

# Melioidotic prostatic abscess in Pahang

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## ABSTRACT

Melioidosis is caused by *Burkholderia pseudomallei*, a Gram-negative bacillus. Melioidosis can affect many organs, including the prostate. However, prostatic abscess due to melioidosis is uncommon. We describe five cases of melioidosis with prostatic abscess. Four of five patients had diabetes mellitus and had more than one organ involvement. The diagnosis of prostatic abscess in our patients was only made with computed tomography of the abdomen and pelvis. None of our patients underwent surgical drainage and all remained well after treatment with antibiotics, except for one mortality secondary to severe septicaemia.

**Keywords:** *Burkholderia pseudomallei*, melioidosis, melioidotic prostatic abscess, prostatic abscess

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## INTRODUCTION

Melioidosis is caused by *Burkholderia pseudomallei*, a Gram-negative bacillus. It is endemic in both Northern Australia<sup>(1)</sup> and Southeast Asian countries, particularly Malaysia,<sup>(2,3)</sup> Thailand<sup>(4)</sup> and Singapore,<sup>(5)</sup> and sporadic cases have been reported in other parts of the world. Humans acquire the infection by traumatic inoculation of the organism from the soil, or in rare instances, by inhalation or ingestion. It may present in an acute, subacute or chronic form. The acute form commonly presents as pneumonia, fulminant septicaemia or multiple organ involvement. Localised abscesses are frequently encountered in the subacute or chronic form, which may last for months or years. Melioidosis can affect many organs, including the prostate. However, prostatic abscess due to melioidosis is uncommon. Known risk factors for melioidotic prostatic abscess include the elderly diabetic male.<sup>(6)</sup> We describe five cases of melioidosis with prostatic abscesses.

## CASE SERIES

### Case 1

The first case was a 49-year-old Malay man with type 2 diabetes mellitus, hypertension and a previous history of left thumb abscess where incision and drainage (I&D) was done in September 2005. He was admitted again one month later to Hospital Tengku Ampuan Afzan, Kuantan,

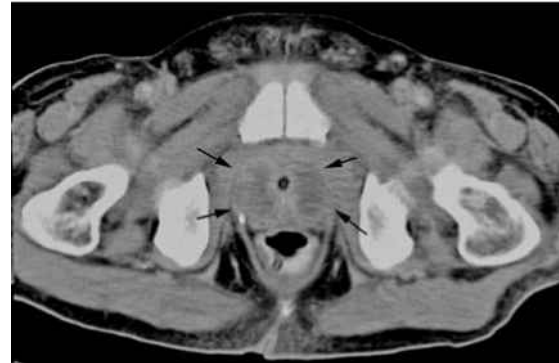


Fig. 1 Axial contrast-enhanced CT image shows multiple rim-enhancing hypodense lesions in both lobes of the prostate (arrows), suggestive of multiple prostatic abscesses. No involvement of the adjacent structures is present.

with a fever for two weeks associated with epigastric pain and unproductive cough. He had no urinary symptoms. Physical examination revealed high-grade fever, left basal lung crepitation and mild left hypochondrial tenderness. There was no hepatosplenomegaly. Ultrasonography (US) of the abdomen showed multiple splenic abscesses and blood culture grew *Burkholderia pseudomallei*. Computed tomography (CT) of the abdomen showed multiple hypodense lesions in the spleen and both lobes of the prostate with rim enhancement (Fig. 1), suggestive of multiple splenic and prostatic abscesses.

He was treated with intravenous (IV) ceftazidime 2 g eight-hourly and amoxicillin-clavulanic acid 1.2 g eight-hourly for three weeks, and was discharged with oral ciprofloxacin 400 mg twice daily and amoxicillin-clavulanic acid 375 mg twice daily. However, he defaulted on treatment and follow-up. In May 2006, he presented with a two-week history of high grade fever with abdominal pain, loss of appetite and weight. The blood culture grew *Burkholderia pseudomallei*. CT of the abdomen and pelvis revealed multiple small splenic and prostatic abscesses. He was treated with IV ceftazidime 2 g eight-hourly for one month and was discharged well with oral maintenance therapy. However, after one month of maintenance therapy, he again defaulted on treatment and follow-up.

