Original Research Article

Stump appendicitis single centre experience: a retrospective study

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ABSTRACT

Background: Appendicectomy is the most common surgical procedure done for acute appendicitis worldwide. However, one among 50000 appendicectomy patients may present with recurrent abdominal pain, requiring hospitalization as stump appendicitis and may need completion appendicectomy. There are a few reports addressing management of stump appendicitis in the literature. Here we present our experience of laparoscopic completion appendicectomy over ten-year duration.

Methods: A retrospective evaluation of records of appendicectomy from January 2008 to December 2018. All patients who had stump appendicitis as diagnosis and those who underwent completion appendicectomy were included. There were no exclusions. Details pertaining to presentation, duration of symptoms, records of previous surgery, perioperative and postoperative data was recorded, including follow-up of at least six months.

Results: All 15 patients were managed by laparoscopic completion appendicectomy. Patients age range from 12 to 58 years, 12 were males and 3 female, duration of symptoms was from two to ten days, previous appendicectomy was done 4 to 84 months before, nine were diagnosed by ultrasonography of abdomen and six by CT scan, stump size ranged from 1 to 3.6 cm, mean operating time was 86.4 mins (range, 60-120 minutes). Duration of hospital stay was 3 to 5 days. There were no perioperative morbidity or mortality.

Conclusions: Laparoscopic approach of completion appendicectomy is safe for management of stump appendicitis.

Keywords: Stump, Appendicitis, Completion appendicectomy, Remnant appendix

INTRODUCTION

Stump appendicitis is defined as the inflammation of remnant appendix after incomplete appendicectomy.1 A common reason for incomplete appendicectomy is a failure to identify the base of the appendix. This residual appendiceal tissue remains as a potential region for inflammation and even can lead to complications like abscess formation, peritonitis, and intestinal obstruction. The diagnosis is usually delayed in view of prior history of appendicectomy, which contributes to increased morbidity. Stump appendicitis is rare and occurs in about 1 per 50000 cases.2 We offer to share our experience of this relatively uncommon disorder over a decade.

METHODS

This was a retrospective study of all patients who underwent completion appendicectomy from January 2008 to December 2018, performed at a tertiary care teaching hospital. All patients who had stump appendicitis as diagnosis and those who underwent completion appendicectomy were included. Details of patient’s presentation, duration of symptoms, records of previous surgery, investigations, imaging, type of
surgical procedure done, perioperative and postoperative complications, including follow-up of at least six months was collected from institutional registry. After proper preoperative preparation surgery was done.

In all cases pneumoperitoneum created with Veress needle at epigastrum, initially 5 mm optical port was placed at same site and diagnostic laparoscopy was done, 7mm optical port at the umbilicus and 5 mm working ports each at suprapubic region and right iliac fossa were placed, in some patients bilateral subcostal ports were placed for adhesiolysis before conventional ports. Adhesiolysis was done using a harmonic scalpel (Figure 1 and 2), pus collections were drained (Figure 3), the stump of the appendix identified (Figure 4), mesentery of stump divided with harmonic and completion appendicectomy done after ligating base of the appendix with two self-made 1-0 chromic endoloops (Figure 5), the specimen was taken out through umbilical port.

**Figure 1: Omental adhesiolysis.**

**Figure 2: Bowel adhesiolysis.**

**Figure 3: Pus collection being drained.**

**Figure 4: Identifying appendicular stump.**

**Figure 5: Stump ligation being done.**

**RESULTS**

Patient’s age ranges from 12 to 58 years, there were more males than females. All patients had undergone appendicectomy at other institutions before our review (Table 1).

**Table 1: Patients demographics.**

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>12-58 years</td>
</tr>
<tr>
<td>Sex</td>
<td>Males=12, Females=3</td>
</tr>
<tr>
<td>Appendicectomy</td>
<td>4-84 months before</td>
</tr>
<tr>
<td>Surgical approach</td>
<td>Laparoscopic=11, Open=4</td>
</tr>
</tbody>
</table>

**Statistical analysis**

The recorded data was compiled and entered in a spreadsheet (microsoft excel) and then exported to data editor of SPSS version 20.0. Continuous variables were expressed as mean ±SD and categorical variables were summarized as frequencies and percentages.
Table 2: Investigations.

