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Subtotal laparoscopic cholecystectomy influences the rate of conversion in patients with difficult laparoscopic cholecystectomy: Case series

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HIGHLIGHTS

- Subtotal laparoscopic cholecystectomy (SLC) is the safest procedure of choice for difficult cases of the elderly and prolonged symptoms.
- Postoperative retained stones were statistically significant in subtotal laparoscopic cholecystectomy.
- The conversion rate of 5.5% was recorded.
- Subtotal laparoscopic cholecystectomy is feasible and safe for patients with obscure Calot's especially those with acute cholecystitis in meager resource settings.

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ABSTRACT

Objectives: This study aimed to show that subtotal laparoscopic cholecystectomy (SLC) is a safe procedure that reduces the rate of conversion in patients with difficult laporoscopic cholecystectomies in resource-meagre settings.

Patients and methods: Following informed consent, patients with gallstones reporting to Atbara Medical Centre, Atbara, Northern Sudan from February 2012 to July 2013 were managed laparoscopically except those with choledocholithiasis. SLC was done for patients with difficult cholecystectomy and obscured Callot's triangle. Clinical presentation, duration of symptoms, ultrasound findings, frequency of conversion to open operation, frequency of difficult cholecystectomy, operation duration and numbers/types of complications were recorded. Statistical analysis was carried out using SPSS.

Results: One hundred and nine patients with a median age of 48 years, F:M ratio of 9 and mean duration of symptoms of 14.8 ± 12.9 months were enrolled. A quarter (29/109, 26.6%) had acute choleycystitis, 13% had difficult laparoscopic cholecystectomy. SLC was done for 16.2%. Retained stones were statistically significant in patients who underwent subtotal laparoscopic cholecystectomy ($p = 0.02$) with a conversion rate of 5.5%.

Conclusion: SLC is feasible, safe and can reduce the rate of conversion for patients with difficult laporoscopic cholecystectomy. Sub-total laparoscopic cholecystectomy is not a substitute to conversion and in difficult conditions it is not a failure for the surgeon but a wisdom.

1. Introduction

Laparoscopic cholecystectomy remains the gold standard procedure in treating patients with gallstone disease [1]. Observation of every step in the procedure with application of standard measures is mandatory. Adequate skills and learning curve considerations should be undertaken to reduce the risk of complications [2].

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Laparoscopy encourages more patients who are expecting cosmoses and early return to work to undergo surgery. Recently, there was a trend to operate in the initial admission of acute phase of cholecystitis [3,4]. Laparoscopic cholecystectomy indications have increased substantially to include: patients with liver cirrhosis, old patients and patients with absolute contraindication to open surgery [5]. Difficult cholecystectomy could be anticipated pre-operatively in elderly patients, patients with long duration of symptoms, male patients, concomitant diseases like portal hypertension, ultrasound findings and history of choledocholithiasis. This makes subtotal laparoscopic cholecystectomy (SLC) a safe alternative with added advantages of avoiding common bile duct injury and liver bed bleeding [6–8]. SLC is indicated in patients with obscure anatomy in Calot's triangle, dilated cystic duct, very short cystic duct and in patients with Merizi syndrome. However, complications of SLC include biliary leakage in a minority and retained common bile duct stones [9,10]. Four different variants of SLC have emerged since its introduction as a new technique in 1993 [11]. SLC differs from a conventional cholecystectomy in the location of the trans-section at the gallbladder neck or Hartmann's pouch with the remnant gallbladder pouch left behind. The first method basically involves excising most of the gallbladder's anterior wall, leaving part of the posterior wall attached to the liver and the remainder of the gallbladder stump left open (method A). Method B is similar to method A except that the gallbladder stump is closed. The third method (method C) differs from methods A and B, because it includes resection of both the anterior and posterior gallbladder walls. In method C the pouch is closed and drains are not used routinely compared to other methods. Method D resembles method C except that the pouch is left open with a drain is put close to it [11,12]. The conversion to open surgery is part of laparoscopic cholecystectomy to insure maximum patient safety. Conversion rate is usually between 5 and 7%, decreasing in many centres with accumulating experience in laparoscopic surgery. The main cause of conversion is obscure anatomy that is usually seen in more than half (55.3%) of procedures, followed by adhesion in 26%, bleeding in 8%, suspicion of choledocholithiasis in 4.3% and failure of progression in 5.3%. Conversion rate has never been affected by te timing of surgery in acute cholecystitis [13]. SLC has been introduced recently in Atbara, a provincial town in Northern Sudan. This study aims to test safety, feasibility of SLC in resource-meagre settings (see Fig. 1).

