

Psoas abscess: report of a series and review of the literature

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ABSTRACT

We describe a series of 12 patients with a psoas abscess seen in a three-year period in a university hospital and a large teaching hospital in the Netherlands. In our series, five of the 12 patients had a primary psoas abscess. The predisposing conditions were intravenous drug use, diabetes mellitus, prostate carcinoma and haematoma in the psoas muscle in a patient with haemophilia A. Seven of the 12 patients had a secondary psoas abscess. Five cases were due to vertebral osteomyelitis including two cases of tuberculosis. In the other two cases it was due to colitis and urinary tract infection. It is remarkable that in our series there was only one patient with a psoas abscess secondary to a disease of the digestive tract, while this is the most common cause of a secondary psoas abscess in the literature. There were two cases of tuberculosis which is an emerging disease again.

KEYWORDS

Case series, psoas abscess

INTRODUCTION

Psoas abscess is regarded as a rare disease in the medical literature. The incidence is not known but it has probably increased in recent years. The causes of psoas abscess in the Western world have also changed in the last decades. At the beginning of the 20th century psoas abscess was mainly caused by tuberculosis of the spine (Pott's disease).

With the decline of *M. tuberculosis* as a major pathogen in developed countries a psoas abscess was mostly seen secondary to diseases of the digestive tract.¹ In recent years a primary psoas abscess due to haematogenous spread from an occult source is more common, especially in immunocompromised and older patients.^{2,3} In addition, tuberculosis is on the increase again because of immigration and HIV infections in risk groups. In this report we describe four patients out of 12 seen in the last three years in a university hospital and a large teaching hospital in the Netherlands. We present four clinical case histories, demonstrating the various clinical presentations.

METHODS

We reviewed clinical data from patients who were classified with a psoas abscess in the period from June 2001 to June 2004 at the Erasmus Medical Centre Rotterdam and Catharina Hospital, Eindhoven in the Netherlands.

RESULTS

In this period 12 cases met the diagnosis of psoas abscess, five from Catharina Hospital and seven from Erasmus Medical Centre. The average age was 55 years (range 25 to 82) with a male-female ratio of 5:7. Five of the 12 patients had a primary psoas abscess, while seven had a secondary psoas abscess. Two of the 12 patients died. Characteristics of the patients are shown in *table 1*.

Table 1 Characteristics of patients with a psoas abscess seen in the period June 2001 to June 2004 in Erasmus Medical Centre Rotterdam (EMCR) and Catharina Hospital, Eindhoven (CHE)

No.	Sex	Age	Hospital	Predisposing condition	Location	Micro-organism	Primary/secondary	Outcome
1	M	46	CHE	No	Right	<i>Staphylococcus aureus</i>	Primary	Favourable
2	V	38	EMCR	IV drug user	Both sides	<i>Staphylococcus aureus</i>	Primary	Favourable
3	M	67	CHE	Prostate carcinoma	Right	<i>Staphylococcus aureus</i>	Primary	Favourable
4	V	80	CHE	DM	Right	<i>Staphylococcus aureus</i>	Primary	Died
5	M	59	EMCR	Haematoma in psoas muscle	Left	<i>Staphylococcus aureus</i>	Primary	Favourable
6	V	82	CHE	No	Both sides	<i>Staphylococcus aureus</i>	Secondary to osteomyelitis of the spine	Favourable
7	V	43	EMCR	Homeless	Left	<i>Mycobacterium tuberculosis</i>	Secondary to osteomyelitis of the spine	Favourable
8	V	25	EMCR	No	Left	<i>Mycobacterium tuberculosis</i>	Secondary to osteomyelitis of the spine	Favourable
9	M	48	EMCR	IV drug user	Left	<i>Enterobacter cloacae</i>	Secondary to osteomyelitis of the spine	Favourable
10	V	55	EMCR	DM	Both sides	<i>Escherichia coli</i>	Secondary to osteomyelitis of the spine	Favourable
11	V	48	EMCR	No	Left	<i>Escherichia coli</i>	Secondary to urinary tract infection	Favourable
12	M	75	CHE	CLL, DM	Right	<i>Klebsiella pneumoniae</i>	Secondary to colitis	Died

CLL = chronic lymphatic leukaemia; DM = diabetes mellitus.

