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RESEARCH ARTICLE

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Pyonephrose: Risk factors, clinical, para-clinical and anatomopathological profile about 19 cases

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Summary

Introduction:
Ponephrosis is a severe infection which is defined by the destruction of the renal parenchyma by a suppurative process within the dilated pyelocaliceal cavities. Suspected clinically but his diagnosis is mainly based on imagery. Despite clinical and radiological knowledge, it remains a surprise for the surgeon. The objective of this work is to describe the risk factors, the clinical, paraclinical and histological profile of it.

Patients And Methods:
We report a retrospective uni-centric study conducted from 02/2018 to 02/17/2020 including all the patients meeting the definition criteria. The data collected on pre-established cards were: age, risk factors, symptomatology, clinical examination data, para-clinical and anato-mopathological examination results

Results:
Nineteen cases were listed, including 11 men and 08 women (M / F ratio at 1.37). The average age at diagnosis was 40 years (25-75 years). Urolithiasis was the most represented risk factor with 68.4% of the patients (Table 1). Low back pain was the most frequent reason for consultation (52.6%), infectious syndrome in 42.5% of cases. The clinical examination found lumbar contact in 63.1% of cases and a fistula in two cases. In 57.8% of patients, urine culture and pus samples had isolated a germ. Kidney function was impaired in 21% of patients. Ultrasound was diagnosed in 11 cases, but CT confirmed in all cases (Figure 1).

All patients were treated with antibiotic therapy followed by subcapsular nephrectomy in 15 cases. Complicated post-operative infection in 5.2% of cases; chronic non-specific pyelonephritis was the most common form in 74% of cases

Conclusion: Urolithiasis, obstruction of the upper apparatus and diabetes are the main factors involved. The Euro-scanner plays a crucial role in the diagnosis. Drainage of the excretory pathway completed with cold nephrectomy gives good results. Non-specific chronic pyelonephritis is the most common histological form.

Key words: Pyonephrosis, risk factors, clinical profile, para-clinical and anatomopathological.

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1 | INTRODUCTION

Pyonephrosis is a severe kidney disease defined by the renal parenchyma's destruction by a suppurative process within the dilated pyelo-calicial cavities (1). It can be suspected clinically but its diagnosis is based on imaging. Despite current clinical and radiological knowledge, it remains a mystery for surgeons (1). The objective of this work is to describe the risk factors as well as the clinical, paraclinical, and histopathological profile of this condition.

2 | MATERIALS AND METHODS

We carried out a descriptive cross-sectional study with retrospective mono-centric data collection carried out from February 2016 to February 2020. This involved a study of the files of patients hospitalized in the urology department of the Ibn Rochd university hospital centerin Casablanca Morocco. All patients who meet the criteria of the definition and who have undergone nephrectomy were included in the present study. After obtaining the agreement of the ethics committee, the data collected on pre-established forms were: age, sex, risk factors, symptoms, clinical and paraclinical examination data as well as the results of anatomy, pathological examination, and evolution. Incomplete files were excluded. All patients had received a renal ultrasound on admission, supplemented by a CT scan (Figure 1).

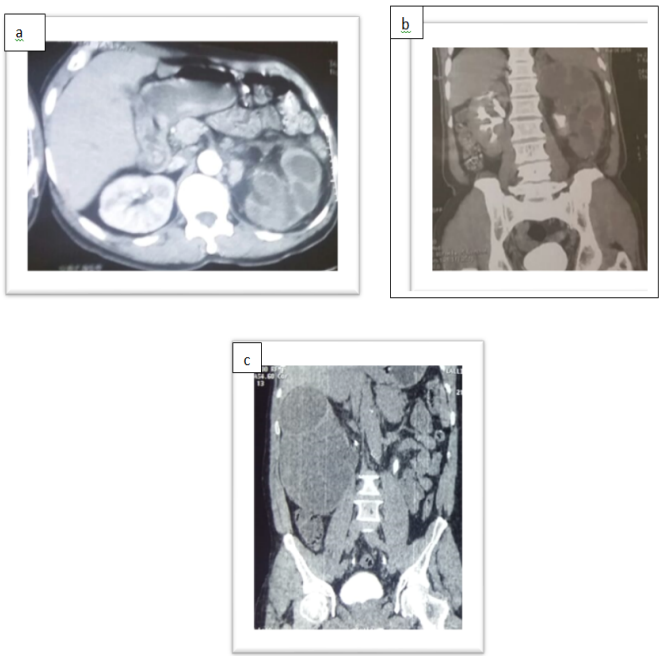

FIGURE 1: FIGURE 1 Uro-CT of pyonephrosis with Bear'spaw images (a) Axial section, (b) and (c) Coronal reconstruction

All the patients undergo conventional lumbotomy with or without rib resection. The decision to un-dergo capsular nephrectomy was made based on in-traoperative findings (adhesions, infiltration of per-ineal fat). The surgical specimen (Figure 2) was stored in formalin and then sent for pathological examination. The processing and analysis of the files were done using Excel 2016 software.

