Role of laparoscopic cholecystectomy in children

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ABSTRACT

The present study is undertaken to establish the usefulness of laparoscopic cholecystectomy and to know its merits and demerits as compared to open cholecystectomy in children. In all, 28 patients who underwent cholecystectomy (8 open and 20 laparoscopic cholecystectomy) in B.Y.L. Nair hospital between July 1999 and March 2004 were analyzed. Calculous cholecystitis was found to be the most common indication for surgery. Operative time for laparoscopic cholecystectomy was more than that in open cholecystectomy in the early phase of laparoscopy, which got reduced as we gained experience. The requirement of parenteral antibiotics and analgesics and the duration of stay were significantly shorter with laparoscopy. The advantages for a child in laparoscopic cholecystectomy as compared to open cholecystectomy are minimal pain, avoidance of an upper abdominal incision, cosmesis and shorter duration of hospitalization with quick return to home and school. Thus, laparoscopic cholecystectomy is safe and efficacious in children.

KEY WORDS: Cholecystitis, laparoscopic cholecystectomy, open cholecystectomy

MATERIALS AND METHODS

All patients, who underwent cholecystectomy in Nair Hospital, Mumbai, between July 1999 and March 2004, were reviewed. Between July 1999 and December 2000, nine patients underwent open cholecystectomy. From December 2000 till March 2004, 21 patients underwent laparoscopic cholecystectomy. The medical records of all these children were analyzed. Data were abstracted pertaining to clinical history, diagnosis, operative technique, postoperative complications, and length of stay in the hospital. Of the laparoscopic group, one patient in addition underwent open splenectomy along with laparoscopic cholecystectomy and was excluded from the final analysis. One patient in the open group, who had combined open cholecystectomy and splenectomy, was also excluded. Thus, 28 patients were included for the final analysis. Laparoscopic cholecystectomy was done with minor technical modifications with respect to the patient’s age.

RESULTS

In all, 28 patients who underwent cholecystectomy were finally analyzed (8 open and 20 laparoscopic cholecystectomies). Of the 20 laparoscopic cholecystectomy group, four patients were less than 5 years, 10 patients between 5 and 10 years and six patients between 10 and 12 years. The youngest patient in the study was a 2.5-year-old boy. Twelve patients were males and eight were females. In eight patients who belonged to the open group, two patients were less than 5 years, five patients between 5 and 10 years and one between 10 and 12 years. Five patients were males and three were females. Symp-
tomatic gallstones were present in 25 patients. Acute cholecystitis was the indication for cholecystectomy in only three patients. None of the patients had jaundice. On hematological workup, it was found that four patients had hereditary spherocytosis and one had sickle cell anemia. Two of the patients had, in addition, hypersplenism in whom open splenectomy was done along with laparoscopic cholecystectomy in one case and in the other combined open cholecystectomy and splenectomy was done. All patients underwent elective cholecystectomy once the acute episode had subsided.

Technique of laparoscopic cholecystectomy
We routinely use four ports with the open technique for port insertion. They are 10 mm epigastric and three 5 mm ports. Port site was selected depending on age and weight of child because of disparity in working space and length of instruments. For pneumoperitoneum, we use CO₂ at a flow rate of 1 l/min and a pressure of 8-10 mm of Hg. We use medium-size clips for cystic artery and cystic duct. None of the patients underwent peroperative cholangiogram. Routinely we do not use a drain postoperatively.

In two cases, we encountered bleeding from the cystic artery, which we were not able to control laparoscopically and therefore converted to open. This was in the early part of the learning curve. In one case, there was complete transection of the common bile duct (CBD), which was fortunately detected during surgery. In this case, the gall bladder was sessile and the Hartmann’s pouch was lying on the CBD. CBD was mistaken to be the cystic duct and was transected. We immediately converted and performed Roux-en-Y hepatico jejunostomy. On the first postoperative day, the patient had profuse bile discharge through the drain and hence re-explored and redo of anastomosis done as the anastomosis had given way partially. Later patient had an uneventful recovery. As shown in Table 1, the operative time varied from 45 to 180 min with a mean time of 75 min. In the early phase, the operative time was more and as we gained experience the operative time reduced. Only five patients needed I/M Diclofenac during the first postoperative period and none of the patients required parenteral analgesic later, except in cases where conversion was done or an additional open surgery was done. All patients were given three doses of parenteral cephalosporin, aminoglycoside and metronidazole (one dose preoperatively and two postoperatively). Of the 20 patients, 16 were discharged on the second postoperative day and one patient on the fourth postoperative day. The two patients who were converted were discharged on the eighth day. One patient who had CBD injury was discharged on the 15th postoperative day. Of the 20 patients, 16 returned to their normal activity, i.e., going to school and play within 8 days. Patients who were converted (three cases) took at least 3 weeks to return to normal activity [Table 1].

