



## A Late-onset Psoas Abscess Formation Associated with Previous Appendectomy: A Case Report

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### ▶ ABSTRACT

Psoas abscesses could originate from an adjacent source of infection in the abdominopelvic cavity known as a secondary complication of acute appendicitis. However, it is considered as a very rare event when occurring late after the presentation of appendicitis. Whether it is the source or complication of acute appendicitis following appendectomy remains unclear. A 25-year-old man was admitted to our center with fever and abdominal pain. His past medical history was unremarkable except for having an acute appendicitis and complicated appendectomy 4 years before presenting illness. On admission, the patient was febrile with right lower quadrant abdominal tenderness and moderate leukocytosis. The Abdominopelvic CT-scan revealed a large right psoas muscle than the opposite site, that contained a hypodense mass measuring 6 cm in diameter with extension into right iliacus and internal oblique muscles. The patient underwent subsequent percutaneous abscess drainage under image guide and concurrent broad-spectrum antibiotic therapy.

**Keywords:** Late-onset psoas abscess formation; Complicated acute appendicitis; Appendectomy.

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### Introduction

The psoas abscess is a collection of pus within the surrounding fascia of the iliopsoas muscle [1]. It has been considered a rare entity with a universal incidence of 12 new cases per year [2]. However, the condition has been detected more frequently in recent years [3]. There are two distinct forms of abscess formation in the psoas muscle. The primary form, known as the predominant form, originates from a distant source of infection disseminated via hematogenous spread. In the secondary form,

a local infection or inflammatory process of adjacent structures such as vertebrae, kidneys, bowel, pancreas and appendix is contagiously spread into the psoas muscle. The common underlying causes of the secondary form include appendicitis, diverticulitis, inflammatory bowel disease, pyonephrosis, pyelonephritis and post-operative infections. Sometimes, a neoplastic process especially of the bowel is the primary focus leading to a psoas abscess formation [4-6]. Despite the theoretical concept of retroperitoneal perforation of the appendix as an etiology for

retroperitoneal abscesses, the number of patients reported with this condition is significantly rare [7]. The rarity of cases with a late-onset psoas abscess is highly striking, since there is only one reported case of actinomycotic abscess of psoas muscle detected 10 years after appendectomy [8]. The present study introduces a case with a psoas abscess appearing 4 years after appendectomy with a culture positive for *E. coli*.

### Case report

A 25-year-old man from Kangan, southern Iran, was referred to the emergency department of our center with a 7 days history of intermittent fever and progressive right lower quadrant abdominal pain. The patient complained of nausea, a few episodes of vomiting and mild loss of appetite since the presentation of illness. He did not mention any discomfort in the groin or thigh and had not experienced any difficulty in walking. Reviewing his past medical history revealed an acute appendicitis treated by open appendectomy 4 years prior to present admission documented by a pathologic report of an acute suppurative type without obvious gangrene or perforation. The patient was admitted one week after the appendectomy due to surgical site infection due to incision and drainage of the site of operation and concurrent intravenous antibiotic therapy. The physical examination revealed an ill-looking young man with no remarkable posture with the ipsilateral hip kept flexed. The core body temperature was 38.2 °C. The blood pressure, respiratory rate and pulse rate were 120/80 mmHg, 16/min and 84 bpm respectively. He had moderate tenderness of right lower quadrant of the abdomen which became severe on deep palpation, and, mild localized rebound tenderness in the same area. When extending the right hip, the patient felt much more discomfort than before. No abdominal or flank mass was detected. The lab data showed a moderate leukocytosis (16600), predominantly polymorphonuclear (PMN) cells. The other blood tests were all normal except a mild hemoconcentration corrected the day after early fluid resuscitation and empirical antibiotic therapy with a decrease in the Hb from 15.1 g/dL to 13.5 g/dL. The plain abdominal X-ray demonstrated no abnormality. In the abdominopelvic sonography, an echogenic nodule measuring 6 mm was detected in the right liver lobe which was probably a hemangioma. A hypoechoic area was noted in the depth of this region. The abdominopelvic CT-scan with IV and oral contrast revealed a larger right psoas muscle than the opposite site which contained a hypodense mass measuring 60×40 mm, and extending into right iliacus and internal oblique muscles. The fat stranding



**Fig. 1.** Axial computed tomographic scan of the abdominopelvis demonstrating a right larger psoas muscle containing a hypodense area suggestive of a psoas abscess

that extended into the right posterior perinephric space was noted in the above mentioned region (Figure 1). The patient then underwent percutaneous drainage of psoas abscess and a percutaneous catheter was placed in the site of drainage with concurrent intravenous therapy by Imipenem. The culture prepared from the pus aspirate only yielded many colonies of *Escherichia coli* with convincing sensitivity to Imipenem. Symptoms disappeared soon after the percutaneous aspiration of abscess and the patient became afebrile after 2 days. The catheter irrigation was then discontinued and he was discharged after 5 days hospitalization in total.

