Performing Laparoscopic Cholecystectomy using Diagnostic Laparoscope : Our Adaptations

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Introduction

Cholecystectomy is among the commonest operations in general surgical practice. With the advent of laparoscopy and NOTES, minimal access surgery has justly replaced conventional surgery as procedure of choice for most surgeries [1], especially cholecystectomy. Although laparoscopy has well been incorporated in post graduate surgical training, surgical laparoscopy sets are not available in all field/rural hospitals. This leads to unnecessary referrals to higher centre, which not only adversely affects the image of the local hospital, but also overloads the apex hospitals with routine surgeries. The silver lining is availability of basic gynecology laparoscopy set (one 10 mm - 0 degree telescope, two 10 mm ports, one 5 mm port, 1 Maryland, 1 non toothed grasper) in most hospitals for diagnostic laparoscopy and sterilization. This article describes the technical modifications made in successful use of this set in performing laparoscopic cholecystectomy.

Technique

With the patient under general/ spinal anaesthesia, closed capnoperitoneum is created using Veress needle to reach an intra abdominal pressure of 8-12mm Hg. Ten mm supraumbilical and subxiphoid ports are placed for camera and right hand working instruments, respectively. Left hand working instrument (non-toothed grasper) may be placed with / without a port through a 5mm stab incision. In the absence of port and toothed grasper, for holding / pushing the fundus of gallbladder, a stab incision is made subcostally at a point closest to the fundus, which is made out by indenting the anterior abdominal wall under laparoscopic vision. Robert's forceps is introduced through the stab incision (Fig. 1) and the fundus is grasped with it and pushed towards

the rt shoulder (Fig. 2). Care must be taken to keep the stab incision <5 mm in size, lest air escapes out. Adhesions are cleared off gallbladder and cystic duct/ artery are dissected in Calot's triangle. In the absence of laparoscopic cautery, regular cautery is used, wherein the foot-switch control remains with the operating surgeon and the metallic tip of the cautery lead is kept constantly in touch with the metallic knob provided for cautery attachment in the laparoscopic instruments (Fig. 3). Absence of clip applicator is made good with intra corporeal suturing/ knotting, using free silk sutures (Fig. 4). Robert's forceps is shifted from fundus to the Hartmann's pouch while ligating the cystic duct/ artery to provide adequate exposure of Calot's triangle, by traction, and for relieving the working instruments for knotting. Gallbladder is dissected off its bed using Maryland, with use of cautery as described before. Gallbladder is extracted by placing it first on the liver, next to the sub-xiphoid port; sub-xiphoid port is then withdrawn and Robert's forceps is introduced through the opening (Fig. 5) with which the gallbladder is grasped and extracted (Fig. 6). In the absence of laparoscopic suction, suction is performed by pulling in a tracheal suction tube through the subcostal orifice, after removing the Robert's forceps. Outer end of tracheal suction tube is kept pinched whilst its tip is directed at places where suction is required. Straightening the kink achieves suction, as the positive pressure in the abdomen is sufficient to push the unwanted fluid out. Irrigation is done by instilling saline through the same catheter or through the air vent in the ports.

Special situations

Redundant gallbladder: In cases of redundant gallbladder, the gallbladder is grasped further proximally, almost near the Hartmann's pouch, using the Robert's

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Fig. 1 : Insertion of Robert's forceps through a stab incision for holding the fundus of gallbladder.

Fig. 2 : Laparoscopic view showing the fundus being held by the Robert's forceps.

Fig. 3 : Use of conventional cautery for laparoscopic surgery.

Fig. 4 : Use of free silk sutures for ligating the cystic duct.

Fig. 5 : Robert's forceps being introduced through the subxiphoid port for extracting the gallbladder.

Fig. 6 : Gallbladder being extracted using Robert's forceps.

Fig. 7 : Position of the Robert's forceps near the Hartmann's pouch in cases of redundant gallbladder and during ligation of duct/ artery.

forceps (Fig. 7). This maneuver gives adequate traction for displaying the Calot's triangle adequately for intracorporeal suturing/ knotting.

