**ABSTRACT**

**Aim:** The aim of this paper is to study the outcome of day case laparoscopic cholecystectomy (DCLC) in children. **Materials and Methods:** A clinical pathway for day care laparoscopic cholecystectomy was followed with emphasis on the analgesia, post-operative nausea and vomiting (PONV), feeding, mobilization, pain scoring and patient satisfaction. Demographic and clinical data were recorded prospectively from March 2013 to November 2013. The setup allowed easy access to an overnight stay if needed. Hospital stay, complications, the need for medical advice after discharge, convalescence and patients satisfaction were analyzed. **Results:** We admitted 11 children with symptomatic cholelithiasis for day case laparoscopic surgery. There were no intra- or post-operative complications. The incidence of PONV was 0/11. There was no readmission. 4/11 patients complained of shoulder tip pain on follow-up next day. There was no overnight stay. **Conclusions:** Adoption of a DCLC pathway is feasible and safe for children. Emphasis on adequate pain management and avoidance of PONV results in a high rate of day case surgery equivalent to that achieved in adult practice.

**KEY WORDS:** Cholecystectomy, day case, laparoscopy

**INTRODUCTION**

Gall bladder disorders are uncommon in children. The role of laparoscopic cholecystectomy (LC) as first line treatment for symptomatic choledolithiasis is well-established. The procedure is usually performed leaving the child overnight in the hospital. Day case laparoscopic cholecystectomy (DCLC) in adult has been in practice since 1990s and there is an abundance of reports promoting its use. DCLC is now listed on the British Association of day surgery. In India recently a day care surgery association has been formed.

The primary consideration however should remain patient safety. A recent meta-analysis of five randomized controlled trials in adults demonstrated that compared with overnight stay, DCLC is safe and effective in selected patients and is likely to save costs. The role of DCLC in pediatric practice is established, but not very popular. There has been only two report on DCLC in children and only one of them outlines clear practice guideline and care pathway in children, which forms the basis of our study.

**MATERIALS AND METHODS**

Our study was based on the DCLC practice guideline outlined by Jawaheer et al., but slightly modified according to our hospital practice [Figure 1]. We included the patients with symptomatic gallstones having the following criteria:

1. Patient less than 18 years without major comorbid conditions
2. Living within 20 km of the hospital
3. Had access to a telephone at all times
4. Were living with a responsible adult and were capable of reaching the hospital on their own
5. Were thought to be able to understand instructions (this necessarily included the post-surgery primary care giver).

All patients were seen in the outpatient clinic before DCLC and informed consent was obtained. Blood tests and an abdominal ultrasound scan were requested. Patients were all admitted electively on the morning of the procedure and underwent a LC.

All patients were induced by consultant anesthetist with propofol and muscle relaxation with atracurium. An orogastric tube was inserted after endotracheal intubation and maintenance with oxygen, nitrous oxide and desflurane. Antiemetic prophylaxis with dexamethasone and ondansetron was given. All patients had bilateral classical transversus abdominis plane (TAP) and bilateral subcostal TAP block with 0.125% bupivacaine – 20 ml at each site, under ultrasound guidance [Figures 2 and 3].

A standard four-port technique was used with a 0° 10 mm port at the umbilicus and three 5 mm secondary ports. Carbon dioxide (CO₂) insufflation pressures were kept at or below 12 mm Hg and a low insufflation rate of 1-3 L/min was used. At the end of the procedure, an effort was made to evacuate as much CO₂ from the peritoneal cavity as possible. Drains were not used in any patient even if they had a bile leak while separating the gall bladder from its bed. In the post-operative period, early mobilization was encouraged as well as enteral intake of fluid and light diet. Pain was assessed by the child’s nurse and scored using the Wong and Baker FACES pain rating scale. All patients were seen in the evening by the surgical and the nursing team and a decision was made regarding discharge. It was considered important to leave the final decision regarding discharge from hospital to be made jointly by the patients’ families and the nursing team.

Criteria for discharge were normal temperature, pulse and blood pressure, tolerance of fluid and light diet, adequate pain control, comfortable mobilization and patient/carer satisfaction with discharge. The following day, they were called to the outpatient department for review.

