International Research Journal of Natural and Applied Sciences
Vol. 3, Issue 8, August 2016 IF- 3.827 ISSN: (2349-4077)
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DAY CARE LAPAROSCOPIC CHOLECYSTECTOMY - EVALUATION OF INFLUENCING FACTORS

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ABSTRACT

BACKGROUND: Laparoscopic cholecystectomy (LC) is the most common minimal invasive surgery being performed the world over. However, its acceptance as day care surgery is still limited because of certain unsolved factors. The purpose of this study was to evaluate these influencing factors.

METHODS: 140 patients equally divided into two groups-A and B, underwent LC as per predefined protocol-senior surgeon achieving critical view of safety under low pressure (LP) pneumoperitoneum (10 mm Hg) versus junior surgeon performing conventional procedure under standard pressure. They were assessed for vitals, pain and nausea/vomiting in the recovery room. Those fulfilling the discharge criteria were discharged at 7-8 pm. Any complication or readmission was noted.All were followed up.

RESULTS: Group A-Operating time was 30 to 65 minutes.All cases were done under LP except four, out of which two had post operative pain. No procedure required conversion to open method. Drain was kept overnight in two. Five had nausea/vomiting. Seven required overnight observation and sixty-three were discharged at 7-8 pm. There was no complication. None required readmission.

Group B-Operating time was 50 to 90 minutes. Procedure was converted to open in three patients. Ten had post operative pain, eight had nausea/vomiting and seven had both. These required observation and rest forty-five were discharged at 7-8 pm.Two required readmission with bile duct injuries.

CONCLUSION: Overall surgical experience, achieving critical view of safety and LP pneumoperitoneum seem to influence day care LC.

KEYWORDS: Surgeon's experience; Day care laparoscopic cholecystectomy; Critical view of safety; Standard/low pressure pneumoperitoneum

INTRODUCTION

Laparoscopic cholecystectomy(LC) has received a universal acceptance and is considered the "gold standard" method for treatment of cholelithiasis because of its advantages over conventional cholecystectomy[(1)]. It is the commonest operation among all laparoscopic procedures being performed in Northern part of India. Taking its advantages further, some authors have tested its feasibility to be taken as "Day Care" surgery in uncomplicated cholelithiasis. However, the incidence of unnoticed bile duct complications , bleeding , post operative pain, nausea and vomiting remained the key factors halting its acceptance worldwide[(2)]. In the last two decades, improvement in surgical skill, understanding of vasculoductal arrangement of hepatobiliary system, advancement of anesthesia and other strategies have reduced the incidence of these factors to some extent, making it possible as day care surgery. To settle these concerns, there are two options, either the surgeon keeps the patient overnight and wellbeing of the patient testifies itself of these concerns, so as to be discharged on the next morning or the surgeon takes appropriate measures to address these above said risk factors to discharge the patient safely and confidently. First by adopting a well accepted and best technique of performing LC which certainly ensures safety from vasculoductal injuries and at the same time taking appropriate measures to minimize post operative pain, nausea and vomiting. Having performed more than 12000 patients of laparoscopic cholecystectomy personally in a single center since 1992 and gone through the literature from time to time in last 2 decades, the author thought that achieving critical view of safety (CVS), as advocated by Strasberg et al, seems relevant to almost get rid of vasculoductal injuries, which in turn will alleviate the fear of surgeon in discharging the patient on the same day. Though many surgeons don't practice this

operative step as a routine but it has shown its advantage in safeguarding against bile duct injury.[3] As far as post operative pain is concerned, different authors have suggested various strategies to avoid or minimize it and performing laparoscopic cholecystectomy under low pressure pneumoperitoneum (10 mmHg) has been observed to be an effective solution.[4] With these ideas in our mind, we decided to put together practice of achieving complete CVS by meticulous dissection under low pressure pneumoperitoneum to evaluate whether they contribute significantly towards the same day discharge. For this, we undertook a comparative study of 140 patients, 70 in each group to compare LC as day care surgery by one surgeon achieving complete CVS keeping low pressure pneumoperitoneum vs another consultant performing conventional LC under standard pressure (14 mm Hg). To the best of our knowledge, this is probably the first report of day care laparoscopic cholecystectomy (DCLC) undertaken evaluating the relevance of these factors together.

MATERIAL AND METHODS

All the patients were examined and investigated pre operatively followed by pre anesthesia check up. Admission protocol was managed by surgery head office team. One senior resident and administrator in department of surgery coordinated with both the groups – A and B and divided patients by picking up slips for both teams. The patients did not know that which team they have been allotted into and what protocol will be followed.