In the open cholecystectomy group of eight patients, all had gallstones that were symptomatic. All patients underwent standard open cholecystectomy through a subcostal incision. The operating time varied from 35 to 90 min with a mean time of 50 min. Parenteral antibiotics were given for 5 days and parenteral analgesic for 3 days. Of the eight patients, six were discharged on the eighth postoperative day and two on the tenth postoperative day. Wound infection was seen in one patient. All patients resumed normal activity only after 3 weeks.

DISCUSSION

This study examined our last 28 consecutive cases of cholecystectomies, 20 laparoscopic and eight open, to assess their relative effects on clinical, surgical, and economic factors. Nonhemolytic cholelithiasis was the most common cause for cholecystectomy (23 nonhemolytic (82.14%) and five hemolytic (17.86%)) in our study. Even other studies show nonhemolytic cholelithiasis as the most common indication for Cholecystectomy.[5] The mean operating time in the present study for laparoscopic cholecystectomy was 75 min and for open cholecystectomy 50 min (P-value is 0.0427). This shows that operating time for laparoscopic cholecystectomy is significantly more than that in open cholecystectomy, which was also seen in other studies.[5,6] However, this was seen in the earlier part of the learning curve and as experience was gained the difference in operating time became insignificant as has been seen in our study. In the laparoscopic group, patients needed only three doses of parenteral antibiotic as compared to 15 doses in the open group. Parenteral analgesic requirement in the laparoscopic group was just for a day, while it was at least

<table>
<thead>
<tr>
<th>Variable</th>
<th>OC (n = 8)</th>
<th>LC (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parenteral antibiotics</td>
<td>15 doses</td>
<td>3 doses</td>
</tr>
<tr>
<td>Duration of operation</td>
<td>50 min (mean)</td>
<td></td>
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<tr>
<td>2001</td>
<td>100-180 min</td>
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<tr>
<td>2002</td>
<td>70-110 min</td>
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<td>2003</td>
<td>45-100 min</td>
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<tr>
<td>2004</td>
<td>45-60 min</td>
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<tr>
<td>Parenteral analgesic (days)</td>
<td>&gt;3 days</td>
<td>Only for 1 day in 6 out of 20 cases</td>
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<tr>
<td></td>
<td></td>
<td>patients did not require parenteral</td>
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<td></td>
<td></td>
<td>analgesia</td>
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<tr>
<td>Duration of hospitalization</td>
<td>8-10 days</td>
<td>16(80%) in 2 days</td>
</tr>
</tbody>
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OC, Open Cholecystectomy; LC, Laparoscopic Cholecystectomy

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three days in the open group. Similar analgesic requirement was seen in other studies. The duration of stay of 16 (80%) patients in the laparoscopic group was just 2 days as compared to 8-10 days in all cases of the open group ($P$-value is 0.0002). In the laparoscopic group, 17 out of 20 (85%) patients resumed within 8 days but in the open group none of the patients resumed normal activity within 3 weeks (Table 2). Although the initial investment is significantly high, the ultimate overall cost per laparoscopic cholecystectomy was significantly less than for open cholecystectomy. We did not encounter any of the complications of trocar insertion and insufflation.

The advantages for a child in Laparoscopic Cholecystectomy as compared to open cholecystectomy are minimal pain, avoidance of an upper abdominal incision, cosmesis and shorter duration of hospitalization with quick return to home and school, which are of considerable importance from both a psychological point of view for the child and parents well as for the child’s physical well being. Therefore, laparoscopic cholecystectomy is safe and efficacious in children, and it compares favorably with traditional open cholecystectomy in the pediatric age group.

REFERENCES