



USE OF THREAD IN LAPAROSCOPIC CHOLECYSTECTOMY- A STUDY OF FIVE YEAR EXPERIENCE

General Surgery

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ABSTRACT

Cholecystectomy is among the commonest operations in general surgical practice. Laparoscopic cholecystectomy is the gold standard for treatment of cholelithiasis. There are many techniques used for ligation of cystic duct in laparoscopic cholecystectomy at present with their advantages and disadvantages. In this study I used thread as a ligating material for cystic duct. The study was done in Tapaswi Hospital, Bhagalpur, Bihar with total number of patients in my study were 1500 from January 2012 to December 2016. Routine investigations were done before posting for operation. The study group included both males and females. The Results of the study showed that cystic duct ligation with thread is practical, safe and cost effective as compared to use of clips.

KEYWORDS:

Laparoscopic cholecystectomy, Thread, Cholelithiasis, Cystic duct

INTRODUCTION:

It all started back in 1882, when Carl Langebuch (1846-1901) of Germany performed the first cholecystectomy. In 1985 (103 years later), Prof Dr Erich Mühe of Germany performed the first laparoscopic cholecystectomy. He performed 94 such procedures before another surgeon, Phillippe Mouret of Lyon, France, performed his first laparoscopic cholecystectomy in 1987, followed by Francois Dubois of Paris, France, in 1988. In several instances, the literature gives the French credit for developing the laparoscopic cholecystectomy procedure. In the back old days, 3 most important, basic instruments used in the first laparoscopic cholecystectomy were the laparoscope, the hemoclip, and the pistol grip scissors. The laparoscope had been used by gynecologists for many years for diagnostic purposes before the general surgeon Mühe initiated laparoscopic cholecystectomy in 1985. The essential instruments used at that time were the hemoclip, namely the Weck-Reynolds pistol grip clip applicator and the Weck-Reynolds pistol grip scissors, which were important for the ligation and cutting of the cystic duct and artery during laparoscopic cholecystectomy. Walker Reynolds, Jr's interest in hemoclips began in 1970 when these devices were used for hemostasis of blood vessels in conjunction with staple surgery. In 1971, the first pistol grip applicator made by Edward Weck & Co., of Triangle Park, North Carolina, was used by a gynecologist named Gutierrez. He used it for tubal ligations. In 1972, a pistol grip hemoclip applicator was designed by Edward Weck & Co. for Reynolds who developed techniques using hemoclips to ligate ducts and blood vessels for open cholecystectomy and hemorrhoidal veins in hemorrhoidectomy. A pistol grip applicator was used rather than a ring applicator because visualization was better when applying hemoclips to blood vessels and ducts and provided firmer fixation. Edward Weck & Co. made other pistol grip applicators for Reynolds in different lengths and designs for other surgical procedures.

J. Barry McKernan and William B. Saye performed the first laparoscopic cholecystectomy in the United States on June 22, 1988 in Marietta, Georgia. In performing their very first laparoscopic cholecystectomy, Saye sutured the cystic duct and artery. Later they adopted the pistol grip applicator and scissors to ligate and clip between the cystic duct and artery. Other American surgeons who performed pioneering laparoscopic cholecystectomies in 1988 were Eddie J. Reddick and Douglas O. Olsen of Nashville, Tennessee. They also adopted the pistol grip hemoclip applicator and scissors to ligate and cut between the cystic duct and artery. These surgeons were the primary teachers of the laparoscopic cholecystectomy technique in the United States.

The incidence of minor post-operative bile leaks in the absence of bile duct injury varies between 0.4 and 0.6. One reason for the bile leak is laceration of the cystic duct by metal clips resulting in bile leakage from cystic duct. This is because of ability of the metal clips to conduct electricity causing a cut in cystic duct or causing necrosis of clamped tissue. Clips can also cause occlusion & stenosis of the common bile duct without causing any laceration. Rarely the metal clips can erode

into the cystic duct & migrate into common bile duct. Such migration of the clip into the common can act as nidus for stone in common bile duct. Such complications are rare with the use of thread in ligating cystic duct and artery.

