➤ **Case Report** ➤

Tuberculous Mycotic Aneurysm of Common Iliac Artery Secondary from Ureteric Tuberculosis: The First Case Report and Review of the Literature

Patchara Paraksa, MD, Benjawan Skulsujirapa, MD, and Chusana Suankratay, MD, PhD

Extrapulmonary involvement of tuberculosis occurs in 10–40% of reported cases. However, tuberculous mycotic aneurysm is very rare. We report herein tuberculous mycotic aneurysm of left common iliac artery secondary from ureteric tuberculosis in a 63-year-old man who presented with left flank pain for 1 month, and review the literature of all reported cases of tuberculous aneurysm of iliac artery.

Keywords: tuberculous mycotic aneurysm, common iliac artery, ureteric tuberculosis

Introduction

Tuberculosis, an infectious disease with substantial morbidity and mortality, can cause a wide variety of clinical spectrum from acute to chronic and mild to fulminant course, and affect different organs. Tuberculosis mostly affects the lungs, but other organs can be involved. Most extrapulmonary tuberculosis are pleural and lymph node. Vascular and genitourinary involvement are very rare complications of tuberculosis. There are sparse reports tuberculous mycotic aneurysms of aorta in the literature,^{1,2} and even fewer of iliac artery.^{3–8} We report herein tuberculous mycotic aneurysm of left common iliac artery secondary from ureteric tuberculosis in a 63-year-old man who presented with left flank pain for 1 month, and review the literature of all reported cases of tuberculous aneurysm of iliac artery.

Division of Infectious Diseases, Department of Internal Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

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Corresponding author: Patchara Paraksa, MD. Division of Infectious Diseases, Department of Internal Medicine, King Chulalongkorn Memorial Hospital, 1873 Rama IV Rd., Pathumwan, Bangkok 10330, Thailand
Tel: +66-2-256-4578, Fax: +66-2-256-4578
E-mail: patcharaparaksa84@gmail.com

Case Report

A 63-year-old Thai male, living in Bangkok, with hypertension and old cerebrovascular accident presented with progressive left flank pain, radiating to the left lower quadrant of abdomen for 1 month. These symptoms were preceded by a 1-month course of low-grade fever, loss of appetite, fatigability, and weight loss of 9 kg. Further inquiry revealed no contact with tuberculosis. Physical examination revealed a body temperature of 38.4 degree celcius, fine crepitation at right lung, and left flank tenderness with negative psoas sign. A complete blood count analysis showed white blood cell count of 12,360 cells/ μ L (neutrophil 86%, lymphocyte 14%), a hemoglobin level of 12.7 g/dL, and a platelet count of 274,000 cells/ μ L. The serum level of C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) were 35 mg/L and 66 mm/hr respectively. Other routine blood chemistries were unremarkable. Urinalysis showed white blood cells of 5–10/high-power field (HPF) and red blood cells of 5–10/HPF. The HIV serology was non-reactive and chest radiogram revealed reticulonodular infiltration at right middle lung (RML) and right lower lung (RLL). Computed tomogram (CT) demonstrated multifocal irregular consolidations involving mainly superior segment of RLL and lateral segment of RML, large left iliac artery aneurysm, 6.4 $\times$ 6.4 $\times$ 5.7 cm, surrounded by inflammatory tissue, extending from the aortic bifurcation to left common iliac artery, and intravenous pyelogram (IVP) showing left ureterohydronephrosis due to tapered narrowing at the middle portion of the left ureter (Fig. 1). A bronchoscopy was performed, and bronchoalveolar lavage fluid culture and polymerase chain reaction (PCR) test were positive for *Mycobacterium tuberculosis* that was susceptible to all first-line antituberculous agents. Urine acid-fast bacilli was negative, but PCR test was positive for *M. tuberculosis* complex. Therefore, a final diagnosis of disseminated tuberculosis with pulmonary, left ureter, and left common iliac artery involvement was made. The treatment included the successful bypassing the ureteral obstruction with a ureteric double-J stent, endovascular aneurysm repair

(EVAR) of the terminal aortic bifurcation in continuity with the left common iliac artery, and a standard 6-month regimen of antituberculosis therapy (2 months of 300mg isoniazid, 450mg rifampin, 1,250mg pyrazinamide, and 1,000mg ethambutol daily and an additional 4 months of 300mg isoniazid and 600mg rifampin daily). The patient gradually improved and was discharged home 1 month after hospitalization and the 3-month follow-up CT revealed a decrease in the size of the left iliac artery

Fig. 1 Computed tomogram showing a large left common iliac artery aneurysm surrounded by inflammatory tissue and intravenous pyelogram showing left ureterohydronephrosis.

Fig. 2 Computed tomogram showing a decrease in the size of the left iliac artery aneurysm without evidence of hydronephrosis.

aneurysm, $3.3 \times 3.9 \times 4.1$ cm, without evidence of hydro-nephrosis (**Fig. 2**). He was doing well when last seen 6 months after treatment.