Tense inflamed gallbladder/ mucocoele/ pyocoele: The gallbladder is first decompressed by sucking out the bile/mucopus using a needle, introduced percutaneously.

Short cystic duct/ artery: We found it wiser to tie the proximal end alone and cut the cystic duct near the gallbladder [2]. Bile spill may then be sucked out. The distal end of the artery merely needs to be cauterized. Spilt stones need to be retrieved by placing them painstakingly in a condom.

Shortcomings

These include bile/ stone spillage (6.1%); increased operative time (30-45 minutes instead of 15-20 minutes); increased conversion rate (4.4% instead of 2.1%) [3].

Our experience

Forty nine consecutive cases (45 females : 4 males in the age range of 20 years to 70 years; median age 40) were operated upon using the described technique between Jul to Sept 2008. Of the 49 cases 15 were difficult gallbladders (4 thick walled tense mucocoeles, 3 pyocoeles, five cases with dense adhesions on a thick contracted gallbladder and three cases with adhesions

at the Calot's triangle and a very short cystic duct). Of all cases, 2 (4.4%) were converted to open cholecystectomy due to dense adhesions and contracted thimble gallbladder. Bile/ stone spillage from the gallbladder took place while extracting the gallbladder in 3 (6.1%) cases. The spilt bile could be sucked out and the stones could be retrieved, with ease, using a condom as an endobag. No other adverse effects were observed. A median of 35 minutes was needed for performing the surgery. The post-operative pain was in the range of 15-40 (median 25) by Verbal Response Score which could well be managed using Non-steroidal Anti Inflammatory Drugs. The pain was generalized all over the abdomen in the initial 6 hours and shifted to port sites alone by the first post-operative day [4]. All, but two patients could be started on oral fluid diet by the evening of surgery (after 6 hours) and could be put up for discharge the next day. Two patients had post operative nausea and vomiting necessitating delay in commencing oral nutrition till the first post operative day.

Taking notice of our work, money was sanctioned with which cautery lead, hook, scissors and toothed grasper could be procured. Armed with better equipment, over 270 laparoscopic surgeries have been performed from Jul 2008, including 190 laparoscopic cholecystectomies (using more or less the same technique described above), 24 laparoscopic

herniotomies, 4 ureterolithotomies, 8 bilateral laparoscopic gonadal vein ligation, 30 laparoscopic appendectomies (2 port technique); 12 diagnostic laparoscopies and 1 laparoscopic PAIR, deroofing and omentoplasty.

In conclusion, using the described modifications, gynecology/ diagnostic laparoscope can well be utilized for performing common surgical operations such as cholecystectomy, in field/ rural settings, by surgeons reasonably experienced in laparoscopy.

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Conflicts of Interest

None identified

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Journal Scan

Helgeson MD, Potter BK, Burns TC, Hayda RA, Gajewski DA. Risk factors for and results of late or delayed amputation following combat-related extremity injuries. *Orthopedics* 2010; 33: 10.

The authors studied patients with combat-related injuries that required delayed amputation at least four months after the initial injury due to dysfunction, persistent pain, and patient desires. Late amputations were performed 22 times in 22 patients (21 men, 1 woman) since 2003. Fourteen patients underwent transtibial amputation, five transfemoral amputations, one knee disarticulation, and two transradial amputations. The primary indications for late amputation were neurologic dysfunction in six patients, persistent or recurrent infection in six, neurogenic pain in three, non-neurogenic pain in five, and a globally poor functional result in two. Sixteen of 22 patients reported multiple indications for electing to undergo amputation, with an average of 2.1 specific indications per patient. At final clinical follow-up an average of 13 months after amputation,

all patients reported subjectively improved function and reported that they would undergo amputation again under similar circumstances. When medically and functionally practicable, every effort is given to limb salvage following severe combat-related extremity injuries. There is no single risk factor that increases the likelihood of delayed amputation, but the combination of complex pain symptoms with neurologic dysfunction appears to increase the risk, particularly if the initial insult is a severe hindfoot injury or distal tibia fracture. The authors concluded that with appropriately selected and counseled patients, elective late amputation results in a high degree of patient satisfaction and subjectively improved function.

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