Clinical case histories

Patient A

A 46-year-old man was admitted with fever and pain in the right buttock radiating to the right leg, which started after a strenuous walk in the mountains two weeks before admission. Physical examination was normal. Laboratory studies showed an ESR of 80 mm/h, haemoglobin 8.8 mmol/l, white cell count $8.7 \times 10^9/l$ and C-reactive protein 159 mg/l. The other chemistry tests performed were normal. Blood cultures yielded a growth of *Staphylococcus aureus*. A CT scan of the abdomen showed an abscess of 2.5 cm in the right iliac muscle (figure 1). MRI scan of the thoracic and lumbar spine did not reveal a spondylodiscitis. An echocardiogram did not show vegetations. He was treated with flucloxacillin 6 g/day intravenously for six weeks. A CT scan after six weeks showed that the abscess had disappeared.

Patient B

An 80-year-old woman was admitted with pain in the right buttock for one month. Her medical history included hypothyroidism and type 2 diabetes mellitus complicated by nephropathy, peripheral arterial disease and coronary heart disease. On physical examination her temperature was 38 °C. There was no heart murmur. Pain could be provoked by applying pressure to the right side of the sacral area. Laboratory studies showed an ESR of >140 mm/h, haemoglobin 4.2 mmol/l, white cell count $17.1 \times 10^9/l$, C-reactive protein 245 mg/l, glucose 9.1 mmol/l and creatinine 180 µmol/l. Other chemistry tests were normal. All six blood cultures were positive for *S. aureus*. A transoesophageal echocardiogram did not show any vegetation. An MRI scan of the pelvis showed a psoas abscess of 5 x 12 cm on the right side (figure 2). There was no imaging of the thoracic spine. The abscess was drained percutaneously

Figure 1 Transverse contrast-enhanced CT scan of patient A, showing a hypodense lesion with enhancing rim in the right iliac muscle, typically an abscess

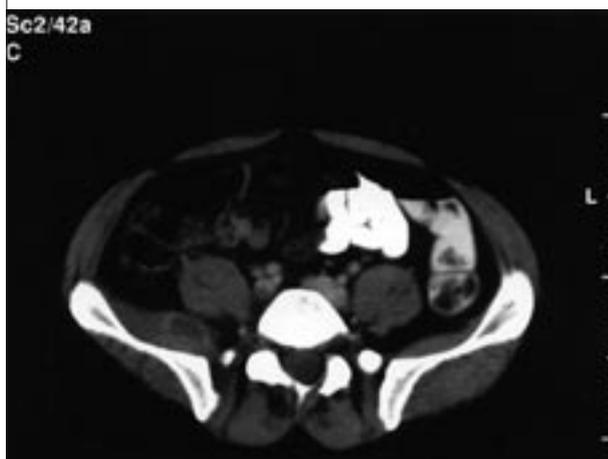
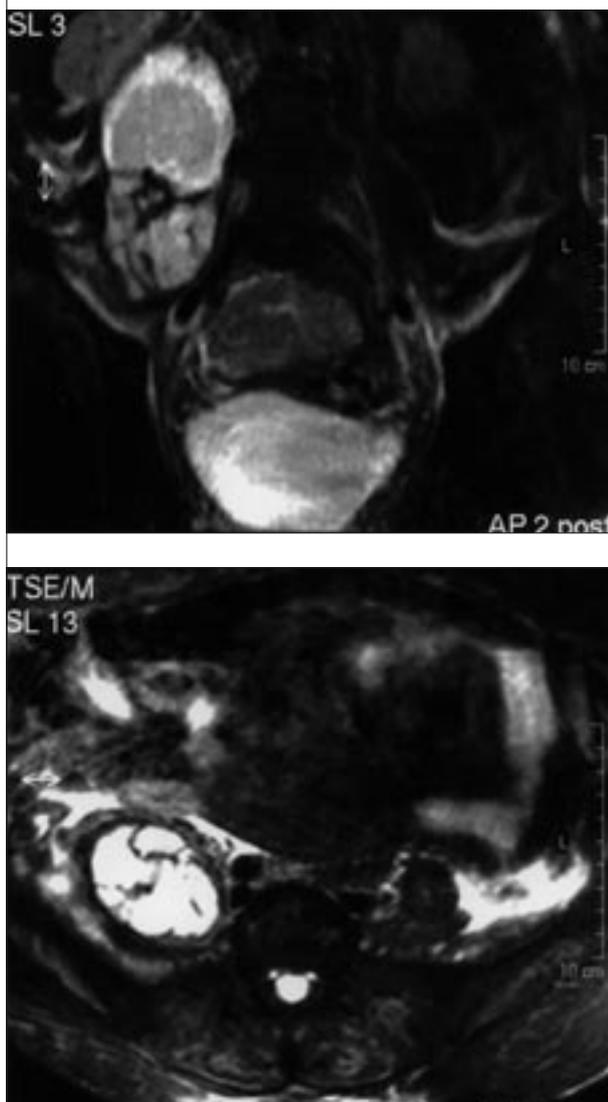


