ABSTRACT

Introduction. The authors studied a series of 124 cases of pyonephrosis, which had been diagnosed and surgically treated in our department over these 10 years, representing 1% of all urological cases. We considered as pyonephrosis that cases where suppurative injury of renal parenchyma, together with distruction of intrarenal collecting system, was hystologically proved, none of them being of bacilar etiology.

Material and method. In the postoperative surveillance period, 8 cases from all of these 124, developed postoperative complications and 2 pacients deceased. The diagnostic was clinically suspected, sustained by blood tests, bacteriological stains and imagistic methods (ultrasonography, intravenous pyelography and computer tomography when needed) and was surgically confirmed.

The treatment. Surgery was performed in order to remove the purulence, medical treatment being focused on antimicrobial cure, maintenance of acid-basic balance, prevention of embolic events and hyperazotemia. Depending on the evolution stage of pyonephrosis and on associated diseases, we noticed 8 postoperative complications and 2 succumbs.

Conclusions. Pyonephrosis, a lifethreatening condition, is a real diagnostic and treatment emergency. Gradated selection of diagnostic procedures and medical/surgical treatment methods, will be considered referring to disease evolution stage, contralateral kidney function and other pacient’s complaints.

Key words: kidney-suppurative renal injury-“vital risk”
Diagnosticul – a fost suspicionat clinic ; confirmat prin examene de laborator – examen bacteriologic şi imagistic ( ecografie, UIV +/- CT ) şi certificat intraoperator.

Tratamentul – A vizat asanarea focarului septic (CHIRURGICAL), simultan cu tratamentul antiinfecţios, de reechilibrare a dezechilibrelor hidroelectrolitice, bioumorale, combaterea hiperazotemiei, tratamentul tarelor asociate şi combaterea riscului embolic (MEDICAL).

În funcţie de stadiul evolutiv al pionefrozei si de tarele asociate am înregistrat 8 complicaţii postoperatorii şi 2 decese.

CONCLUZII - Pionefroza – afecţiune gravă cu risc vital, este urgenţă de diagnostic şi tratament ; - Ierarhizarea investigaţiilor de diagnostic şi nuanţarea tratamentului medico-chirurgical se vor efectua în funcţie de stadiul evolutiv al bolii, starea rinichiului controlateral şi de tarele asociate.

CUVINTE CHEIE: Rinichi, distructie supurativă, risc vital

**Purpose.** The aim of this study is to emphasize those practical conclusions for ierarhization of diagnostic methods and treatment procedures of pyonephrosis.

**Material and method.** In our department, a yearly average number of 124 cases of pyonephrosis was reported, with a peak of incidence in elderly, 7th decade (42 cases – figure 1), with a slight female preponderence (71 women over 53 males) and with a slight predominance of the right kidney occurrence (62 cases, over 59 cases on the left kidney). The great majority of cases was on normal located kidney (118 cases), 3 cases being on horseshoe kidney and other 3, on iliac ectopy (figure 2).
We treated 78 cases of lithiasic pyonephrosis, wherefrom 35 cases had multiple stones, 25 cases had unique stone, 10 cases had staghorn calculus, 5 cases had bilateral stones and 3 cases had branched stone.

We encountered 46 cases of stone-free pyonephrosis, werefrom 29 were associated with renal hydronephrosis and 17 cases coexisted with pyelonephritis (figure 3).

Concerning the local evolutive stage, we registered: 106 cases of pyonephrosis featuring no evidence of renal capsule discontinuity (63 lithiasic cases, 43 stone free-cases) and 18 "broken" pyonephrosis; the latest series included 11 lithiasic cases, 2 cutaneous fistulous tract and 1 case with ileal fistulous tract; 7 cases were stone-free pyonephrosis.
Clinical abnormalities

- most cases were admitted with common symptoms 92 patients presenting previously chronic urologic complaints, with exacerbation of unilateral flank pain, fever, chills, featuring a large palpable kidney, purulent urine and malaise.

