

## Stump Appendicitis – An Overlooked Clinical Entity

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### Rezumat

#### *Appendicita de bont – o entitate clinică neglijată*

Appendicita de bont este o boala rară, deseori neglijată ca entitate diagnostică. Posibilitatea unei apendicite de bont nu este clară tuturor medicilor. Poate reprezenta o dilemă diagnostică dacă indicele de suspiciune al medicului curant este mic. Simptomatologia este superpozabilă în totalitate peste simptomatologia apendicitei primare. Prezentăm două cazuri de apendicită de bont operate în clinica noastră. O cunoaștere în detaliu a acestei patologii poate duce la o tehnică chirurgicală inițială corectă și la prevenție, și la diagnosticul precoce în eventualitatea apariției complicației.

**Cuvinte cheie:** bont apendicular, apendicită acută de bont

### Abstract

Stump appendicitis is a rare disease, often overlooked. The possibility of stump appendicitis is not clear to all clinicians. It can represent a diagnostic dilemma if the treating physician is not aware of this uncommon disease. Presenting symptoms are indistinguishable from those of primary appendicitis. We present two cases of stump appendicitis operated in our department and their treatment. A heightened awareness of the possibility of this disease can lead to good initial surgical

technique and prevention, and to early diagnosis in the event of stump appendicitis.

**Key words:** appendiceal stump, stump appendicitis

### Introduction

Acute appendicitis is a frequent cause for surgery and should be considered in the differential diagnosis of nearly every patient with acute abdominal pain. On the other hand specific rare associations and instances concerning the appendix like stump appendicitis or Amyand and Garengeot hernias should be considered (1,2). Early diagnosis is the most important clinical goal in patients with suspected appendicitis and can be made primarily on the basis of history and physical exam in most cases. The three main causes are fecalith, lymphoid hyperplasia or tumor obstruction. Progressive distension of the lumen causes lymphatic and vascular obstruction leading to wall ischemia followed by bacterial invasion, inflammation and frank perforation if surgical treatment is delayed. Perforation at presentation ranges from 16% to 30% and is often seen at extreme ages and cases with atypical presentation. Delays in diagnosis significantly increase the chance of perforation (3). Treatment of acute appendicitis is appendectomy. Postoperative complications of appendicitis are wound infection, bleeding, intraabdominal abscess, small bowel obstruction and, rarely, stump appendicitis. Stump appendicitis is defined as the interval repeated inflammation of remaining residual appendiceal tissue after an appendectomy (4).

The possibility of stump appendicitis is not clear to all clinicians. It can represent a diagnostic dilemma if the

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treating physician is not aware of this uncommon disease. Stump appendicitis should be considered for the differential diagnosis of right lower quadrant pain. Delays in treatment can lead to morbidity and, eventually, mortality increase (5). Treatment of stump appendicitis is resection of the appendiceal stump.

The number of cases reported in the literature is not big. It revolves around 50 cases although there are some indications that the condition is underreported (6). We present two cases that show pathological processes after the incomplete resection of the appendix.

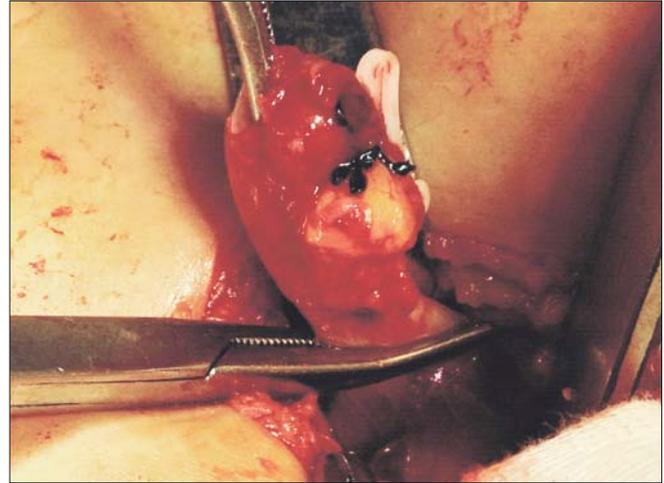
### Case report 1

*J. A.* a 26-year-old female was admitted to our department for acute lower abdominal pain, altered general health, fever and lack of appetite. She was diagnosed and treated for mononucleosis and is diagnosed with Hashimoto's thyroiditis.

Two months prior to admission the patient underwent a laparoscopic appendectomy in a different surgical service. The surgery lasted approximately two hours; drainage of the cul-de-sac Douglas was performed. She was discharged on the third postoperative day after an uneventful recovery. Two weeks following surgery the patient reports to an emergency department for progressive pain in the lower abdomen; she is diagnosed with a pelvic inflammatory disease and treated with oral antibiotics and analgesics. The patient presents with the same symptoms 3 days later at a gynecological service and is diagnosed with vulvovaginitis for which she is administered oral antibiotics (Cefuroxim). An ultrasound performed several days later (same symptoms) reveals bilateral kidney micro-lithiasis for which she is given oral ciprofloxacin, metronidazole and analgics. Following this prolonged course of antibiotics and pain-killers the patient reports a decrease in the intensity of abdominal pain and a remission of the fever. Three weeks later, following a period of chronic lower abdominal pain and sub-fever she presents to our department.

Physical examination reveals a patient of normal BMI (23.2 kg/m<sup>2</sup>), with tachycardia (110 bpm) and fever (axillary – 39.1°C). She has a tender lower abdomen with muscle reaction in the right iliac fossa and a palpable, painful tumor of about 10 cm in diameter in the right lower quadrant. Rebound tenderness and Mandell's sign are present. CBC reveals 17000 WBC/uL, usual biochemistry and coagulation tests are normal. Abdominal ultrasound reveals distended bowel loops in the right lower quadrant surrounded by liquid and liquid in the cul-de-sac Douglas. It also finds a tumoral mass on the right-hand side of the uterus. Gynecological examination is normal.

