Early Laparoscopic Management of Appendicular Mass in Children: A Changing Trend to Replace Interval Appendectomy

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ABSTRACT

Background*: There are numerous reports and studies to date advocating early laparoscopic intervention for complicated acute appendicitis with recommendation for laparoscopy even in cases complicated by gangrene or peritonitis. However, there are few studies concerned with laparoscopic management of appendicular mass formation. This study was conducted to examine the safety and efficacy of early laparoscopic intervention in pediatric patients with appendicular masses.* ***Methods:*** *We retrospectively studied appendicular masses treated laparoscopically at the pediatric surgical department of Cairo University Specialized Pediatric Hospital, in 2 years interval. Intraoperative course and postoperative outcomes were evaluated.* ***Results:*** *Twenty-three patients underwent laparoscopic appendectomy (3 ports). The mean operative time was 52 minutes with no intraoperative complications encountered. Hospital stay ranged from 5 to 7 days (mean 5.5 days). Three patients had minor complications, one suffered from supra-pubic port site infection and the other two patients suffered from postoperative collection.* ***Conclusion:*** *Our results suggest that laparoscopic appendectomy is a valid and safe option in children with appendicular masses.*

Key words: *Appendicular masses - laparoscopic appendectomy*

INTRODUCTION

Acute appendicitis is the commonest abdominal pediatric surgical emergency. Patients may present with vague and unspecific symptoms leading to delayed diagnosis in many cases [1, 2]. As a result of this delay the patient may present with gangrene, peritonitis or abdominal mass detected either clinically or by imaging [3]. There are numerous reports and studies to date advocating early laparoscopic intervention for complicated acute appendicitis with recommendations for laparoscopy even in complicated cases by gangrene or peritonitis [4, 5]. However, there are few studies concerned with laparoscopic management of appendicular mass formation. The usual management was initially conservative followed by "interval" appendectomy afterwards; which meant a higher morbidity and longer hospital stay, the need of second admission and high failure rate (10-20%) [6, 7]. As a result, early surgical intervention has evolved as a safe and effective alternative [8]. This study was conducted to examine the safety and efficacy of early laparoscopic intervention in pediatric patients with appendicular masses.

PATIENTS AND METHODS

During the period from January 2016 and December 2017, 23 patients presented to our hospital with appendicular masses were enrolled in this study. Patients characteristics were collected and included age, gender, presenting symptoms, and other medical problems. Investigations done included complete blood count, serum electrolytes, urine analysis, plain X-ray abdomen supine position and pelvi-abdominal ultrasound. The diagnosis of appendicular mass was confirmed on ultrasound. Computed tomography was performed in selected cases of abdominal pain with obscure diagnosis see figure (1). After induction of anaesthesia and intravenous antibiotics administration (Metronidazole and Cefurexime), all patients underwent laparoscopic appendectomy through 3 ports technique. With the patient in Trendlenberg position and right side up a 5 mm trocher supra-umbilical for camera is inserted using open (Hasson) method, also used for appendix extraction via endo-bag, another 5 mm working port in left iliac fossa and a 5 mm working port in supra-pubic region. Appendectomy is performed as regular, see figure (3), then the abdomen is

inspected for any evidence of pus which is irrigated by copious amount of normal saline.

Post operatively, close observation of the patients was done and included monitoring of the vital signs, persistent pain or fever or vomiting that may indicate post-operative complications like intraperitoneal collection or faecal fistula

The patients were kept on intravenous fluids and antibiotics till the return of intestinal motility, and then oral feeding can be started.

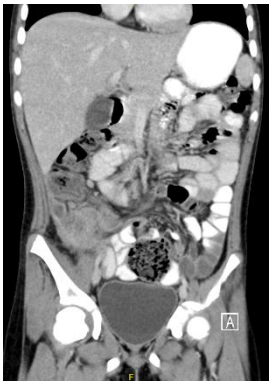

Fig. 1: CT finding of Appendicular mass

RESULTS

There was a slight female predominance (13 female and 10 males). The age of the patients ranged between 4 years and 12 years (mean 9.3 years). The diagnosis of appendicular mass was made clinically and confirmed by ultrasound or computed tomography. Patients presented 4 to 8 days after onset of symptoms (mean 5.8 days). All patients suffered from abdominal pain and fever, 8 of them suffered from persistent vomiting besides. The mean operative time was 52 minutes (range 40-73). None of the patients required conversion to open appendectomy. Oral intake was initiated 12 hours after surgery and was tolerated by all except one patient who suffered from 2 attacks of vomiting and required postponement of feeding for 24 hours. Patients continued 5 days of intravenous antibiotics and were put on acetaminophen IV thrice daily for 48 hours. Analgesic was converted to oral preparation given only on demand after 48 hours. Hospital stay ranged from 5 to 7 days (mean 5.5). Twenty patients had an uneventful postoperative course and suffered no complications. Three patients had minor complications, one suffered from supra-pubic port site infection. The other 2 patients suffered from postoperative collection. One of whom improved after ultrasound guided aspiration, while the other did not. Computed tomography showed missed intraabdominal fecolith in the patient with persistent symptoms (figure 2). The fecolith was retrieved through laparoscopy done 10 days after laparoscopic appendectomy.