### Discussion

The retroperitoneal abscess formation may be a serious complication of the acute appendicitis which faces the physicians with difficult diagnosis and early treatment due to its insidious onset and various presentations. It may be located in anywhere in the retroperitoneum including the psoas muscle with probable extension to the thigh [7]. The etiopathogenesis of psoas abscesses has been changed over time. *Mycobacterium tuberculosis* was the main cause before the advent of anti-TB drugs and its control by worldwide strategies [2]. Nowadays, *Staphylococcus aureus* is considered as the most common microorganism responsible for primary psoas abscesses [9-12]. Although the main microbial sources of the secondary forms has not yet been established, the *Escherichia coli* is believed to be the leading cause of primary psoas abscesses as reported by Lin MF *et al.*, [13]. The etiology of the secondary form reflects the underlying pathologic cause, so that the enteric pathogens are incriminated as common microorganisms responsible for infection [2]. Apart from these two bacteria, other possible microbial

etiologies involve *Proteus mirabilis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Bacterioides fragilis*, *Serratia marcescens*, *Streptococcus viridians*, *Streptococcus epidermidis*, *Salmonella* spp. and sometimes *Brucella* spp. in both primary and secondary abscesses [6,11,13-15]. The most frequent manifestations of the psoas abscess include unilateral flank and lower abdominal pain and to some extent low back pain. These symptoms are accompanied by some degrees of inability to walk in some patients. In physical examination, the patient sometimes exhibits unilateral hip kept flexed due to the pain. A painful mass of the flank or lumbar region is another sign of the psoas muscle involvement. There are some constitutional symptoms and signs including anorexia, malaise and fever [12,16,17]. Because the condition is often misleading, using a radiologic modality such as CT-scan is useful to identify the abscess, designating its characteristics and planning for the best treatment [18]. The most common finding of the CT-scan is entire enlargement of the ipsilateral psoas muscle containing a low density area which demonstrates the focus of abscess [19]. The treatment is best established by prescribing broad-spectrum antibiotics combined with abscess drainage via open surgery or percutaneously [2].

The literature review did not show any late-onset psoas abscess formation post-appendectomy caused by *E.coli*. The Late-onset psoas abscess formation is reported in a few cases from 3 to 27 years after ipsilateral nephrectomy due to nephrolithiasis, pyonephrosis and xanthogranulomatous pyelonephritis [6]. Chen YC *et al.* reported a case with left psoas abscess whose past medical history was not significant except for an appendectomy and a cesarian section, both occurring more than 10 years prior to presenting illness [20]. The contralateral presentation of the psoas abscess and the long period since the time of appendectomy

did not inspire the physicians to consider previous acute appendicitis and its complications as a probable source of present abscess. Lapus RM *et al.* introduced a 10-year-old boy with a retroperitoneal mass in the radiologic evaluation containing calcifications which suggested a retained appendicolith with abscess formation. The review of his past medical history revealed an acute perforated appendicitis treated by an interval appendectomy 2 years before current illness [21]. The authors considered it as a late uncommon complication of appendicitis. Another case of late retroperitoneal abscess formation was reported by Moosmayer S, which was within the right psoas muscle and presented 10 years after appendectomy with pus aspirate containing *Actinomyces Israeli* [8]. Reviewing the literature, the reason for late appearance of psoas abscess is still unknown. It may be related to the complications of acute appendicitis such as micro-perforation causing a small abscess formation soon after the presentation of appendicitis which remains undetected until the abscess becomes large enough to make the patient symptomatic. Another leading process could originate from the complications of appendectomy including infected hematoma and infected tissue remnants. However, these two likely hypotheses require further multicenter case reports in order to identify the most common pathologic process contributing to the late-onset psoas abscess formation.

In conclusion, the late-onset psoas abscess formation may be a very rare complication of acute appendicitis or a post-surgery event, especially when an enteric pathogen such as *E. coli* is found to be the microbial etiology of the focus of infection. The similar approach to the other psoas abscesses is required to relieve the patient from bothersome symptoms.

**Conflict of Interest:** None declared.

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