In July 2007, he was again admitted for a second relapse of melioidosis with lung and left thigh abscess. Per rectal examination which was done before starting antibiotic treatment revealed an enlarged and non-tender prostate. He had no abnormal urinary symptom. CT

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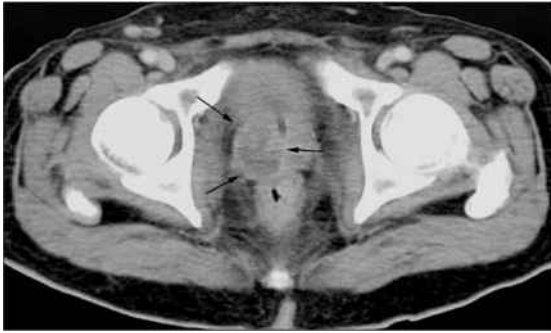
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**Fig. 2** Axial contrast-enhanced CT image shows a rim-enhancing hypodense lesion in the right lobe of the prostate (arrows), suggestive of a prostatic abscess. No involvement of the adjacent rectum and periprostatic fat is present.

was not done in view of concern for contrast-induced nephropathy, as he had a creatinine clearance of 16 ml/min. Magnetic resonance imaging of the left thigh showed left thigh intramuscular abscesses, which were drained. Culture from both his blood and pus from the left thigh grew *Burkholderia pseudomallei*. His urine culture had no growth. The patient was given 32 days of IV ceftazidime 1 g eight-hourly and discharged well with oral sulfamethoxazole-trimethoprim three tablets twice daily and oral doxycycline 100 mg twice daily for 20 weeks.

#### Case 2

The second case was a 41-year-old Malay male lorry driver with underlying type 2 diabetes mellitus and treated pulmonary tuberculosis (PTB) in 2003. He was admitted in August 2005 with a productive cough for two months, associated with loss of weight and appetite and intermittent fever. He also had loose stools and generalised abdominal pain three days prior to admission. He did not have any abnormal urinary symptom. Physical examination revealed a high-grade fever and left lung basal crepitations, but no hepatosplenomegaly. There was no documentation of per rectal examination of the prostate of this patient. US of the abdomen showed a left lobe liver abscess measuring 10 cm × 6.8 cm × 10 cm. A chest radiograph did not suggest the reactivation of PTB. Blood culture grew *Burkholderia pseudomallei*. His urine culture had no growth.

CT of the abdomen showed a left lobe liver abscess and multiple rim-enhancing hypodense lesions in the enlarged prostate, consistent with abscess formation. Ultrasound-guided drainage of the liver abscess was done. Culture of the pus from the liver abscess yielded no growth. He was given 47 days of IV ceftazidime 2 g eight-hourly and oral sulfamethoxazole-trimethoprim three tablets twice daily followed by 20 weeks of oral sulfamethoxazole-trimethoprim three tablets twice daily and amoxicillin-clavulanic acid 375 mg twice daily.

Repeated CT of the abdomen three months later showed a resolved liver and prostatic abscess. He made a good recovery and remained well two years after discharge.

#### Case 3

The third case was a 50-year-old male rubber tapper with underlying type 2 diabetes mellitus and a previous history of left buttock subcutaneous abscess in May 2005. I&D was done and he was discharged well. He was admitted again in January 2006 with fever for two weeks associated with a productive cough for four days, and loss of weight and appetite. US and CT of the abdomen showed a left lobe liver abscess, and he was treated conservatively with antibiotics by the surgical team. Blood culture showed no growth at that time. The patient was readmitted four months later with vomiting, poor oral intake and diarrhoea for two weeks, with intermittent fever and generalised abdominal discomfort. There was no documentation of per rectal examination of the prostate of this patient. No urine culture was done in this patient.

Repeat CT of the abdomen then showed a resolving liver abscess seen previously in the left lobe, but there were multiple new lesions in the liver and spleen suggestive of early abscesses. CT also showed small rim-enhancing hypodense lesions in the left lobe of the prostate, consistent with abscess formation. His blood culture was negative and melioidosis serology in January 2006 was 1:320, which rose to 1:640 in May 2006. He was treated for melioidosis with multiple organ abscesses. He was given 35 days of IV ceftazidime 2 g eight-hourly, followed by oral sulfamethoxazole-trimethoprim three tablets twice daily and oral doxycycline 100 mg twice daily for 20 weeks. Repeat CT of the abdomen in June 2006 showed resolving liver, splenic and prostatic abscesses. He made a good recovery and remained well one year after discharge.

