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Laparoscopic Cholecystectomy in Paediatric Gall Stone Disease: Our Recent Experience

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Abstract

Aim: To assess the efficacy, safety and outcome of laparoscopic cholecystectomy (LC) in management of paediatric gall stone disease.

Methods: A retrospective analysis of children undergoing LC for cholelithiasis between January 2014 and December 2014 was done. The clinical profile, demographics, blood investigations, ultrasound (USG) results, on table findings and postoperative complications along with recovery and histopathological findings were analysed.

Results: During the study period of 12 months, 26 children (18 males and 8 females) with cholelithiasis underwent LC. Of these, 20 had presented with history of recurrent pain suggestive of a biliary colic, 2 had recurrent biliary pancreatitis, 1 had hemolytic jaundice due to underlying thalasemia and 3 were asymptomatic.

The mean age was 9.1 years (range- youngest 8months to eldest 15 years).

There were no intra or postoperative complications noted. The average duration of hospital stay was 2.5 days (range 2–4). And average duration of follow up was 7 months post operatively.

Conclusion: LC is an effective and safe surgical treatment for pediatric gall stone disease.

Keywords: Laparoscopic cholecystectomy; Paediatric Cholelithiasis

Introduction

Cholelithiasis is known to exert considerable disease burden globally but mainly in adult population. Though known to be far less common in children, its incidence and impact seems to be rising over last few decades. (1–3).Reports state an overall prevalence of 1.9% (4)

The accepted current method for treatment of gallstone disease in adults is laparoscopic cholecystectomy. However, substantial volume of reports of same in paediatric population seems to be lacking.

Numerous benefits of laparoscopic method over conventional open technique are known, a few of which are 1.earlier return of bowel function 2.less post operative pain 3. short hospital stay 4.improved cosmesis and 5.earlier return to full activity.

This distinguishes the laparoscopic approach clearly as a desirable method.

While a successful laparoscopic procedure is beneficial to the patient in many ways, a great amount of care needs to be practiced to avoid serious injuries on table that could lead to complication like major bile duct injury and associated morbidity.

This study aims to understand the safety and efficacy of such a procedure in paediatric population. We hereby present our data on patient demography, various indications for operations, intra operative events and post operative outcome.

Materials and methods

A retrospective analysis following institutional approval was done at Christian Medical College and Hospital, Vellore South India from 1st January 2014 till 31st December 2014. A total of 26 patients were recruited. Relevant medical records were reviewed and data analysed. The study included patients belonging to the age groups 15 and below who had undergone LC for various indications namely:

1. Biliary colic
2. Recurrent biliary pancreatitis
3. Incidental diagnosis
4. Known hemolytic disease

Preoperatively patients were investigated with hemoglobin, blood group type, liver function tests and an abdominal ultrasound.

All the patients were given a single dose of prophylactic antibiotic intravenously and all the procedures were performed under general anesthesia. Standard 4 port technique was used in all. The pneumo-insufflation was achieved using Veress needle in 2 patients and in the rest using Hasson's open technique. The intra operative events were recorded including the operative findings, intra operative complications and difficulties. All the patients were observed for immediate and delayed complications. The outcome was evaluated in terms of patient demography, intra operative events, conversion rates, complications and morbidity. This was interpreted in light of relevance of such a procedure in paediatric population.

The results were analyzed using Microsoft Excel.

Results

Out of 26 cases, 8 were females and 18 were males.

The mean age was 9.1 years (range- youngest 8 months to eldest 15 years).

Of these, 20 had presented with history of recurrent pain suggestive of a biliary colic, 2 had recurrent biliary pancreatitis, 1 had hemolytic jaundice due to underlying thalasemia and 3 were asymptomatic.

Of 20 patients who had biliary colic, 3 had positive murphy's sign on palpation but this did not seem to have any significance on radiological assessment or on table.

USG reports suggested either solitary or multiple gall stones in all except 2 children where it failed to show a definite stone.

Both these patients had presented earlier with recurrent biliary pancreatitis. Probably the stones had already migrated from the gall bladder down the biliary tract in these 2 children resulting in gall stone pancreatitis.