FIGURE 2: Surgicalspecimen of a pyonephrosis

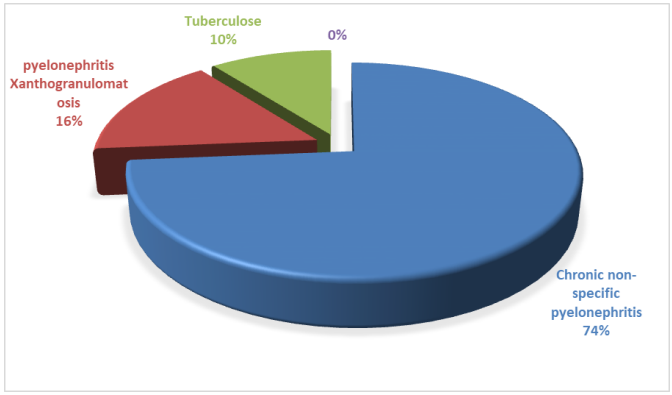

FIGURE 3:

3 | RESULTS

We consulted 16,512 files of which 25 patients (0.0015) had pyonephrosis. Only the files of patients who had undergone a nephrectomy were retained, including nineteen patients 11 men and 08 women with a male / female ratio of 1.37. The six patients who received conservative treatment were excluded from our work. The mean age at diagnosis was 40 years with the extremes of 25 and 75 years. Urolithiasis was the most represented risk factor with 68.4% (13 cases) (Table 1).

Table 1 : Risk factors of pyonephrosis

Risk factors	Number	Frequency
Obstructive urinary lithiasis	13	68,4%
Diabetes	6	31,5%
Pyeloureteral junction syndrome (PUJ)	2	10,6%

Low back pain was the most frequent reason for consultation, 52.6% (10 cases), the infectious syndrome was present in 42.5% (8 cases). Clinical examination found lumbar contact in 63.1% (12 patients) and fistula in two cases (10.5%). In 57.8% (11 patients) urine culture and pus samples isolated one germ and it was the E. coli. Renal function was disturbed in 21% (4 cases). Ultrasonography was the best investigation in 11 cases (57.8%) but the CT scan confirmed it in all cases, often showing the image of the bear paw. Management consisted of bi-antibiotic therapy for all patients, urinary diversion by percutaneous nephrostomy in 68.4% (13 cases), and sub-capsular nephrectomy in 15 cases (79%). Postoperative consequences were complicated by wall infection in 5.2% (1 case). Chronic non-specific pyelonephritis was the most frequent histopathological form, 74% (14 cases) (graph1).

4 | DISCUSSION

Pyonephrosis affects all ages with a predominance in young adults. The average age at diagnosis for our patients was 40 years. Lezin (2) in a series of 23 cases and Mosbah (3) in a series of 36 cases reported an average age of 52.5 years and 41 years, respectively. It affects both sexes with a female predominance (3). But in our study, we found a male predominance with a sex ratio of 1.37. Dassouli (4) also reported male predominance with a sex ratio of 1.62. Many factors favor the onset of pyonephrosis: Urinary tract infection, chronic obstruction, and stasis often of lithiasis, malformation, or tumor origin (5) (6). In our context, urolithiasis was the most represented risk factor in 68.4%, this could explain this male predominance. Pyonephrosis may be the revealing mode of urogenital tuberculosis (7). Sow Y (8) reported cases of ureterovesical stenosis of bilharzial origin as an etiological factor, especially in areas endemic for bilharzia. The clinical profile of pyonephrosis is variable. For our study, low back pain and the infectious syndrome were the most common association found in consultation, as reported in the literature by some authors (3).Sometimes the patient may present with a picture of sepsis (9). Pyonephrosis can be neglected and only diagnosed at the stage of complications with the occurrence of reno-cutaneous (10), reno-colic, or reno-bronchial fistula. We found two cases (10.5%) of reno-cutaneous fistula. Lumbar contact was frequently found (63.1%) in our study as reported in the results (11). The inflammatory syndrome has been associated with leukocytosis (12) (13). According to Wu et al (14), a high C reactive protein (CRP) and an accelerated red blood cell sedimentation rate (ESR) can allow the detection of pyonephrosis in 97% of cases. Kidney function generally remains normal when the contralateral kidney is functional. If

Supplementary information The online version of this article (https://doi.org/10.52845/JMRHS/2022-5-2-1) contains supplementary material, which is available to authorized users.

