Pyonephrosis



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MEDICAL

Pyonephrosis

Clinical History

A 38-year old female presents with severe nausea, vomiting, fevers and rigors. She has a history of recurrent urinary tract infection over the past 6 months. She has required several courses of oral antibiotics, and one admission for IV antibiotics. Blood tests show raised inflammatory markers. Urinalysis is positive for white blood cells (WBC). A CT scan shows unilateral left hydronephrosis and pyelonephritis. She fails to respond to conservative treatment, and undergoes a nephrectomy. She makes a complete recovery.



Pathology

This is the patient's left nephrectomy specimen. The kidney has been sliced to display the cut surface. The pelvis and calyces are greatly dilated, and contain remnants of yellow pus. There is considerable fibrosis of the renal parenchyma. In the mid-zone near the lateral border, there is a hemorrhagic necrotic area 35 x 12 mm in diameter containing pus. There are two similar small hemorrhagic necrotic areas visible on the capsular surface. These lesions are probably continuous with the lesion seen on the cut surface, likely to be caused by haemorrhage into an abscess cavity. This lesion would have resulted in a perinephric abscess.



Further Information

Pyonephrosis occurs when there is an obstruction within the upper urinary tract and pyelonephritis. Debris of infection, WBC and bacteria collect in the obstructed kidney, resulting in a hydronephrotic kidney that is filled with pus. A staghorn calculus usually forms in association with chronic or recurrent infection as a consequence of the more alkaline urinary pH caused by the bacterial infection.

Pyonephrosis is a rare condition. Risk factors for development include immunosuppression, diabetes and anatomical urinary tract obstructions e.g. urinary tract strictures, horseshoe kidneys, tumours, urinary calculi. Clinical presentation can consist of vague symptoms but may include constitutional symptoms of sepsis, flank pain, haematuria, dysuria and pyuria. A grossly nephrotic kidney may be palpable on palpation of the abdomen. Pyuria will be present on urinalysis. Radiological diagnosis can be made using CT investigations usually but also Ultrasound or MRI looking for evidence of urinary tract obstruction and pyelonephritis.

Treatment will depend on the cause of the obstructing lesion. Emergent treatment involves drainage of the purulent build up within the kidney. This is performed by urology or interventional radiologists via percutaneous or retrograde ureteral stents to relieve the obstruction and drain the pus. Further surgical treatment will depend on the cause of obstruction. Antibiotic therapy is required for treatment of underlying infection or sepsis. If left untreated complications such as florid sepsis, xanthogranulomatous pyelonephritis, renal or perinephric abscess formation or fistula to pleura, colon or duodenum may occur.



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