The size of the common duct was reported normal in all and confirmed on table. This obviated the need for routine on table cholangiogram supported by findings of normal liver function tests. One patient had presented with jaundice and deranged liver function tests and had a background hemolytic disease due to thalessemia. Since common bile duct size was normal in this patient too, on table cholangiogram could be avoided.

There was no event of intra or post operative complications noted. None of the patients required conversion. All the patients had an uneventful recovery and a mean hospital stay of 2.5 days (range 2–4).

There was no incidence of mortality or post operative morbidity.

Histopathological analysis of cholecystectomy specimens revealed chronic cholecystitis in 25 patients and no specific lesion in 1. The average duration of follow up was 7 months post operatively.

Discussion

Laparoscopic cholecystectomy has earned significant popularity since its advent in the modern surgery. Its advantages over the open system has established itself as a gold standard for cholelithiasis.(4) Even though debates continue on the complication rates and existence of a steep learning curve, it still remains the procedure of choice for gall stone disease(5). Though this has been proven beyond doubt in adult population, not many studies have been done in children.

Gall stone disease, in pediatric population, used to be considered rare until last few decades. The rise in its overall incidence could be possibly due to increasing use and availability of abdominal USG in children. Although regarded earlier as a disease of prematurity, and mostly related to parenteral nutrition, with time various risk factors have been identified. These include hemolytic disorders, obesity, family history of gallstones, abdominal surgery, cystic fibrosis and ceftriaxone therapy.(3) Yet the incidence of idiopathic cholelithiasis seems to be greater.

In one series, the incidence of idiopathic cholelithiasis was reported to be upto 52.5%.(3,6) In our study we found the incidence of hemolytic cholelithiasis as 3.8% while rest all belonged to the idiopathic category.

Multifactorial etiology could probably explain this phenomenon like dietary, endocrine and metabolic influence, dehydration, liver dysfunction and probably genetic mechanisms.(3)

Similarly it is said that almost 80% of adults with gallstone are incidentally diagnosed. (3,7). While in a study the incidence of incidental cholelithiasis was reported to be 10-33% amongst the paediatric population.(3) In our study we report an incidence of 11.5%. To keep a note, 2 of our patients had presented with recurrent biliary pancreatitis too.

The male to female gender ratio that we obtained in our study was 2.25 showing a clear dominance towards males.

In our experience, the technical aspects of doing LC in a child varies considerably from techniques that apply to the adult subjects. Firstly the instruments are shorter and secondly the intraperitoneal space created by pneumoinsufflation is restricted and does not allow that degree of freedom of movement as compared to adults. Besides the shape of abdomen being more squarish rather than rectangle as one would expect with adult abdomen, the port site creation especially becomes challenging and demanding.

The principles of triangulation of ports so that instruments can focus towards the organ of interest without creating sword effect becomes very important strategically in pediatric LC.

Calot's anatomy is better delineated in children comparatively due to lesser fat accumulation that makes dissection easier.

In our centre we prefer electrodissection and coagulation of the cystic artery following its correct identification. We use 3 hemolock plastic clips for ligating the cystic duct, 1 distally towards the gall bladder and 2 prox imally. The gall bladder is separated off the undersurface of liver using diathermy.

As evident in our study, we do not routinely perform on table cholangiogram unless indicated. This is in keeping with low incidence of subclinical common bile duct stones in children. (8)

The gall bladder is routinely sent for histopathological analysis. In our study, all but 1 of these specimens were reported to have chronic inflammation .

Therefore, in view of long life expectancy in children, the possibility of unforeseen complications of gall stone disease cannot be ignored. In our study we had 2 patients who had recurrent biliary pancreatitis. Besides, the histopathological analysis of the gall bladders also suggested chronic inflammation though sub clinical.

In view of these points, it seems prudent to offer an early elective LC to these children once diagnosed to have cholelithiasis whether incidental or symptomatic, in order to avoid complication rather than the policy of waitful watching.

Conclusion

LC is a safe, effective and commendable surgical treatment for pediatric gall stone disease.

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