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the affected kidney has lost all of its functional value, nephrectomy was often recommended (15). Urine cytobacteriological examination (ECBU) may show significant pyuria, bacteriuria, and leukocyturia. It also allows the identification of the germ and the performance of an antibiogram (5). The analysis of the pus sample obtained during the nephrostomy is much more sensitive (8). Gram-negative bacteria were the most implicated in urinary tract infections including pyonephrosis (16). CT scans and pus samples from nephrectomies identified gram-negative bacilli and E. colias the most frequently isolated germ. Our series found four patients (21%) with impaired overall renal function at the time of diagnosis. This deterioration has been linked mainly to the infectious picture and dehydration.

In terms of imaging, renal ultrasound as the first examination to be performed revealed 11 cases (57.8%) of pyonephrosis in our series. A prospective study by Subramanyam (17) had shown that ultrasound has a sensitivity of 90%, a specificity of 9,7%, and an accuracy of 96% in differentiating pyonephrosis from simple hydronephrosis. For Y. Diallo (18), ultrasound had suspected the diagnosis of pyonephrosis in 16 patients, or 84.1% in his series of 19 cases. Renal ultrasound can also help establish a diagnostic etiology of pyonephrosis and to some extent clarify the perirenal extent of the infection (19). Computed tomography (CT) assesses the thickness of the renal parenchyma, which is much reduced compared to the dilated cavities that are the site of hyperdense signals (5) (19). This test better identifies the nature of the obstruction, kidney function, the severity of the condition, and perirenal inflammation (6). For our study, the CT scan confirmed the diagnosis of pyonephrosis in all 19 patients.

The treatment of pyonephrosis is surgical. It is supervised by a bi-antibiotic therapy, rehydration, and drainage often by percutaneous nephrostomy in emergency and waiting to operate under the right conditions. This surgical treatment consists of a lumbotomy nephrectomy as the first approach to avoid septic contamination of the peritoneal cavity (20). In our series, all the patients received bi-antibiotic therapy which was subsequently adapted to the antibiogram. The urgent and waiting urinary diversion was performed by percutaneous nephrostomy in 68.4% of cases. Sub-capsular nephrectomy decided upon intraoperatively was performed in 15 patients (79%). When simple nephrectomy is deemed difficult due to inflammation and perirenal adhesions during surgery, subcapsular nephrectomy is performed (20). Lezin et al (2) out of a series of 23 cases performed prior nephrostomy in all patients, of which 21.7% underwent nephrectomy and 78.3% conservative treatment. The nephrectomy was performed in our context in front of a destroyed kidney and renal scintigraphy with DMSA below 10%. Complications during and after surgery are possible (bleeding, lesion of neighboring organs, fistula).In the long term, the most serious complication, even if it is rare, is squamous cell carcinoma of the excretory tract, the prognosis of which is poor with an average survival of 5 months (21).For our study, the postoperative consequences were complicated by infection of the wall in 5.2%. From an anatomopathological point of view, we often find a large kidney surrounded by adherent and sclerotic tissue with a section of parenchyma destroyed by cavities filled with purulent fluid. Presence of interstitial nephritis lesions associated with micro-abscesses on microscopy. The excretory pathway is often the site of inflammation with destruction of the muscle layer which is replaced by sclerosis (22). For our study, chronic non-specific pyelonephritis was the most frequent histopathological form 74% (14 cases). Three cases of xanthogranulomatous pyelonephritis were confirmed by pathological examination of the surgical specimen. Urogenital tuberculosis was found in two cases (9.5%). We did not find any tumor pathology. The retrospective nature of the data was the limitation of our study. But despite this, the goal of our work was achieved.

5 | CONCLUSION

Pyonephrosis is a diagnostic and therapeutic emergency. Nephrectomy remains the standard treatment in the event of a completely destroyed kidney. The best solution is to prevent, diagnose and treat early lithiasis, which can lead to the destruction of the kidney. Chronic nonspecific pyelonephritis was the most common histopathologic form.

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