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Findings</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total leucocyte count</td>
<td>5010-21500 cells/mm³</td>
<td></td>
</tr>
<tr>
<td>Ultrasonography</td>
<td>Thickened inflamed appendicular stump</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Appendicular stump not seen</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Collection in right iliac fossa and pelvis</td>
<td>7</td>
</tr>
<tr>
<td>CECT Abdomen and Pelvis</td>
<td>Inflamed and thickened appendicular stump</td>
<td>6</td>
</tr>
</tbody>
</table>

Patients presented to us with pain abdomen ranging from 2 to 10 days. Blood and radiological investigations (Table 2) were suggestive of stump appendicitis and its complications (Figure 6 and 7).

Figure 6: Axial view CECT abdomen showing inflamed appendicular stump.

Figure 7: Coronal view CECT abdomen showing inflamed appendicular stump.

All cases underwent laparoscopic completion appendicectomy. In seven patients drain was placed in pelvis. There were adhesions of omentum and small bowel to previous appendicectomy scar, pus collection in right iliac fossa and pelvis, stump size was significant and mean operating time was 86.4 minutes (range, 60-120 minutes) (Table 3). There were no perioperative morbidity or mortality. Drain was removed over an average of 2.5 days. Duration of hospital stay was 3 to 5 days. Histopathology revealed a different degree of inflammation in the stump, varying from submucosal inflammation to appendicitis with serositis. All patients were doing well at 1 and six months.

Table 3: Pre-operative findings.

<table>
<thead>
<tr>
<th>Findings</th>
<th>Number of patients/stump size in cms/operative time in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesions</td>
<td>5</td>
</tr>
<tr>
<td>Pus collection in right iliac fossa and pelvis</td>
<td>7</td>
</tr>
<tr>
<td>Stump size</td>
<td>1-3.6 cm</td>
</tr>
<tr>
<td>Mean operating time</td>
<td>86.4 minutes</td>
</tr>
</tbody>
</table>

DISCUSSION

Laparoscopic appendicectomy is the most common emergency procedure done for acute appendicitis, and most of such procedures have an uneventful postoperative period. Postoperative complications of appendicectomy may include wound infection, pelvic abscess, peritonitis, fecal fistulas and adhesive obstruction. However, if the appendicular stump is longer, it can get inflamed in future and result in what is known as stump appendicitis. Stump appendicitis is rare and occurs in about 1 per 50000 cases. It can be seen after both open and laparoscopic appendicectomy. The reasons for leaving a longer stump could be either anatomical (retro-cecal or subserosal appendix, or developmental like a duplicated appendix) or surgical (difficulty to find base due to severe local inflammation, difficult dissection or fear of bowel injury). There is a challenge in diagnosis once patient present with features of appendicitis, with the previous history of appendectomy, that results in delayed diagnosis and increased morbidity and mortality. One should have a high degree of suspicion in such cases, to get them diagnosed and operated at earliest.

Manoglu et al described a patient with cecal necrosis secondary to stump appendicitis who was referred to the hospital twice with complaints of abdominal pain. In our study patients were diagnosed and operated within 48 hours (5 patients was operated on the day of admission, 7 patients within 24 hours and 3 patient within 48 hours). In seven of our cases there were pus collections in right iliac fossa and pelvis, however no significant complications were encountered.

Kanona et al found that the time taken for stump appendicitis to develop in patients with inadequate appendicectomy ranged from 9 weeks to 50 years. Onder
et al, conducted two case studies and found that a history of appendectomy was four months back in one patient and four years in the other patient. In our research earliest time to develop stump appendicitis was four months, and the longest was seven years.

Symptoms and signs of stump appendicitis are same as that of acute appendicitis. It is radiological investigations that help us in reaching a diagnosis. USG can detect remnant appendix as a tube extending from the right iliac fossa or retro-cecal region. CT would reveal inflammation in the peri-cecal region, abscesses, thickening of the cecum or terminal ileum, and free-floating fluid at the peri-cecal or paracolic region. In our study, nine patients were diagnosed by USG and rest six by CT abdomen and findings were a varied length of the appendicular stump with inflammation along with iliac fossa and pelvic collections in some patients. There is no standardized surgical approach for stump appendicectomy; both open and laparoscopic methods can be done however the laparoscopic approach provides a better viewing angle. All our patients underwent laparoscopic completion appendicectomy with uneventful perioperative and postoperative period and were doing well on follow up.

CONCLUSION

Laparoscopic approach of completion appendicectomy is safe for management of stump appendicitis and can be done, however it needs surgical expertise.

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Ethical approval: Not required in view of retrospective study

REFERENCES