Figure 2 Coronal and transverse T2-weighted MRI scan of patient B, showing a septated abscess in the right psoas muscle



and the patient was treated with flucloxacillin 6 g/day iv. After four weeks the flucloxacillin was switched to oral medication for another two weeks because of several episodes of phlebitis. A CT scan after six weeks showed disappearance of the abscess. After one month she was admitted again because of rectal bleeding. She had fever and a blood culture was again positive for *Staphylococcus aureus*. An MRI scan of the spine revealed a spondylodiscitis between the 9th and 10th thoracic vertebrae. She was treated with flucloxacillin 12 g/day iv. After one month she died of a cerebrovascular accident. Autopsy was refused.

Patient C

A 48-year-old man was admitted with pain in the back, and fever. His medical history included epilepsy and a nephrectomy after a shoot wound. He was an intravenous drug user. On physical examination he had a temperature of 37.5 °C. He had pain when applying pressure to the lumbar spine. Laboratory results showed haemoglobin 6.9 mmol/l, white cell count $10.5 \times 10^9/l$, and C-reactive protein 154 mg/l. MRI of the spine showed an osteomyelitis of L3 to L5 and a small psoas abscess with a diameter of 2 cm to the left. A blood culture yielded *Enterobacter cloacae*. Urinary cultures were sterile. He was treated successfully with ciprofloxacin 750 mg twice a day orally for six weeks.

Patient D

A 43-year-old woman was referred to the gynaecologist with amenorrhoea for seven months and a distention of her abdomen. She is a homeless prostitute who uses cocaine. She lost 20 kg in weight in four months time but had no fever. She complained of having pain in her left leg for more than one year. A sonography showed a process with multiple cysts in the lower left abdomen. A laparotomy was performed and a large psoas abscess of 10 to 20 cm was found. The abscess was drained and cultures showed *Mycobacterium tuberculosis*. MRI of the lumbar spine showed osteomyelitis of L2 and L3 with a paravertebral abscess. She was treated with rifampicin, ethambutol, isoniazid and pyrazinamide, and ethambutol for nine months.

DISCUSSION

In our series, five out of 12 patients had a primary psoas abscess. In all of them *S. aureus* was the causative agent. The predisposing conditions were intravenous drug use, diabetes mellitus, prostate carcinoma and haematoma in the psoas muscle in a patient with haemophilia A. In literature *S. aureus* is found in 88% of the cases of primary psoas abscess followed by streptococci (5%) and *Escherichia coli* (3%). A history of recent muscle trauma was revealed in 20% of the cases.⁴ Experimental data have shown that only after a muscle is injured an intravenous injection with *Staphylococcus aureus* can produce a pyomyositis.⁵

Patient A had no known predisposing condition. He was possibly susceptible to developing a primary psoas abscess due to a muscle trauma after a strenuous walk in the mountains.

