Acute Appendicitis Following Appendectomy

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Keywords

Appendicitis · Stump appendicitis · Appendectomy

Summary

Background: Stump appendicitis is a rare delayed complication of appendectomy. Several diseases present with right lower abdominal pain, and therefore it is occasionally difficult to make a differential diagnosis, especially in patients with a history of appendectomy. In this paper we present our experiences with acute appendicitis following an appendectomy. **Patients and Method:** We selected five cases from January 2002 to December 2010. The clinical characteristics, imaging studies, treatment, and outcome were recorded. **Results:** All patients presented with abdominal pain (4 patients with fever). The mean duration of onset was 2 days. All patients had a history of ruptured appendicitis (2 patients showed a combination with generalized peritonitis). The mean duration since the previous appendectomy was 7.54 years. 4 patients underwent an abdominal ultrasound, and all patients underwent abdominal computed tomography, showing again a ruptured appendicitis. 4 of 5 patients had a stump appendicitis. All of the patients showed a good prognosis following surgery. **Conclusions:** The stump following an appendectomy should be shortened as much as possible. However, sometimes recurrent appendicitis with perforation will develop in patients with complete resection of the appendix. Stump appendicitis is associated with a history of ruptured appendicitis.

Schlüsselwörter

Appendizitis · Stumpfappendizitis · Appendektomie

Zusammenfassung

Hintergrund: Eine Stumpfappendizitis stellt eine seltene verzögerte Komplikation der Appendektomie dar. Mehrere Erkrankungen gehen mit Schmerzen im rechten unteren Bauchbereich einher und erschweren daher gelegentlich eine Differentialdiagnose, vor allem bei Patienten mit einer Appendektomievorgeschichte. In dieser Arbeit stellen wir unsere Erfahrungen bezüglich einer akuten Appendizitis nach Appendektomie vor. **Patienten und Methode:** Für den Zeitraum von Januar 2002 bis Dezember 2010 wurden fünf Fälle ausgewählt. Die klinischen Charakteristika, die Bildgebung, die Behandlung sowie das Outcome wurden aufgezeichnet. **Ergebnisse:** Alle Patienten wiesen Bauchschmerzen auf und 4 Patienten entwickelten Fieber. Die mittlere Dauer des Ausbruchs betrug 2 Tage. Alle Patienten hatten eine Appendixrupturvorgeschichte, während 2 Patienten eine Kombination mit generalisierter Peritonitis zeigten. Die durchschnittliche Dauer seit der letzten Appendektomie betrug 7,54 Jahre. Bei 4 Patienten wurde ein abdominaler Ultraschall durchgeführt, während alle Patienten eine abdominale Computertomographie erhielten, die erneut eine Appendixruptur aufzeigte. 4 von 5 Patienten hatten eine Stumpfappendizitis. Alle Patienten zeigten nach der Operation eine gute Prognose. **Schlussfolgerungen:** Der Stumpf aufgrund einer Appendektomie sollte so weit wie möglich gekürzt werden. Manchmal entwickelt sich jedoch eine rezidivierende Appendizitis mit Perforation bei Patienten mit kompletter Resektion des Appendix. Eine Stumpfappendizitis ist mit einer Appendixrupturvorgeschichte assoziiert.

Background

Appendicitis is a common acute surgical disease. It can be treated by McBurney's incision or the laparoscopic approach. The complications of appendectomy include wound infection, periappendicular or intraabdominal abscess, and postoperative adhesions [1]. Stump appendicitis is one of the delayed complications of appendectomy [2, 3].

Patients and Method

From January 2002 to December 2010, 5 adult patients (3 men and 2 women ranging from 34 to 73 years) with stump appendicitis were enrolled in this study. The diagnosis was made according to the operative findings. The clinical characteristics (age, gender, clinical presentation) as well as radiological (ultrasound, computed tomography (CT)), operative, and pathological findings were reviewed.

All patients initially visited the emergency room, and the laboratory data was checked. 4 patients underwent ultrasound, and all patients underwent abdominal CT.

Results

Clinical Characteristics

Among the 5 patients enrolled, the average age was 53 years (table 1). All patients presented with abdominal pain, and 4 patients were suffering from fever. The mean duration of onset was 2 days. All patients had a history of ruptured appendicitis (2 patients showed a combination with generalized peritonitis). The mean duration since the previous appendectomy was 7.54 years.

Imaging Findings

Four patients underwent abdominal ultrasound, with fluid accumulation being detected in all of these patients. Abdominal CT was performed in all patients. According to the findings of the abdominal CT, the stump of the appendix could be detected in 2 patients (case 1 and 5) (table 2).