Group A protocol– The procedure involved mandatory achievement of complete (all 3 components) CVS under low pressure(10 mmHg) pneumoperitoneum.

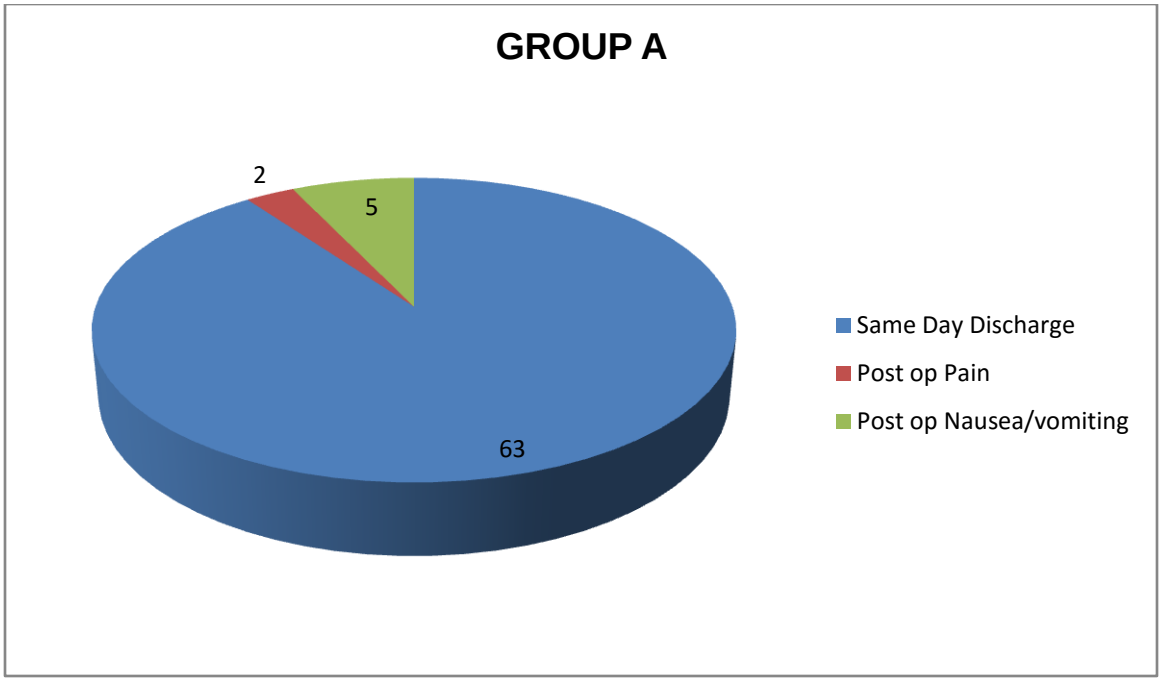
Group B protocol- Conventional Cholecystectomy was performed under standard pressure pneumoperitoneum.

Patients were counseled by the surgery resident assisting the surgery and advised overnight fasting before the surgery. They were instructed to reach the surgery ward by 7AM to be prepared for surgery by 8AM. Operation was scheduled as first case of the operating list. General anaesthesia was given using standard protocol. Pneumoperitoneum was created by Veress needle technique. Operation was performed by both teams as per the protocol. Local injection of ropivacaine was instilled at the liver bed and bupivacaine infiltrated at port sites in both the groups. Patient was extubated and shifted to recovery room when fully conscious and cooperative and was assessed for vitals and pain (using Visual Analogue Scale), nausea,

vomiting there itself by the surgeon. Patient was allowed to take sips of water 6-8 hours small quantity of clear liquids 2 hourly after surgery as they had been given adequate intravenous fluids for the day. Patients who had stable vitals, accepting liquids orally, able to walk without support, passed urine, did not have drain output, were discharged at 7-8 pm after giving them detailed instructions by the resident. They were instructed to report to the concerned surgery resident at 8 am on the next morning about their well being or at any point of time if they have even the slightest doubt about patient's well being. Patients were followed up in surgery OPD on 3rd, 7th and 10th post operative day.

