Cautionary Tale

Spreading sepsis by cystoscopy

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Summary: A healthy 54 year old man was investigated for haematuria. In spite of a proven urinary tract infection a cystoscopy was carried out with no antibiotic therapy. As a result he developed systemic infection leading to two independent, and potentially fatal, complications: vertebral osteomyelitis and a mycotic false aneurysm.

Introduction

Cystoscopy is a recognized cause of systemic infection. We present a case of two potentially life-threatening complications arising in quick succession following routine cystoscopy, which was performed, without antibiotic cover, in a patient with a urinary tract infection.

Case report

A previously healthy 54 year old driving instructor presented with a 5-day history of terminal haematuria, dysuria and 'flu-like' illness. He was referred by his general practitioner to another unit where he was seen after his symptoms had resolved. Coliform bacteria were grown from a mid-stream specimen of urine (MSU), and an intravenous urogram showed oedematous bladder mucosa consistent with infection and no other abnormality. No antibiotics were prescribed despite the evidence of infection. A cystoscopy was performed approximately one month after the initial presentation. Bladder biopsy was consistent with infection and showed no dysplasia. A routine follow-up cystoscopy was arranged for 4 months later.

On the evening of the cystoscopy the patient developed a high temperature and rigors lasting 7 days followed by a gradual onset of thoracic back pain. He presented to our outpatient department 3 weeks later. Initial investigations included an alkaline phosphatase of 408 U/l (normal range), ESR 56 mm/h, white cell count $13.0 \times 10^9/l$. Chest and thoracic spine X-rays were reported as normal. An abdominal ultrasound was normal but a bone

scan showed increased uptake in the spine at the level of T8/T9, consistent with an acute discitis. By this stage the patient had developed rigors again and he was admitted to hospital.

Ampicillin and gentamicin were commenced while awaiting the results of MSU and blood cultures. Urine culture showed no growth but *E. coli*, sensitive to cotrimoxazole, were grown from the blood. His symptoms settled and he was discharged after 8 days with a 6-week course of antibiotics.

One week later he was seen again in outpatient's complaining of malaise, anorexia and a painful left hip. On examination he was pyrexial and looked very unwell. In addition he was noted to have bruising and tenderness in the left groin and painful hip extension. In spite of the high level of the discitis a provisional diagnosis of psoas abscess was made.

Abdominal ultrasound revealed a cystic lesion in the left iliac fossa producing hydronephrosis by pressure on the ureter (no direct connection was seen on IVU). Needle aspiration was attempted under ultrasonic guidance but on 3 consecutive attempts only pulsatile blood was obtained. A computed tomographic scan was then performed which confirmed the presence of an aneurysm (Figure 1). A transfemoral arteriogram further defined the lesion as a large, probably false, aneurysm of the left common iliac artery.

A femoro-femoral cross-over graft was performed and the aneurysm was excluded from the circulation. Histological examination was consistent with a false aneurysm; the presence of a dense neutrophilic infiltrate was suggestive of a septic origin. Gram staining and culture of the specimen failed to identify any organism but by this time the patient had been on antibiotics for 3 weeks. A good post-operative recovery was made and the patient

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Figure 1 CT scan of the abdomen, showing a false aneurysm of the left common iliac artery.

was discharged in good health on a 6-week course of broad spectrum antibiotics.

Comment

By the early years of the nineteenth century it was recognized that urethral catheterization might be followed by fever and rigors. This was subsequently established as being due to bacteraemia initiated by instrumentation of the urinary tract.¹ There is evidence that the major source of organisms causing bacteraemia is pre-existing urinary infection and that the risk of systemic sepsis is greater in more traumatic procedures such as transurethral resection of the prostate or urethral dilatation rather than simple cystoscopy or catheterization.¹⁻³

Discitis, or vertebral osteomyelitis, is a pyogenic infection of the disc and adjacent vertebral bodies presenting with features of systemic infection

associated with back pain at any level. It most typically presents in older males often with a time course greater than 3 months. Epidural abscess formation leading to paraplegia is its most feared complication. In 25% of cases *E. coli* is the causative organism and this is a well recognized complication of both urinary tract infection and cystoscopy.^{4,5}

Iliac artery false aneurysms are commonly associated with aorto-iliac prosthetic grafts or surgical trauma but in the antibiotic era the incidence of mycotic aneurysms has been very low,⁶ most cases still being associated with embolization of vegetations from bacterial endocarditis.⁷ In those rare instances where bacteraemia causes mycotic aneurysms to occur in previously normal arteries, this is probably due to localization of the bacteria in the vasa vasora of the arterial wall.⁶ The risk of rupture necessitates urgent surgery, with reconstruction through an uninfected field and exclusion of the infected aneurysm from the circulation.^{7,8}

It is our view that the original instrumentation of the urinary tract in the presence of infection, and without antibiotic cover, led to a systemic infection which produced both vertebral osteomyelitis and an infection of the wall of the common iliac artery bifurcation resulting in the formation of a false aneurysm. The relative importance in the promotion of systemic sepsis of the cystoscopy itself and the bladder biopsy taken at the same time remains uncertain.

The implication of the events described is that before cystoscopy is undertaken if there is any doubt concerning the sterility of the urinary tract then antibiotics should be given to prevent systemic spread.

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