Based on the clinical and ultrasound findings she is taken to the OR with the diagnosis of acute abdomen and the diagnostic suspicion of stump appendicitis. A McBurney incision reveals a phlegmonous appendiceal stump of about 4 cm (Fig. 1), multiple collections of pus between the bowel loops and a localized peritoneal reaction with false membranes. Resection of the appendiceal stump and its remaining mesoappendix is performed, followed by thorough irrigation and drainage of the



**Figure 1.** Appendiceal stump; intraoperative finding



**Figure 2.** Resection specimen. Mesoappendix (left) and appendiceal stump (right) with endo-clips and thread ligation



**Figure 3.** Appendiceal stump – resection specimen

peritoneal cavity. The specimen reveals several endo-clips on the mesoappendix and thread ligation of the appendix at about 4 cm from its base (Fig. 2, 3).

Postoperative course is favorable. She is administered i.v. Sulperazone and analgesics. Bowel movement was reported

on postoperative day four and drainage was removed. She is discharged on the sixth postoperative day with minimal pain and total digestive tolerance. One month follow-up reveals a patient in good general health with no complaints.

### Case report 2

*P.M., a 40-year-old male, was admitted to our department for a tumor in the right iliac fossa with local pain that had appeared approximately 2 weeks prior. The patient underwent an open appendectomy approximately 15 years prior to admission for which he could not provide any documents. He is otherwise healthy and reports no other diseases. He is overweight (BMI - 28), denies smoking and alcohol consumption.*

*Following his appendectomy he has had numerous (approximately 7) minor surgeries for inflammatory phenomena involving the skin around the incision, labelled as suture infection, that resulted in skin incisions and debridement.*

*Clinical examination reveals a symmetric and non-distended abdomen, with a hypertrophic scar in the right iliac fossa that presents erythema, swelling and pain. A collection of pus is noted at this level with a central ulceration and expression of white, viscous fluid. On exertion and coughing, a tumor protrudes in the right iliac fossa. The rest of the clinical examination is unremarkable. His blood count, biochemistry, coagulation tests, EKG and pulmonary x-ray are within normal parameters.*

*The patient is operated on under spinal anesthesia for an infected incisional hernia in the right iliac fossa. Surgery reveals a small collection of pus in the dermis, a small (about 2 cm in diameter) parietal defect and a hernia sac with no content; excision of the scar tissue and of the ulcerated and inflamed skin area is performed. After the excision of the hernia sac the abdominal wall is closed with interrupted monofilament 0 sutures. After subcutaneous extensive debridement and lavage the skin is closed. Histological analysis reveals a foreign body reaction at skin level and a mucosal fragment in the underlying structures that resembles the appendix.*

*Postoperative course is uneventful in the first three days with no abdominal pain, clean dressing and resolution of bowel movements. On the fourth postoperative day the patient is feverish; his WBC count is 15000 and reports pain in the right iliac fossa and emesis. On clinical examination the patient has a distended abdomen and presents guarding in the right iliac fossa. Ultrasound examination of the abdomen finds fluid in the abdominal cavity. The patient is operated on under general anesthesia revealing an inflamed appendiceal stump with a localized peritoneal reaction. Appendectomy is performed followed by peritoneal lavage and drainage. The abdominal cavity was inspected during surgery and revealed no other injuries. Histological examination of the resected specimen revealed an inflamed appendiceal stump. Postoperative evolution was uneventful. The drainage was removed on the third postoperative day after the first bowel movement. A follow-up consult one month after surgery showed a patient in good general health with no symptoms.*

## Discussion and Conclusions

Amyand is credited with performing the first appendectomy in 1735. Later, in 1886, Reginald Fitz was the first to describe the clinical features and abnormalities of acute appendicitis. The first to describe stump appendicitis for patients who had previously undergone an appendectomy for appendicitis was Rose in 1945 (7).

Postoperative complications after appendectomy include wound infection, intra-abdominal abscess, retrocecal abscess, intestinal perforation with peritonitis, bleeding and adhesions. Stump appendicitis is a rare delayed complication of appendectomy. Its incidence is one in about 50000 cases (8) although the incidence might be higher due to underestimation of the entity.

The problem today is that surgeons or physicians in the ER need to be more aware that stump appendicitis exists and consider it in the differential diagnosis of patients with right iliac fossa pain. The presenting symptoms are indistinguishable from those of primary appendicitis. Pain that starts periumbilically and radiates to the right iliac fossa is a constant sign, often coupled with anorexia, nausea and emesis.

There is the notion that laparoscopic appendectomy is a risk factor for stump appendicitis. The main incriminating features of laparoscopy are lack of a 3-dimensional view and lack of tactile feedback. This assumption is contradicted by a study of Liang et al. that shows that about 66% of stump appendicitis follows open appendectomy (9).

There are three basic methods for treating the stump of the appendix: simple ligation, ligation and inversion, and inversion without ligation (10). No agreement exists on which is the best method. Several authors recommend a stump shorter than 3-5 mm at appendectomy in order to avoid this complication. Identification of the appendiceal-cecal junction is mandatory for this as many appendectomies can be carried out without proper dissection of the retrocecal subserous appendix. For the proper identification it is important to dissect and ligate the recurrent branch of the appendiceal artery and to follow the taenia coli to the base of the appendix (11,12). Treatment of stump appendicitis can be performed laparoscopically, as laparoscopy often helps in the differential diagnosis (13).

Surgeons need to have a heightened awareness of the possibility of stump appendicitis, identify the appendiceal base correctly and remove the appendix without leaving a stump or leaving a stump < 3 mm.

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