Discussion

Tuberculous mycotic aneurysm of common iliac artery is very rare, but potentially fatal. Long and colleagues²⁾ described the 3 possible mechanisms that the tubercle bacilli could reach the arterial wall: 1) the commonest was probably due to the direct extension from infected contiguous tissue including the paraarterial lymph nodes, lung, mediastinum, pleura, pericardium, vertebra, or paraspinal muscle, 2) the hematogenous dissemination from the distant infection site, and 3) the lymphangitic and venous spread from the infected regional lymph node and local organ. Most patients with tuberculous mycotic aneurysm present with sudden abdominal pain with and without hemodynamic shock due to the rupture or dissection of the aneurysm.⁹⁾ To date, there have been 6 patients with tuberculous mycotic aneurysm of common iliac artery (**Table 1**). The median age of these patients is 55 years (Interquartile range: 31.5–72.0 years). Three (50%) patients are male sex. The nationality of patients is South Korea, South Africa, Guinea, Japan, Negro, and the United States. The duration of illness ranges from 3 hours to 6 months. The aneurysm locates at the right site of common iliac artery in 5 (83%) patients. The most common associated tuberculosis at other sites is the lung and lymph node (3 patients each, 50%), followed by the pleura, pericardium, aorta, bone, peritoneum, liver, spleen, small bowel, and

Table 1 A summary of 6 reported cases of tuberculous mycotic aneurysm of common iliac artery

Case	Age (year)/sex	Nation/comorbidity	Clinical presentation/duration of illness	CIA aneurysm side	Associated TB at other sites	Surgery/medical treatment	Follow-up (months)/outcome
1 ³⁾	78/M	South Korea/ASO, TCC	Accidental finding during follow-up CT/unknown duration	Right	No	Debridement and drainage and EVAR/HRZE	5/improvement
2 ⁴⁾	12/F	South Africa/no	Abdominal pain for 3 weeks, and iliac fossa pain for few hours	Right	Descending AA	Resection, revascularization by aortofemoral bypass graft, HRZE	9/cure
3 ⁶⁾	38/M	Guinea/chronic viral hepatitis B	Fever for 6 months, and abdominal pain for 2 days	Right	Abdominal and mediastinal lymph node, lung, pericardial, bone and joint	Resection with ligature of CIA and reconstruction of aortic bifurcation/HRZE	6/cure
4 ⁵⁾	59/F	Japan/old pulmonary TB	Massive hematemesis and melena for 1 day	Right	Pleura, peritoneum, ileum	Extraanatomic bypass graft between left and right FA/no	2 days/death
5 ⁸⁾	51/M	Negro/CAD, CVA	Left flank and lower abdominal pain for 3 hours	Left	Lung, intraabdominal lymph node, left ureter	No/no	1day/death
6 ⁷⁾	70/F	US/none	Epigastrium pain for 5 months, and massive hematemesis and melena for 1 day	Right	Lung, bronchial lymph node, duodenum, liver, spleen	No/no	1 day/death

M: male; F: female; TB: tuberculosis; ASO: atherosclerosis obliterans; TCC: transitional cell carcinoma; CT: computed tomogram; CIA: common iliac artery; FA: femoral artery; EVAR: endovascular aneurysm repair; H: isoniazid; R: rifampin; Z: pyrazinamide; E: ethambutol; AA: abdominal aorta; CAD: coronary artery disease; CVA: cerebrovascular accident; US: the United States

ureter (1 patient each, 16.7%). Among 6 patients, 3 underwent curative surgery including aneurysm resection (2 patients) and fistulectomy (1 patient), 1 patient underwent EVAR, and 2 patients expired within few days due to the aneurysm rupture before making the definite diagnosis. Two patients cured with a range of follow-up of 6 to 9 months. One patient improved but lost to follow-up after 5 months of treatment. There are 3 in-hospital mortalities due to profound shock.

In our patient, we postulate that the tubercle bacilli from the lungs disseminated hematogenously from the lungs to the left kidney, were excreted in the urine and lodged to the distal ureter, and spread to the adjacent left common iliac artery causing the mycotic aneurysm. The ureterohydronephrosis demonstrated by the imagings is caused by the luminal obstruction, not from the extraluminal compression. In contrast, the previous case report showed that the ureteral obstruction was secondary from the rupture of the iliac aneurysm.⁸⁾

The clinical diagnosis of tuberculous mycotic aneurysm is very difficult; there should be the high index of suspicion when taking care of all patients presented with fever and sudden or unexplained abdominal or flank or back pain. Due to the advance in imaging technology, either CT or magnetic resonance angiogram is able to demonstrate the presence of aneurysm and complications of aorta and its branches. To date, there have been no randomized controlled study comparing the medical treatment with and without surgical intervention. However, most studies showed that all survived patients, besides from antituberculous treatment, underwent surgical intervention which includes aneurysm resection with in vascular graft, aneurysm exclusion with bypass graft, and EVAR.¹⁰⁾ Endovascular treatment with stent graft or coil can be proposed in patients at high risk for surgery or with a minimal amount of infected tissue. Our patient survived with both surgical and medical treatment.

Conclusion

We report the first case of tuberculous mycotic aneurysm of common iliac artery secondary from the ureteric tuberculosis, and review the English literature.

Disclosure Statement

All authors have no conflict of interest.

Author Contributions

Study conception: PP

Data collection: PP, BS

Analysis: PP, BS, CS

Investigation: PP, CS

Writing: PP, CS

Funding acquisition: PP

Critical review and revision: all authors

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