All day case LC performed between March 2013 and November 2013 were analyzed and data regarding...
operative details, outcomes and intra- and post-operative complications were recorded prospectively.

The introduction of the clinical care pathway was in line with that as mentioned by Jawaheer et al. and modified as per our hospital practice.

RESULTS

Clinical outcomes are reviewed in 11 patients who were admitted between March 2013 and November 2013. Out of 14 children admitted for LC during the above period only 11 children (4 male and 7 female) met the criteria to undergo DCLC. Three children were excluded from the study due to insurance asking for more than 24 h admission in two patients and wish of the parents for overnight stay in one patient.

Median age was 11.8 years ranging from 10 to 15 years. Recurrent abdominal pain was the common presentation and indication for surgery. Two boys had morbid obesity but there was no other co-morbid condition. Blood results including liver function tests were normal in all patients at the time of surgery. None of the patients had associated hematological conditions. Ultrasonography was done in all patients to confirm the diagnosis of cholelithiasis before admission. Median operating time was 57 (range 45-70) min.

There were no intra- or post-operative minor or major complications and there were no conversions to open procedure. There was no intra-operative bleeding which required a blood transfusion. Patients were discharged on the day of surgery median pain score was 3/10 (range 0-4) on the day of discharge and 2/10 (range 0-3) on the day after the procedure. Four patients complained of right shoulder tip pain on the following morning. Difference in medical charges between patients discharged on the same day and between those who stayed overnight was approximately Rs. 20,000.

DISCUSSION

Day care surgery is possibly the clearest and most evident example of economy in any health care system. [7] Though day care surgery in children is well-established for various other conditions, there was little published experience of day care surgery for LC. There has been only two report on DCLC in children and only one of them outlines clear practice guideline and care pathway in children, which forms the basis of our study.[5,6] During laparoscopic procedure, several factors are associated with the need to admit patients for observation. These consist of pain management, post-operative nausea and vomiting (PONV). Pre- and intra-operative pain and vomiting management are crucial in patients undergoing outpatient and in-patient surgery. Although reduced post-operative pain is one of the biggest advantage of laparoscopy, pain is not always completely relieved. Sources of pain during laparoscopy are port wound, stretching of the peritoneum causing phrenic nerve neuropraxia during insufflations and residual intra-abdominal CO₂. [6] We recommend the use of TAP block and bilateral subcostal TAP block with 0.125% bupivacaine ~ 20 ml at each site, under ultrasound guidance for pain relief. 4 of our patients complained of right shoulder tip pain due to phrenic nerve stretching. To avoid this, child’s abdomen should be insufflated slowly with low pressures of 8-10 mm Hg and flow at 1 L/min. Finally, all residual CO₂ should be removed from the peritoneal cavity once the procedure is finished to reduce the peritoneal irritation caused by the intra-abdominal acidosis. [7] Nausea and vomiting were well-controlled by intra-operative dexamethasone and ondansetron.

The most significant lessons to be learnt by the study were that admission on the day before the procedure was unnecessary, that explanation of the procedure and discharge policy to the families in the outpatient setting was extremely important in shaping their expectations and influencing their acceptance of having a major procedure performed in an ambulatory setting. The role of the nursing team in achieving one’s goals should not be underestimated. The post-operative nursing management of children having DCLC requires a major shift away from a traditional conservative approach with regard to introduction of enteral feeds, mobilization and pain management.

We attribute the main success of DCLC to the use of intraperitoneal local anesthetic in this series, given the recent randomized sham controlled trial demonstrating benefit from intraperitoneal techniques. [9]

It is thus concluded that DCLC in children is feasible in the majority of patients requiring cholecystectomy as a sole procedure and can be performed with excellent results without compromising patient safety. A multidisciplinary team approach and the adoption of a clinical care pathway focusing on adequate pain management and avoidance of PONV are a prerequisite for success. Reduced hospital stay and medical charges are significant advantage in performing LC as outpatient procedures for selected children. [5]

REFERENCES