A primary psoas abscess is predominant in developing countries; however, in the Western world primary psoas abscess has become more prevalent, especially in immunocompromised patients.^{2,3} This group includes intravenous drug abusers, HIV-infected persons and patients with chronic illness or malignancies.

Seven of the 12 patients had a secondary psoas abscess. In five cases this was due to vertebral osteomyelitis including two cases of tuberculosis. In the other two patients it was secondary to colitis and urinary tract infection.⁶

In a large review the most common cause of secondary psoas abscess was Crohn's disease (60%). Other causes are appendicitis (16%), ulcerative colitis, diverticulitis, colon cancer (together 11%) and vertebral osteomyelitis (10%).⁴ In secondary psoas abscess cultures are often mixed, with *E. coli* and *Bacteroides* spp predominating. Other organisms include enteric pathogens, *Staphylococcus* spp and *Streptococcus* spp.⁴

It is remarkable that in our series there is only one patient with a psoas abscess secondary to a disease of the digestive tract, although the Erasmus Medical Centre is a referral centre for Crohn's disease.

In our series there were five patients with a psoas abscess secondary to an osteomyelitis of the spine.⁷ Vertebral osteomyelitis is primarily a disease of adults; the majority of patients are over 50 years of age.⁸ Haematogenous spread from an occult source is the most common route of infection. *S. aureus* accounts for more than 50% of the cases of vertebral osteomyelitis. Psoas abscess is regarded as secondary to vertebral osteomyelitis in most cases, but since both infections are caused by haematogenous spread from an occult source, they may also have developed simultaneously. In addition, secondary infection of the spine due to a psoas abscess has also been described.⁹ In patient B the relationship between the psoas abscess and the vertebral osteomyelitis is not clear since at presentation no MRI of the thoracic spine was performed.

Two of the patients in our series had a psoas abscess secondary to tuberculous osteomyelitis. Although this used to be the most common cause, it had almost disappeared until recently. Tuberculosis of the spine without a psoas abscess was diagnosed in at least five additional cases in the selected study period in the Erasmus Medical Centre in Rotterdam (data not shown).

In our series four patients were treated with antibiotics only. Two patients had a small psoas abscess which was less than 3 cm. One patient with a psoas abscess of 7.5 cm was successfully treated with antibiotics only, while the other patients who had a psoas abscess of 5 cm died of comorbidity. Six patients underwent percutaneous drainage

which was successful in all cases. However, one patient died of a cerebrovascular accident. Two patients were treated with surgical drainage.

Percutaneous drainage has the advantage of being less invasive. However, in one case series surgical drainage was correlated with a shorter hospital stay compared with percutaneous drainage.³ In the case of secondary psoas abscess, surgical drainage can be combined with resection of diseased bowel. Antibiotics are given guided by blood cultures, Gram stains and cultures of the abscess.

If antibiotics are given empirically, *S. aureus* should be covered in the case of primary psoas abscess, and in secondary abscess broad-spectrum antibiotics should be given covering aerobic and anaerobic bowel flora.

The duration of antibiotic therapy must be individualised, guided by clinical signs, involvement of other structures and laboratory results. In any case antibiotics should be continued for at least two to three weeks after subsiding of fever or after drainage.⁹

In our series two of the 12 patients died (17%). In a review of 367 cases the mortality rates for primary psoas abscess were 2.5% and for secondary psoas abscess 18.9%.⁴ In conclusion, this series demonstrates that psoas abscess is not a very rare condition in major hospitals. Our small series is in accordance to other recent series showing an emerging of primary psoas abscess due to *S. aureus*. In addition, tuberculosis is also emerging again while secondary psoas abscess due to diseases of the digestive tract was remarkably rare in our series.

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