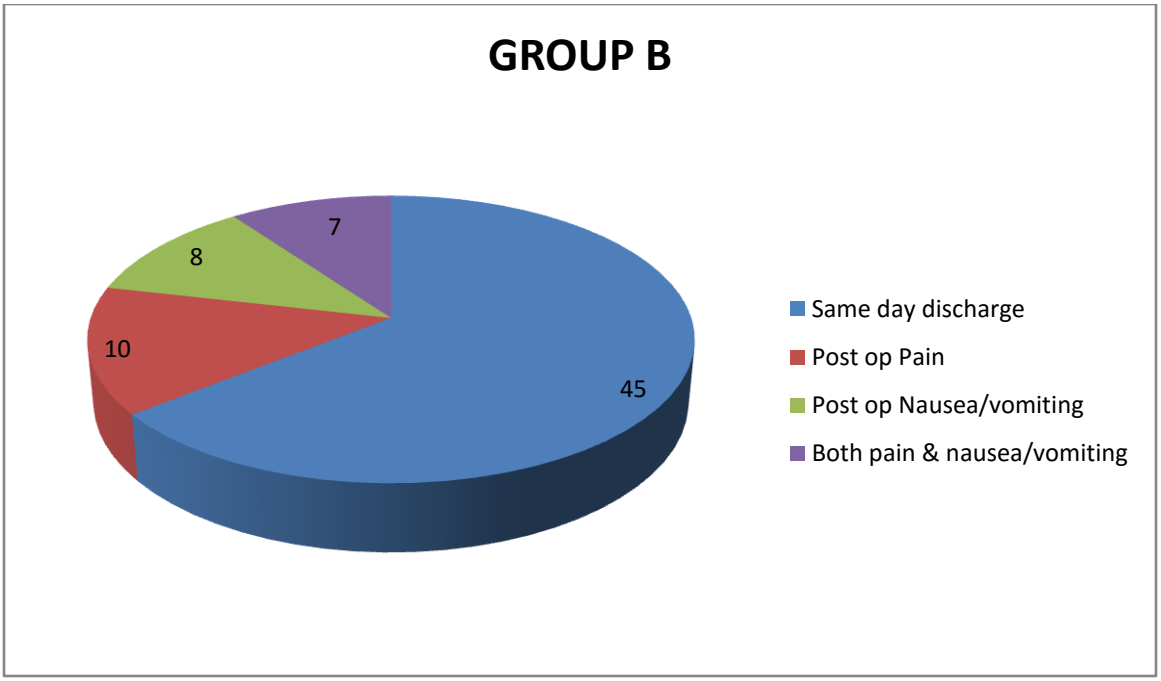
RESULTS

Group A - Time taken for surgery ranged from 30 to 65 minutes. All cases were done under low pressure pneumoperitoneum except four in which pressure had to be increased to 14 mm Hg. Out of these, two patients complained of post operative pain requiring intravenous analgesics. No procedure required conversion to open method. In 2 patients drain was kept overnight after noticing 80-100 ml serosanguinous blood tinged fluid in one and bile mixed fluid in the other. 5 patients, including 2 in which drain had to be kept, had post operative nausea and vomiting requiring 1 or 2 doses of intravenous antiemetics. All these 7 patients were kept overnight under observation and 63 patients were discharged at 7-8 pm in the evening. All those kept overnight were comfortable by next morning rounds and so were discharged. There was no complication in any patient. During follow up in surgery OPD, all patients were satisfied. No patient was readmitted.



Graph 1: Results of Group A

Group B – Time taken for surgery ranged from 50 to 90 minutes. In 3 patients, procedure required conversion to open method, 2 because of profuse bleeding during dissection and 1 because of unexpected adhesions due to which structures could not be identified. 10 patients complained of post operative pain requiring intravenous analgesics, 8 complained of post operative nausea/vomiting requiring intravenous antiemetics and 7 complained of both. These patients were kept under observation and rest 45 patients were discharged on the same day. Out of those kept under observation, 16 were discharged on the next morning when they were comfortable and 9 were discharged at 48 hours. 2 patients required readmission on the 4th post operative day. On investigation, ultrasound showed formation of Bilioma. On MRCP, both had bile duct injuries, major in one, involving the right hepatic duct and minor in the other, involving the subvesical duct.



Graph 2: Results of Group B

DISCUSSION

The concept of DCLC gained acceptance after having known the overall benefits of this procedure.[5] Recent systematic reviews and meta analysis have shown the feasibility, safety and acceptance of this procedure in selected patients, which reduces cost and achieves high level of patient satisfaction.[6] However, this procedure as a day care surgery could not gain acceptance worldwide because of unnoticed complications[7] and persistent post operative pain, nausea and vomiting. Our results also show similar concerns i.e. unnoticed operative complications detected postoperatively on readmission as well as the high incidence of post operative pain, nausea, vomiting were seen in group B, whereas completely opposite results were noticed in group A. In group B, the complications of ductal injuries leading to readmission seem to be related to surgeon's experience. On reviewing the recorded video of these procedures in a joint discussion meeting of the department, it is evident that the right hepatic duct was misidentified, giving a false impression of a cystic duct to the surgeon who was not aware of this being cut. This is a classical example of misidentification where it gives a false impression of a funnel being formed from gall bladder to cystic duct. Here, it would be worth mentioning that this misidentification usually happens in cases of inflammation where the right hepatic duct gets fused or stuck up to the neck of the gall bladder giving a false impression of being cystic duct only. But in this case, neither there was any inflammation nor was there a difficult dissection. So, here the human