#### Case 4

The fourth case was a 50-year-old Indian man who had underlying type 2 diabetes mellitus, hypertension and old PTB. He presented to us with fever associated with lethargy, loss of appetite, symptoms of hyperglycaemia, and right foot swelling with pus discharge. He had no chest or urinary symptoms. Physical examination revealed high-grade fever and bilateral basal lung crepitation with no hepatosplenomegaly. Per rectal examination, which was done after being given antibiotics, showed an enlarged non-tender prostate. He was initially treated for right foot abscess. I&D was done and he was administered IV ampicillin-sulbactam 1.5 g eight-hourly. However, his general condition did not improve and his fever persisted. IV ceftazidime was started and was changed to IV meropenem two days later, as the patient became more toxic and delirious. His blood culture grew

Table I. Summary of five cases of melioidosis with prostatic abscess.

Case	Age (years)	Past medical illness	Clinical presentation	Organ involvement	Evidence of melioidosis	Treatment	Complication	Outcome
1	49	DM, HPT	Fever, cough, abdominal pain, LOA, LOW	Splenic, liver and prostatic abscess, pneumonia	Blood culture	Intensive: IV Fortum 2 g 8 hourly & IV Augmentin 1.2 g 8 hourly × 3 weeks. Maintenance: oral ciprofloxacin 400 mg bd & Augmentin 375 mg bd for 20 weeks.	None	Defaulted with relapse
2	41	DM	Fever, cough, abdominal pain, diarrhoea, LOA, LOW	Prostatic abscess, pneumonia	Blood culture	Intensive: IV Fortum 2 g 8 hourly × 47 days. Maintenance: oral Bactrim 3 tablets bd & Augmentin 375 mg bd × 20 weeks	None	Well
3	50	DM	Fever, cough, abdominal pain, diarrhoea, LOW, LOA	Liver, splenic and prostatic abscess	Blood culture negative; Melioidosis serology was 1:320 & rose to 1:640	Intensive: IV Fortum 2 g 8 hourly × 35 days. Maintenance: oral Bactrim 3 tablets bd & oral doxycycline 100 mg bd × 20 weeks	None	Well
4	50	DM, HPT, Old PTB	Fever, right foot abscess, LOA, LOW	Splenic, prostatic and soft tissue abscess	Blood	Intensive: IV meropenam 1 g 8 hourly for 2 weeks. Maintenance: oral Bactrim 3 tablets bd & doxycycline 100 mg bd for 24 weeks	None	Well
5	40	Nil	Fever with productive cough, urinary symptoms	Prostate and liver abscess, pneumonia, septic arthritis	Blood	IV Fortum for 3 weeks	Septic shock	Dead

LOA: loss of appetite; LOW: loss of weight; DM: diabetes mellitus; HPT: hypertension; PTB: pulmonary tuberculosis; Fortum: ceftazidime; Bactrim: sulfamethoxazole-trimethoprim; Augmentin: amoxicillin-clavulanic acid; bd: twice daily

*Burkholderia pseudomallei* and pus from the right foot abscess grew *Pseudomonas aeruginosa*. His urine culture had no growth. CT of the brain was normal.

CT of the abdomen showed multiple small splenic abscesses, bilateral minimal pleural effusion, bibasal parenchymal infiltrates and a rim-enhancing hypodense lesion in the right lobe of the prostate, suggestive of an abscess (Fig. 2). He was given two weeks of IV meropenem 1 g eight-hourly, and was discharged well with sulfamethoxazole-trimethoprim three tablets twice daily and oral doxycycline 100 mg twice daily for 24 weeks. Repeat CT of the abdomen and pelvis six months later showed a partial resolution of the previous splenic and prostatic abscesses. However, the patient was well and remained asymptomatic. Both the splenic and prostatic abscesses were not drained.