Management and Outcome

All patients underwent a surgical intervention. Stump appendicitis could be detected in 4 patients. 3 patients underwent appendectomy, 1 patient underwent an exploratory laparotomy with a cecostomy tube, and 1 patient underwent a diagnostic la-

Table 1. Summary of clinical characteristics of 5 patients with stump appendicitis

Case	Age	Sex	Presentation	Duration of onset, days	History of appendicitis	Previous hospital stay, days	Incision	Duration of history, years
1	34	male	RLQ abdominal pain, fever	2	ruptured appendicitis	7	McBurney's	1
2	73	male	RLQ abdominal pain, sensation of fullness	3.5	ruptured and general peritonitis	21	midline	1.2
3	54	female	RLQ abdominal pain	2	ruptured appendicitis	5	McBurney's	12.5
4	59	female	RLQ abdominal pain	2	ruptured appendicitis	7	McBurney's	15
5	45	male	RLQ abdominal pain	0.5	ruptured and general peritonitis	11	midline	8

RLQ = Right lower quadrant.

Table 2. Summary of imaging findings, treatments, and outcomes in 5 patients with stump appendicitis

Case	Ultrasound	Computed tomography	Operative finding (perforation)	Operative finding (length of stump)	Treatment	Outcome
1	No examination	suspicious of swelling appendicitis with fluid accumulation	yes	1.5 cm	appendectomy	admission 7 days, discharged
2	Fluid accumulation	fluid accumulation in right side cecum	yes	no stump	exploratory laparotomy with cecostomy tube	admission 18 days, discharged
3	Fluid accumulation, distended bowel loop	minimal fluid accumulation, distended terminal ileum and ascending colon with fat stranding	yes	2 cm	diagnostic laparoscopy converted to segmental resection of terminal ileum and cecum	admission 14 days, discharged
4	Fluid accumulation, fecalith	swelling of cecum with fat stranding and a fecalith	yes	1 cm, including a fecalith	appendectomy	admission 5 days, discharged
5	Fluid accumulation	suspicious of swelling appendicitis with fluid accumulation	yes	2 cm	appendectomy	admission 6 days, discharged

Fig. 1. A patient without a stump (case no. 2). Fluid accumulation in paracecal region.

Fig. 2. A patient (case no. 3) with a stump in the base of the cecum.

Fig. 3. The pathology of a patient (case no. 3) showed acute suppuration in the base of the appendix (hematoxylin and eosin stain, $\times 40$).

paroscopy and converted to an exploratory laparotomy with segmental resection of the terminal ileum and cecum. All of the patients showed a good prognosis following surgery (table 2).

Discussion

Stump appendicitis is a rare complication of appendectomy. Less than 40 cases have been reported since 1945 [4–6]. The in-

cidence of stump appendicitis is not known. A long appendiceal stump is reported to be a risk factor for stump appendicitis. The length of the stump ranges from 0.5 to 6.5 cm [6–10]. In our study, most of the patients had a stump, although there was 1 patient without a stump (fig. 1). This patient had a history of ruptured appendicitis with peritonitis and underwent exploratory laparotomy with drainage of the abscess and appendectomy. During the operation, no stump appendix was found. However, the base of the cecum was inflamed with perforation (fig. 2), and there was a pocket of abscess in the base of the cecum (fig. 3). The patient recovered after drainage of the abscess and cecostomy. In our study, all patients had a history of ruptured appendicitis. This would suggest that ruptured appendicitis may be a risk factor of stump appendicitis.

Clark and Theodorou [11] reported that abdominal CT and laparoscopy are the most useful diagnostic investigations. In our study, abdominal CT was performed in all patients, and the diagnosis of acute appendicitis was determined preoperatively in most of the patients. Therefore, abdominal CT was also helpful in making the diagnosis in our study. Diagnostic laparoscopy was not performed in our patients. Occasionally, this may be difficult in patients who previously underwent surgery, especially in patients who received an exploratory laparotomy. Since most of these patients may have a history of ruptured appendicitis, abdominal CT may be the first choice in diagnosing stump appendicitis. However, diagnostic laparoscopy may be helpful in patients with an unclear diagnosis, especially if the CT scan does not provide a clarification of the situation.

In conclusion, stump appendicitis is difficult to diagnose. An abdominal CT and diagnostic laparoscopy are helpful in making a diagnosis, with an abdominal CT possibly being the first choice in this regard. The cause of stump appendicitis is mostly due to an incomplete removal. However, postappendectomy appendicitis can also be found in patients without a stump. Patients with a history of ruptured appendicitis may show an increased possibility of stump appendicitis, which may be caused by an unhealthy base of the appendix, unclear anatomy, or technical reasons such as incomplete removal.

Disclosure Statement

No conflicts of interests.

References

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