factor could have played a role in misidentification with an already fixed mindset of the surgeon which is termed as cognitive fixation ("This and nothing else"). This probably happened the way it has been explained that when a surgeon believes that he or she has operated on the correct structure, then there is no trigger for seeking a second opinion. He or she continues to believe whatever has been in his or her mind about a particular structure. But on reviewing the video recording, another person can easily make out that there is a ductal structure seen coming from the back and entering into the hilum. This testifies that surgeon is the key factor in many ways- whether it is patient selection, judgment, knowledge, skill or overcoming human factors. Although occasional observation has been opposite to this belief that complications do occur in experienced hands, but generally there has been a consensus on getting better outcome with more surgical experience. Group A results substantiate this fact that if the dissection had been taken to the level of achieving complete CVS, this injury would not have occurred. This highlights the drawback of infundibular technique, which though works well in day to day surgeries but occasionally brings the surgeon into an error trap.[8,9] Achieving CVS serves two purposes – firstly, it makes you dissect out and demonstrate all vascular and ductal structures and secondly, it is one of the best methods of ductal identification which prevents bile duct injuries.

Our study has shown that operating time also gets reduced in experienced hands thereby reducing anesthesia time and anesthetic agents required, as well as CO2 used for pneumoperitoneum. This also contributes to some extent in discharging the patient on the same day. Post operative pain, nausea and vomiting after laparoscopic cholecystectomy have been important limiting factors for ambulatory surgery. The etiology of post laparoscopic pain can be classified into three aspects: visceral, incision, shoulder[10] and various drug regimes and methods have been proposed to prevent or reduce them. Results of our study approve of the observation by many authors with experience of low pressure pneumoperitoneum. We observed that in group A, there was a significant reduction in post operative pain, whereas in group B, in spite of taking all other measures except low pressure, significant number of patients had pain. This shows that pneumoperitoneum does affect the incidence of post operative pain, especially shoulder tip pain. In addition, by lowering the pressure, benefits of minimal invasive surgery could be extended to include many more patients with compromised cardiorespiratory status, which otherwise would be contraindicated with a standard pressure.[11] But at the same time, if the surgeon finds it technically difficult to carry out dissection in low pressure, there should be no hesitation in increasing the pressure to 14 mm Hg[10]. We also had 4 patients who required the

pressure to be increased to standard pressure and 2 of them experienced post operative shoulder tip pain requiring intravenous analgesia. We can thereby conclude that low pressure pneumoperitoneum helps in reducing the incidence of post operative pain, thereby paving way for same day discharge of the patient. Keeping a drain after LC has been an optional approach by surgeons since its inception[12] and we also used it in group A by cutting it short so as not to irritate the diaphragmatic area and removed it by the evening rounds. We feel that it serves the purpose of draining the wash fluid and the residual CO2 and at the same time giving information of unnoticed vasculoductal and any other injuries. We had 2 patients in group A in which drain had to be kept overnight after noticing 80-100 ml serosanguinous blood tinged fluid in one and bile mixed fluid in the other. They were observed overnight in anticipation of any untoward complication. Both patients were thoroughly discussed in the morning rounds and discharged satisfactorily after getting ultrasonography. On reviewing videos of these patients, we found out that bile spillage was due to gall bladder perforation. But even then, we kept the patient for observation. At this juncture, it is worth mentioning that in another study by Marinis et al[13], one patient who had to be readmitted with post operative bleeding with hypovolemic shock and had to undergo re-laparoscopy, would have benefitted with the placement of intra abdominal drain. We feel and suggest that keeping a drain for at least 6-8 hours does not do any harm. It might not have contributed much in same day discharge but the information provided by it kept us vigilant about the patient. Though the patients included in our study were a selective group but the results encouraged us to extend the benefits of DCLC to at least ASA class III patients and those with acute cholecystitis presenting within 48 hours, provided the procedure is done as per the protocol followed in group A.

CONCLUSION

In conclusion our study shows that overall surgical experience, which in itself is interlinked with achieving critical view of safety and low pressure pneumoperitoneum, seem to be the relevant factors in day care laparoscopic cholecystectomy.