#### Case 5

The fifth case was a 40-year-old Indonesian palm oil worker, who was admitted in January 2007 with chronic fever for one month which was associated with a productive cough. He had no other significant past medical or surgical history. He was a smoker and chronic alcoholic. He was treated for pneumonia, was given a course of antibiotics (augmentin/erythromycin) and responded well. He was discharged well. Two months later, he was again admitted with an altered sensorium which was associated with vomiting, dysuria and

increased frequency of urination. He had no haematuria. Physical examination showed high-grade fever, stable vital signs and a Glasgow coma scale of 14/15 on admission. There was no lymphadenopathy, jaundice or pallor. There was bibasal crepitation in the lung. There was hepatosplenomegaly. No associated focal neurological deficit or cerebellar sign was present. Cardiovascular examination was unremarkable. Per rectal examination, which was done before starting antibiotics, showed an enlarged but non-tender prostate.

US showed prostatomegaly with an ill-defined hypoechoic lesion, hepatomegaly and splenomegaly with multiple hypoechoic lesions. CT of the abdomen and pelvis showed a small liver abscess in segment VIII measuring 0.8 cm, multiple small splenic abscesses and multiple prostatic abscesses involving the whole prostate gland. CT of the brain was normal. Blood culture confirmed *Burkholderia pseudomallei*. His urine culture had no growth. The patient was treated with IV ceftazidime 2 g eight-hourly. The patient's fever never settled despite three weeks of high-dose IV ceftazidime. He was also noted to have septic arthritis of the left ankle and right knee. The joint effusion was drained. CT of the abdomen and pelvis three weeks later showed partial resolution of the liver, splenic and prostatic abscesses. He developed septic shock, which required inotropic agent support. Unfortunately, the patient succumbed from severe septicaemia.

**Table II. CT findings of prostatic abscess in terms of location, number of lesions, size and appearance.**

Case	CT findings of prostatic abscess					
	Location	No. of lesions	Largest size (cm) of prostate abscess		Appearance	
			Right lobe	Left lobe	Enhancing rim	Septation
1	Both lobes	2	2.0 × 2.5	3.0 × 1.6	Yes	Nil
2	Both lobes	3	2.0 × 4.4	2.3 × 3.5	Yes	Nil
3	Left lobe	1	–	2.0 × 0.6	Yes	Nil
4	Right lobe	1	2.3 × 3.1	–	Yes	Nil
5	Both lobes	4	2.0 × 4.0	2.0 × 2.0	Yes	Nil

## DISCUSSION

Melioidosis can affect many organs, including the prostate. However, prostatic abscess due to melioidosis is uncommon. Tan et al and Aphinives et al have reported cases of melioidosis that presented with primarily melioidotic prostatic abscess.<sup>(6,7)</sup> Two studies reported that melioidotic prostatic abscesses can present with fever and obstructive urinary symptoms.<sup>(1,6)</sup> However, only one out of five of our patients had urinary symptoms on presentation, and he had no obstructive symptom. Digital rectal examination is useful for detecting prostatic involvement, but it cannot differentiate prostatic abscess from acute prostatitis due to other causes. Tan et al found that 85% of their patients with melioidotic prostatic abscesses had enlarged and tender prostates.<sup>(6)</sup> 60% of our patients were found to have an enlarged and non-tender prostate on per rectal examination. There were no documented findings on per rectal examination for the other two patients. Diabetes mellitus is a known risk factor for melioidotic prostatic abscess.<sup>(6,7)</sup> Four of the five patients were diabetic and had multiple organ involvement (e.g. lung, spleen, liver, soft tissue or joint). All of them were not on steroids or had chronic renal failure. There was no isolated melioidotic prostatic abscess in our experience. The presentations and organ involvement in our patients are summarised in Table I.

About 18% of adult males with melioidosis in North Australia had prostatic abscesses,<sup>(1)</sup> compared with fewer than 2% in Thailand.<sup>(8)</sup> In a retrospective review of 135 patients with melioidosis in Pahang from January 2000 to June 2003, there was no case of melioidotic prostatic abscess identified.<sup>(3)</sup> This was because none of them had routine CT of the pelvis and therefore the diagnosis of prostatic abscess was likely to have been missed during the retrospective review. Australia has the highest reported number of cases of melioidotic prostatic abscess because routine CT was done for all their melioidosis patients, whereas patients in Thailand were examined with transrectal ultrasonography only when a prostatic lesion was suspected. However, melioidotic prostatic abscess is not commonly seen in Malaysia, probably due to underdiagnosis, as not all melioidosis patients undergo abdominal and pelvic CT. Furthermore, the diagnosis of prostatic abscess has always been difficult, because of