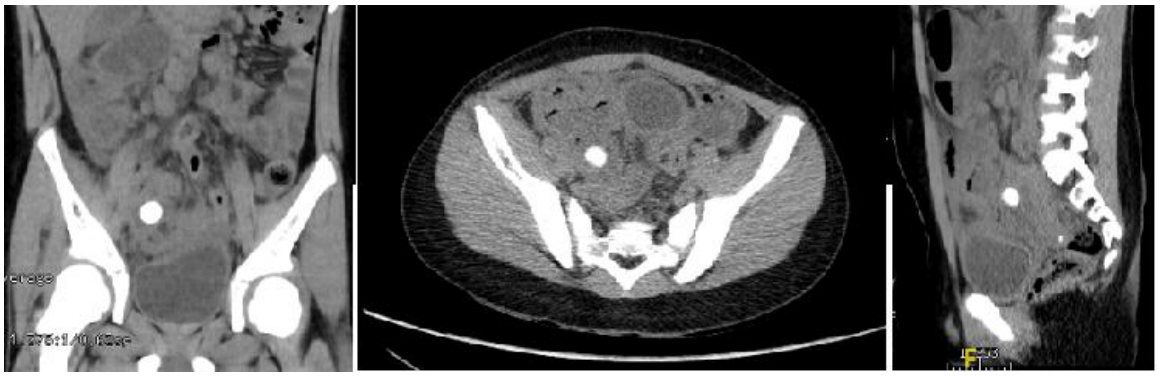

Fig. 2: CT finding of fecolith after laparoscopic appendectomy

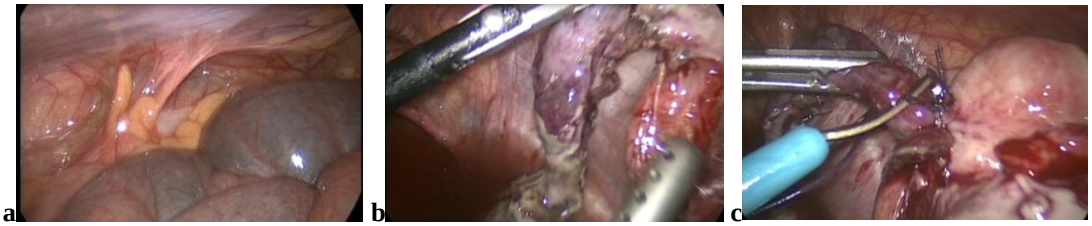

Fig. 3: Intra-operative findings laparoscopic appendectomy. (a) Appendicular mass seen after entering the abdominal cavity. (b) Appendix devascularized. (c) Appendix being cut by scissors.

DISCUSSION

The proper management of appendicular masses in children has been a subject of a heated debate. Some authors prefer early intervention as it allows exclusion of other causes of abdominal pain (e.g. Meckel's diverticulum, ovarian cyst or torsion) and obviate the patient another admission [9]. On the other hand, more traditional authors argue that most patients' symptoms will resolve spontaneously avoiding surgical intervention in a critically ill patient [10].

One of the disadvantages of appendectomy in cases of appendicular masses is the presence of multiple adhesions and severe inflammation that make identification and excision of the appendix very difficult with potential risk of damage to adjacent secondary inflamed structures such as the small intestine, cecum, the fallopian tubes and ovaries, and the ureter. Some authors also found a high infection rate following early intervention in complicated appendicitis whether open or laparoscopic, furthermore early series reported high rate of post-operative collection and foecal fistulae [4].

In our series of 23 patients with appendicular masses managed by laparoscopic appendectomy, the infection rate was much lower (only 4.3%) and 2 (8.6%) cases developed postoperative intraperitoneal collections that were treated either by percutaneous ultrasound guided aspiration or by laparoscopic reexploration. Although laparoscopic appendectomy in cases of appendicular masses is technically difficult, we did not need to convert to open surgery in any of our cases neither did we face any major complications.

Our results seem comparable with series of laparoscopic appendectomy in simple appendicitis and also the study done by Argwal and colleagues in 2016 about early laparoscopic management of appendicular masses in children [11,12]. The limitations of this study are the smaller sample size and complexity of these cases that requires a more experienced laparoscopic surgeon to avoid the abovementioned complications.

CONCLUSION

Despite this is not a large series, its results suggests that early laparoscopic appendectomy is a valid and safe option in children with appendicular masses.

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