 4 in OT list.

Intra -operatively GB was well distended,no adhesions,critical view of safety was obtained .Though the cystic duct was of small size(3mm) ,but ligated with large size of clip because of non availability of medium size clip in hospital supply. The procedure was performed within 35 min with no significant blood loss and need for saline wash .No drain was put .Patient was discharged on 2nd postoperative day .She came for stitch removal on 7th postoperative day and went back from OPD .After going back patient developed slight abdominal discomfort but she ignored,on 11th day when problem increased with one episode of fever she reported to surgery emergency .O/E she was having tachycardia ,fullness and tenderness in lower abdomen .Bowel sounds were present.TLC was 11000/cumm,USG revealed moderate collection in pelvic cavity .Needle aspiration revealed bilious fluid,after that USG guided abdominal drain was put which drained 550ml of bilious fluid stat and 200ml in next 12 hours.IV antibiotics were added,fluids supplemented. Bile output was charted ,after a week output was minimal (<50 ml),patient was discharged with drain and advice to monitor the drain output and to report in OPD. Meanwhile the MRCP done on 15th postoperative day demonstrated cystic duct stump leak.Patient again attended OPD with slight pain and decreased appetite,the drain output was minimal but USG reported collection in GB fossa and pelvic cavity ,drain was revised ,there was omentum blocking the drain mouth, reinsertion of drain removed 600 ml of bilious fluid. .Date was taken for ERCP . On 19th postoperative day ERCP and stenting was done .Patient was discharged with in 2 days of ERCP once output was NIL.

With in same time frame we had one lady aged 30 yrs with symptomatic Gall stone diseae for LC .Duration of symptoms 3months with no h/o jaundice or previous surgery.Patient was 2nd in OT list and intra -operative period uneventful with clear anatomy .Procedure completed in 38 min time and LT 400 was used for ligating CD instead of LT 300 just because of nonavailability.Patient was not discharged on next day as she was not relieved of pain.She was taking orally but abdomen was tender .Once she developed distention of abdomen and nausea oral intake was restricted .She was kept nill per mouth with intravenous fluid supplementation.USG abdomen revealed moderate ascites. Needle aspiration showed bilious nature of fluid.USG guided abdominal drain was put and 400ml of fluid drained out. MRCP was ordered which showed cystic duct stump leak. Drain out put was measured daily it was 150ml,100ml ,75ml and 50 ml on subsequent days.Patient was taking orally and passing flatus and stools.Drain was taken out once the discharge was NIL for almost 3days and follow up USG showed no collection.Patient was discharged on 11th postoperative day.

The third patient aged 23 also with symptomatic gall stone disease with duration of symptoms for 8 months.Patient was workedup planned for LC.Intraoperatively GB was well distended with no adhesions cystic duct and artery well delineated and reported for suture removal on 8th day .She complained of abdominal pain which relieved on taking oral painkillers and dislike for food.On P/A examination distention was noted with mild tenderness .Patient was having stable vitals .USG abdomen was ordered which demonstrated fluid,needle aspiration showed serous fluid with bile tinge.Under radiological supervision abdominal drain was inserted that drained 650ml of serous fluid .Subsequently the drain fluid was bilious.

On abdominal drain output monitoring it was high output draining >300 ml/day.MRCP showed cystic duct stump leak.Date for ERCP was fixed .ERCP sphincterotomy was done with placement of stent.Patient was discharged on 12th postoperative day.

All three patients were closely followed up and found in satisfactory condition.It has been more than 18 months follow up and all three patients are doing well.

Table 1

PATIENT CHARACTERISTICS	CASE 1	CASE 2	CASE 3
AGE (In years)	27	30	23
SEX	F	F	F
DURATION OF SYMPTOMS (in months)	6	3	8
SERUM ALKALINE PHOSPHATASE (in IU)	54	90	88
USG ABDOMEN (a) Gall bladder status (b) Stones (c) Common bile duct staus	Well distended Multiple Normal	Well distended Multiple Normal	Well distended Multiple Normal
INTRAOPERATIVE FINDINGS (a) Adhesions (b) Identification of calot's triangle (c) Bleeding (d) Requirement of suction (e) Time taken	 None Clear Not significant No 35 mins	 None Clear Not significant No 38 mins	 None Clear Not significant No 40 mins
DAY OF SUTURE REMOVAL	7	8	8
POSTOPERATIVE DAY OF BILE LEAK PRESENTATION	11th	5th	12th
READMISSION	Twice	Same	Once
MANAGEMENT	USG guided percutaneous drainage followed by ERCP and stenting	USG guided percutaneous drainage	USG guided percutaneous drainage followed by ERCP and stenting
HOSPITAL STAY (in days)	21	11	12

DISCUSSION

All three cases were discussed in mortality morbidity meeting to find out the cause for bile leak in relatively easy cases note was made of use of overized clips to ligate cystic duct.

After observing these three patient unit protocol was made to ask the patient to purchase LT 300 clips and used where ever indicated .In 6 months time we did not have a single case of bile leak.

In our case series we thought about oversized clip as a cause of cystic duct stump leak because all three cases were young females with simple gallbladder without any comorbidity,clear anatomy was observed in all three cases,all three surgeries were performed by surgeons having over 10 years experience of laparoscopic surgery, suction was not used in either of case still these patients had eventful post operative period with increased suffering, need for readmission ,and prolonged hospital stay posing financial burden on patients .As ERCP facility is not available at our centre it further added to patients problem .

Here we are not talking about other causes of bile leak we are giving emphasis on preventable cause of bile leak like use of appropriate size of clip with proper technique for ligation of cystic duct to ensure nondislodgement in postoperative period . If appropriate size clips are not available then one should use suture to ligate cystic duct.Early investigation of bile leaks with ERCP allows prompt diagnosis of bile duct injury,facilitating early repair and increasing the chance of long term repair.(2)

The cystic duct is 2-4cm in length and 1-5 mm in diameter .Although visualitation of dilated cystic duct is possible with US,CT or cholescientigraphy,the normal calibre cystic duct may be difficult to detect with these techniques.(5)

The mechanism by which surgical clip migration takes place is unclear but is thought to be partly affected by technical factors such as incorrect placement and overcrowding of clips ,multiple clips may be dangerous .Appropriate angle while applying clips ,visualization of both the limbs of clip applicator and application of firm pressure and use of adequate size clips for adequate size of cystic duct .(6)

A study by Brooks et al reported 9 bile leaks among 650 patients who underwent LC,30 of these (0.46%) were caused by clip dysfunction .(7)

Use of absorbable PDS clip has been stated effective and applicable to majority of patients .In study by Leung KL et al there were no clip related problems .Out of 297 only in 45 patients Polydioxanone clips failed .(8)This also showed technique of clip application is more important after assessing size of cystic duct and selecting accurate size of clip for application .

Laparoscopic surgery must be performed expertly,slowly,carefully with appropriate ligature techniques and by a well trained surgeons or ,terrible consequences can occur .Being a surgeon we should keep in mind that every patient is different and their response to surgical procedure is also different.

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