MATERIALS AND METHODS

The study was done in Tapaswi Hospital, Bhagalpur, Bihar with total number of patients in my study were 1500 from January 2012 to December 2016. Routine investigations were done before posting for operation. The study group included both males and females. After taking written informed consent, detailed history and examination was done. Baseline investigations like complete blood counts, bleeding time, clotting time, renal function tests, liver function tests, serum electrolytes, Chest X-Ray, Electrocardiography were done. Ultrasonography of abdomen was done. General anesthesia was applied for all patients. The author used the 4-port technique consisted of 3 of 5 mm trocars for hand instruments and 1 of 10 mm trocar for telescope. All trocars were reusable including hand instruments. The surgeon on the left side of the patient and used two-hand technique. The first umbilical port was always punctured by direct vision (open technique). The intra-abdominal pressure was limited at 12 mm Hg by CO₂ insufflation directly through the trocar. The fundus of GB was pulled cephalad by the most lateral port. The infundibulum of GB was grasped and pulled laterally via the midclavicular port to expose Calot's triangle. The dissection at posterior peritoneum of Calot's triangle and then anterior peritoneum to create two windows was done. The first one was between cystic duct and cystic artery in the classical anatomy of the Calot's triangle. The other one was between cystic artery and right hepatic duct or inferior surface of liver. To knot cystic duct, the thread was introduced from epigastric port and the first loop needed 2 rounds. These first 2 round loop was less likely to loose and the next 2 loops needed just one round.

The cystic duct is ligated intracorporeally in a surgeon's knot configuration. The ends of the thread are cut with an Endo-Scissors. The distal end of the cystic duct, near to the Hartman's pouch, is occluded by the ligature in a similar way with a remaining thread and the duct is cut in between the two ties. The second tie is important to prevent spillage of gallbladder contents, and at the same time to leave the left hand instrument free thus facilitating dissection of gallbladder from liver bed. The cystic duct is cut between the two ligatures and cholecystectomy is completed in the usual manner. The cystic artery was cauterised near the base of liver and gallbladder.

RESULTS

Laparoscopic cholecystectomy was done in 1455 patients and rest 45 patients were converted into open cholecystectomy. The study included 1250 females and 350 male patients. The mean age was 35 years (20-75). The average weight was 55 kgs. Of 1500 patients the average operation time was 55 minutes (25-160). The average number of knots was 5 in each patient. Some patients needed just 3 knots for both cystic duct. Negative suction drain was kept in 300 patients.

Focus was done on no drain technique. There were 25 patients with questionable filling defect at distal CBD and laparoscopic exploration of CBD was proceeded. T-tube was inserted in CBD laparoscopically. Bleeding occurred from GB bed of macronodular liver surface, dissection both adhesion and thick wall GB. The study found 42 patients with minor complications which mostly did not affect hospital stay. There were 30 patients with intra-operative bleeding but all cases were controlled. Fever on the second postoperative day occurred in 56 patients without obvious causes. No Intra-abdominal collection (bile leakage) took place. 5 patients got post-operative nosocomial infection. This patient was fully recovered by the conservative treatment. 58 patients were lost to follow-up. The average follow-up time was 12 months. The post-operative bleeding was nil in this technique. Analgesia was prescribed for all of the patients. It was a simple analgesic (diclofenac). Pain was scored on a visual analogue scale from 0 to 10, in the immediate postoperative period and 24 hours later. 10 patients had infection at port site which was managed later. Hence it was shown from the results that thread has better advantages than using other methods of ligating the cystic duct.

DISCUSSION:

Laparoscopic surgery is a well established alternative to open surgery across all disciplines. Although positive magnitude of impact varies by the procedure, generally the benefits of laparoscopic surgery on post-operative pain, cosmetics, hospital stay and convalescence are recognised widely. Many surgeons have attempted to use alternatives to non absorbable clips such as absorbable clips, locking clips, absorbable knots or more recently ultrasonic dissectors for cystic duct occlusion. So far, many studies are available which favour use of knots over clips in terms of safety, feasibility and cost effectiveness.

Simple metal clips have been used by most surgeons to close the cystic duct since Muhe reported the first successful Laparoscopic cholecystectomy in 1985. However, the use of simple metal clips has many disadvantages. Postoperative cystic duct leaks occur in up to 2% of cases. Cystic duct leak is a potentially serious complication causing biloma formation or biliary peritonitis. Cystic duct leak- age can occur for the following variety of reasons: in- adequate closure of the duct due to mismatch of the clip arms, necrosis of the duct at the site of clipping, or slip- page of the clips off the end of the duct. Furthermore, in the process of application, the metallic clips can fall from the applicator. There are other disadvantages to using metal clips. There is a significant inflammatory reaction to metallic clips, and there are artifacts in subsequent computed tomography (CT) or magnetic resonance imaging (MRI) scans. Metal- lic clips also can migrate. Cetta et al. reported that clip migration occurred in 18 of 71 patients over the course of 1 year. Clips migrated from their initial site to either the peritoneal cavity or the common bile duct, serving as a potential nidus for gallstone formation. Locking absorbable clips were used instead of simple clips to close the cystic duct, but these clips are expensive. Recently, Harmonic Scalpel was proposed as an alternative technique for cystic duct closure. However, it is also expensive and not readily available and therefore used infrequently.

CONCLUSIONS:

This study showed that cystic duct ligation with thread is practical, safe and cost effective as compared to use of clips.

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