2. Patients and methods

This prospective, case series was registered at Research Registry [ResearchRegistry.com, UIN Walid1518]. Following informed consent, consecutive patients who were diagnosed with cholecystitis and referred to Atbara Medical Centre, Nile State Ministry of Health from February 2012 to July 2013. Patients with choledocholithiasis were not enrolled, but referred for management by ERCP first. Demographic, clinical and follow up data was recorded in hospital record sheets. Patients with acute cholecystitis were operated on at initial admission regardless of the time of presentation even those with palpable gallbladder, except when there were absolute contraindications like pancreatitis or obstructive jaundice. At anaesthesia induction, ceforuxime l.5 g and Ondansetron were used. Heparin was reserved for patients with risks of thrombo-embolic disease [obese, history previous DVT and prolonged preoperative admission]. The first 11 mm trans-umblical port was placed via open technique through an umbilical incision to create pneumoperitonium. The other three ports were placed under direct vision. An 11 mm port at the epigastrium and two 5.5-mm ports: one placed at the mid-clavicular line, approximately two finger breadths below the costal margin and the other was placed at the mid-axillary line two finger breadths below the costal margin according to baseball diamond concept. The flow rate was kept at a minimum of around 1.5 L/minute. In difficult Laparoscopic Cholecystectomy a window was created between the liver and the gallbladder away from Calot's triangle then an intra-corporeal knot using silk suture was applied at a convenient site (neck of Hartmann's pouch to achieve subtotal laparoscopic cholecystecomy. The gall bladder anterior and posterior walls were successfully excised completely in many cases. The cystic artery was usually dissected and clipped, drains were used whenever indicated. The umbilical incision was closed using prolene # 2.

The results of this work has been reported in line with the PROCESS criteria [14].

3. Results

One hundred and nine patients were recruited with a mean age of 47.6 ± 13.59 years and male female ratio of 1:9. The mean duration of symptoms was 14.6 ± 13.59 months. About a quarter (27%, 29/109) had acute choleycystitis, 21% (23/109) were difficult laparoscopic cholecystectomies. SLC was performed in 16.2% (17/109) of cases.

Diabetes mellitus and gallbladder wall thickness were not statistically different in patients with difficult cholecystectomy compared to total laparoscopic choleycytectomy (TLC) cases ($p = 0.9$). In addition, difficult cholecystectomy (acute cholecystitis), prolonged symptoms were also not significantly different. Difficult laparoscopic cholecystectomy (DLC) associated variables like old age, sex, recurrent symptoms; previous abdominal surgeries were not significant (Table 1). The study patients were categorized depending on the procedure performed: the SLC group (16.2%, 17/109) and the TLC (78.9%, 86/109). About Forty per cent (7/17) of patients who underwent SLC, presented with acute cholecystitis. Retained stones were reported in 1 patient (1/17, 5.8%) 3 months after surgery in the SLC group and was managed by ERCP. This was significantly different from the TLC group ($P = 0.02$). Port hernia was seen in a minority of patients (1/17, 3%) in the same group, with no significant difference from the TLC group ($p = 0.2$). The mean duration of hospital stay was similar for SLC and TLC groups ($p = 0.07$) Table 2.

The conversion rate was 5.5%, while the time of conversion was in the first 10 min of operation for the 5 converted cases and 30 min in a patient with intra-hepatic course of gall bladder. Obscure anatomy was reported in 3.6% (4/109) of study patients. All converted surgeries ended up with subtotal cholecystectomy, except in one patient whose gall bladder was frozenly attached to liver. Her histology was negative for malignancy. This patient developed gallstone ileus 4 months later and was subjected to laparotomy. Patients' age was strongly correlated to conversion ($p = 0.013$), while male sex, gall bladder wall thickness; diabetes mellitus and duration of symptoms correlated poorly to conversion ($p = 0.38$, 0.07, 0.99) Table 3.

4. Discussion

Subtotal laparoscopic cholecystectomy is a safe alternative procedure to conversion in dealing with difficult laparoscopic cholecystectomies. Contra-indications for laparoscopy nowadays are similar to or almost the same as for open surgery, so more patients with relatively high risk of DC [portal hypertension, old patients and those for urgent surgery in acute cholecystitis] pose a challenge to laparoscopic surgeon. Nowadays, there is accumulating skills to deal with difficult laparoscopic cholecystectomy with results close to that of conversion. The most feared complication in laparoscopic cholecystectomy is common bile duct (CBD) injuries and their catastrophic sequels [15–19]. In SLC the