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Chronic pyonephrosis associated with renal neovascularisation.

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Summary

The spectrum of renal tract infections is wide. When the kidney has been severely damaged, the radiological findings may suggest a malignancy. To report a case of chronic pyonephrosis, which even at exploration appeared to be a malignancy. The case record of the patient as well as the literature were reviewed and reported. A 25 year-old woman presented with a 5-year history of left lumbar pain, urinary frequency and intermittent total haematuria. The intravenous urography showed non-function in the left kidney harbouring a calculus. Treatment was delayed for poor finances. At laparotomy a huge renal mass invading the colonic mesentery and showing neovascularisation was removed. The final diagnosis was chronic pyonephrosis. She recovered from postoperative septicaemia. Neovascularisation is a feature of malignant disease mediated by angiogenesis factors. These factors are probably present in chronic inflammation. It is suggested that for nephrectomy, prophylactic antibiotics should be used. There is also a need for histopathological examination of every specimen removed at operation.

Keywords: *Chronic pyonephrosis; neovascularisation; mesenteric invasion*

Résumé

Le spectre des infections de la voie renale est grandement lorsque les reins ont été severement affectés. Les données radiologiques peuvent suggérer une maligne. Pour rapporter ce cas chronique de pyonéphrosie qui, à l'exploration apparait maligne chez une femme de 25 ans avec une histoire de 5 ans de douleur lumbaire gauche, urine fréquemment et d'hématurie intermittent totale. L'urographie intraveneux montrait sans function du rien droit au calculus. Le traitement etait retardé a cause des problémes financiers. La laparomie d'une masse rénale qui envahit la mésenterie colonique et montrait une néovascularisation était enlevée.Le diagnostie finale d'une pyonéphrosie chronique. Elle recouvert d'une sépticemie postoperative. La néovascularisation est une charactéristique de la maladie maligne médiée par les facteurs d'angiogénese Ces facteurs sont problablement présent en inflammation chronique. Il est suggéré que pour la néphrectomie, d'antibiotiques prophylatique doivent etre prise. Il y a une besion d'une examination histopathologique de chaque specimen enleve pendant la chirugie.

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Introduction

Infections occurring in the urinary tract vary and the spectrum includes pyonephrosis. Pyonephrosis in which pus accumulates in the renal pelvis occurs in a severely infected and obstructed kidney [1]. The micro-organisms responsible for pyonephrosis include both aerobic and anaerobic organisms [2]. The presentation may be acute or chronic [3]. The affected kidney may be destroyed significantly to lose function. A 25-year-old woman with chronic pyonephrosis of the left kidney is presented.

Case report

A 25-year old lady presented with intermittent colicky left lumbar pain of 5 years duration. She subsequently developed dysuria and urinary frequency associated with urgency. She also had total haematuria for three months prior to presentation. She had lost weight and was lethargic. She was pale with a pulse rate of 72 per minute and a blood pressure of 110/70 mmHg. There was a ballotable tender left flank mass extending from the left hypochondrium to the left iliac fossa. Urinalysis revealed numerous pus and red blood cells. The urine culture yielded a heavy growth of *Klebsiella* species sensitive to ofloxacin. The electrolytes, urea and creatinine were within normal limits. The chest radiograph was normal. An intravenous urography (IVU) showed a calculus in an inferiorly displaced non-functioning left kidney. The right kidney appeared normal. An ultrasound scan (USS) revealed an enlarged left kidney with gross calyceal dilatation. The haemoglobin concentration was 7 gm/dl and the ESR was 100mm in the 1st hour Westergreen. The white blood cell count (WBC) was 3.6 x 10^9/mL (Neutrophils 28% and Lymphocytes 72%). The presumed diagnosis was left renal carcinoma associated with a renal calculus complicated by urinary tract infection. She was commenced on ofloxacin 500 mg twice daily. She declined a left nephrectomy for financial reasons.

She presented again, eight months later, as an emergency with anorexia in addition to her earlier symptoms. She was still pale and the abdominal mass had increased in size. Her pulse rate was 80/min with a blood pressure of 120/80 mm Hg. The haemoglobin concentration at this time was 7.7 gm/dl. Urinalysis still showed numerous pus and red blood cells. The electrolytes, urea and creatinine were normal. She was transfused 2 units of blood. An exploratory laparatomy was done. There was a huge left renal mass invading the colonic mesentery and showing neovascularization. A huge calculus was found in the renal pelvis. The ureter was dilated and showed surrounding

fibrosis. The left kidney and ureter were removed. In the course of mobilising the mass, it ruptured and spilled pus. She received 2 units of blood intraoperatively.