the lack of pathognomonic symptoms or specific signs.<sup>(9)</sup> Moreover, prostatic abscess is diagnosed in only 0.2% of patients with urological symptoms and in 0.5%–2.5% of patients hospitalised for prostatic symptoms.<sup>(7)</sup> The diagnoses of prostatic abscess in our patients were only made with CT of the abdomen and pelvis. All our patients underwent US of the abdomen and prostate prior to CT, but false negative findings were reported as high as 80% in our patients. Therefore, trans-abdominal US may not be a sensitive enough tool for detecting prostatic abscess. Since October 2005, we have been detecting cases of melioidotic prostatic abscess as all our patients with culture-confirmed melioidosis underwent a routine CT of the abdomen and pelvis. It showed how important CT imaging was in helping to diagnose an asymptomatic prostatic abscess.

CT has been shown to improve the images of prostatic lesions.<sup>(10,11)</sup> CT has also been useful in assessing the extent of suppurative material that had collected in the periprostatic tissue.<sup>(12)</sup> Aphinives et al demonstrated that melioidotic prostatic abscesses in their patients were multiple, rim-enhanced, more than 1 cm, commonly located in the central gland, and half of them involved the whole gland, resulting in gland enlargement.<sup>(7)</sup> They also reported that 50% of their melioidotic prostatic abscesses were multiseptated,<sup>(7)</sup> whereas Tan et al reported multiloculated abscesses in only 40% of cases.<sup>(6)</sup> In our case series, the melioidotic prostatic abscesses were usually multiple and more than 1 cm in size. They were located in either lobe of the prostate or involved both of the lobes. All appeared as a hypodense area with enhancing wall on CT. However, none of them were septated or multiloculated. The characteristics of prostatic abscess in our patients are summarised in Table II.

Conservative management with antimicrobial therapy alone is recommended for a small prostatic abscess that is less than 1.5 cm in diameter.<sup>(13)</sup> For larger abscesses, the treatment of choice is drainage in conjunction with antimicrobial therapy, as suggested by Liu et al.<sup>(9)</sup> In their retrospective review of 17 patients with prostatic abscesses caused by various organisms (e.g. *Klebsiella pneumoniae*, *Escherichia coli* and *Pseudomonas aeruginosa*), 14 patients had undergone surgical drainage of the prostatic abscess and three patients were treated

with antibiotics alone. Most of their patients recovered fully except for three patients who died of severe bacteraemia despite adequate drainage of the prostatic abscess.<sup>(9)</sup> Not all cases of melioidotic prostatic abscesses require surgical drainage, as shown by two case reports in which they were treated with antibiotics alone.<sup>(14,15)</sup> There has been no randomised controlled trial looking at the outcome of the treatment of melioidotic prostatic abscess in terms of mortality, with or without surgical drainage of the prostatic abscess. Therefore, surgical drainage of the melioidotic prostatic abscess is still controversial. On the other hand, surgical drainage of the prostatic abscess can incur a risk of urethral stricture, retrograde ejaculation and urinary incontinence.<sup>(12)</sup> Tan et al reported that of their five patients with melioidotic prostatic abscess who had undergone transurethral resection of the prostate (TURP), three patients had complications post-TURP (scrotal abscess, inadequate drainage requiring re-TURP and septic shock).<sup>(6)</sup>

In our study, all of our patients did not require surgical drainage and remained asymptomatic for prostatic abscess after treatment, except for one of our patients who died probably due to severe septicaemia. Currie et al found that four of their five patients with genitourinary melioidosis and septic shock died of the disease.<sup>(1)</sup> Our patient who died also had septic shock. Therefore, septic shock could be a risk factor for higher mortality in melioidotic prostatic abscess. Although melioidotic prostatic abscess is rare, it can result in severe complications, including pyelonephritis, perinephric abscess and scrotal abscess.<sup>(1,3)</sup> None of our patients had the complications associated with prostatic abscess. In conclusion, melioidotic prostatic abscess usually presents as part of the multiple organ involvement in melioidosis and CT is essential for its diagnosis.

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