On the second post-operative day, she developed fever and was jaundiced and pale. The liver was now enlarged and tender. She also had a tender splenomegaly. A clinical diagnosis of septicaemia was made. She was commenced on intravenous cefuroxime, gentamicin and metronidazole. A repeat full blood count (FBC) showed a haemoglobin concentration of 5.7 gm/dl, a WBC of 6.1 x 10^9/ml (Neutrophils 84% and Lymphocyte 16%). The liver function tests showed total bilirubin 228 umol/L, conjugated bilirubin 91 umol/L, alkaline phosphatase 25 umol/L and serum albumin 32 g/L. The hepatitis B antigen and HIV tests were negative. Urinalysis showed numerous pus cells per high power field but the urine culture yielded no growth. Culture of the pus from the kidneys yielded a heavy growth of *Klebsiella* species. The temperature subsided and by the 6th postoperative day the splenomegaly regressed, but the hepatomegaly persisted. The jaundice cleared by the 9th post-operative day. The ureter on histopathological examination contained calculi. There was no renal malignancy and the diagnosis was chronic pyonephrosis.

She subsequently recovered and was discharged home on the 11th post-operative day. A follow-up ultrasound scan at 6 months showed compensatory hypertrophy of the right kidney.

Discussion

Several reports have shown that pyonephrosis can be caused by varied pathologies ranging from congenital abnormalities to calculi [4] and tumours [5]. Obstruction of the renal tract is the common means of these lesions to cause pyonephrosis [1]. Parasites have also been reported to cause pyonephrosis [2,6]. The cause in the above patient is presumably the calculus resulting in obstructive uropathy. *Klebsiella* species are among the commonest pathogens in urinary tract infection [2,7].

Patients with pyonephrosis may present in the acute or chronic phase [3]. Our patient had intermittent left lumbar pain for 5 years before presentation. St Lezin *et al* reported the absence of flank pain and fever in a number of their patients with pyonephrosis [4]. The presence of haematuria and a ballotable left kidney led to a strong suspicion of renal cell carcinoma.

The full blood count at the first presentation showed a low white cell count. Absence of leukocytosis in pyonephrosis has been reported previously [4]. The IVU and ultrasound scan findings are in keeping with those reported for renal infections as has been published by others [8,9]. The diagnosis of pyonephrosis may be difficult in spite of recent radiological facilities such as USS [4,10]. Other sophisticated facilities are magnetic resonance imaging (MRI), computerised tomography (CT) scan and renal angiography but are too costly for the average Nigerian. The urine culture grew *Klebsiella* species, which was also cultured from the pus. This is an aerobic organism. In their series Apostolopoulou *et al* [2] recovered the same organism from 20 of their 22 patients, although the most often isolated organisms were *Proteus mirabilis* and *Escherichia coli*. The organisms in chronic pyonephrosis may be multiple [4].

The suspicion of renal malignancy was reinforced by the operative finding of renal neovascularisation and invasion of the mesentery. Neovascularisation is thought to be mediated by angiogenic factors, soluble proteins found in patients with solid malignant diseases [11]. On the basis of the above suspicion, the patient was subjected to a radical left nephrectomy. In spite of the spilled pus, renal cell carcinoma was still suspected as it can occur in conjunction with pyonephrosis [5]. It is speculated that in these circumstances, the renal infection is secondary to the carcinoma as this could have caused obstruction and urinary stasis. However, the final diagnosis from histopathology was pyonephrosis. The preferred treatment of pyonephrosis is drainage and use of potent antibiotics [4,12,13]. Nephrectomy may be done for such complications of pyonephrosis as intraperitoneal rupture [14,15], irreversible renal damage [1] and systemic amyloidosis [16].

The above case confirms that angiogenesis can occur in chronic inflammation as has been documented earlier [17]. It also reinforces the need to subject all specimens to histological analysis as well as the need to employ prophylactic antibiotics in all patients for nephrectomy.

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