- gastrointestinal forms: 18 cases of “broken” pyonephrosis, 3 cases of pyonephrosis on iliac ectopy and 3 cases of pyonephrosis on horseshoe kidney, featured clinical signs of peritoneal irritation

- septic forms: in 7 cases urosepsis dominated the clinical picture-fever, chills, pale skin, general ill feeling, pyuria and unregulated lumbar pain

- decompensated renal failure forms (8 cases) – the clinical status was generated by hyperazotemia, oliguria, nausea, vomiting, dry skin, itching and confusion .(figure 4)

Bacteriological exams

- uroculture, with associated antibiogram, showed:
  - Gram negative agents, in the majority of cases, in the following decreasing order of incidence: E.Coli, Klebsiella, Proteus.
• sterile urine culture - 26 cases with complete ureteropyelic junction (UPJ) obstruction which induced pyonephrosis (figure 5)

![Pie chart showing number of positive and negative uroculture](image)

Fig. 5 NUMBER OF POSITIVE AND NEGATIVE UROCULTURE

- hemoculture, rarely yielded (during chills), was positive in 1/7 of cases

**Blood tests**

We noticed the predominance of hyperleucocitosis, anemia, hypernitrogenemia.

**Imaging diagnostic procedures**

In order of their performance, they were:

- **ultrasound** findings: large kidney with or without disruption of the renal capsule, with hydronephrosis and narrowing of renal parenchyma, with echogenic foci, with or without calculi

- **intravenous urography**: absence of the affected kidney's function, inhomogenous opacified collecting system, with/without renal stones, nephromegaly with/without a distinct delineation of the renal outline

- **computed tomography scanning**: is extremely helpful in diagnosing pyonephrosis, showing kidney enlargement with variable density foci in parenchyma, with/without regulate capsule contour, with/without renal stones which are not observed on the ultrasonogram; advantages of CT scanning include correct localization of the kidney and correct assessment of vascular involvement and surrounding structures' invasion (figure 6 a,b,c)
After a readily establishment of the diagnosis of pyonephrosis, we performed, for all our patients, the most appropriate and complex treatment (medical & surgical), according to the stage of the disease, to the status of the contralateral kidney and to the associated disorders.

**Therapy**

**Medical therapy:** it was onset prior to surgery, continued during the postoperative period and consisted on:
- bactericid treatment – combination of wide spectrum antibiotics (aminoglycosides, cephalosporines or other β-lactamines and chinolones); it was correctly dosed and interspaced.
- control and adjustment of red blood cells, acid-basic balance, hyperazotemia
- treatment of other associated disorders (diabetes, heart and pulmonary failure), that was performed for all the cases which needed it.
- prevention of blood clots formation, using heparine with low-weighted molecule (Clexane, Inohep)

Surgical therapy was the mainstay of treatment and its purpose was to eradicate the renal purulence; it was differentiated in conformity with the stage of pyonephrosis, the condition of the contralateral kidney and the severity of the added illnesses:

- in the majority of our cases we advocated the lumbar incision followed by nephrectomy of pyonephrotic kidney and excision of the ipsilateral perirenal tissue.
- 8 cases, with large pyonephrotic kidney and peritoneal or musculoaponevrosis adherences, required cleavage nephrectomy, in a “morcellation” manner.
- for 5 patients with nephromegaly, suppurative perinephritis and multiple adherences to psoas muscle and to the peritoneum, we performed initially nephrostomy with Pezzer sonde in order to drainage the purulent content for 7-10 days, and nephrectomy was done in the second step.
- we decided pyelovesical drainage and autostatic ureterovesical catheterisation for 4-5 days, followed by nephrectomy, for all the patients with pyonephrosis on a hydronephrotic kidney, with achalasia of pyelouretheral junction and with bad clinical status.
- in 5 cases we performed initial pyelovesical drainage, using a Cook sonde in the contralateral hydronephrotic or lithiasic kidney, followed by nephrectomy of pyonephrotic kidney
- 9 cases with high value of azotemia and with damaged contralateral kidney, required 2-5 postoperative dialysis sessions and only 3 cases required 1-2 dialysis sessions prior to surgery; simultaneously, in 1 case of “broken” pyonephrosis, the fistulous tract was resolved by lumbar incision.
- in 1 case with lithiasic pyonephrosis on right horseshoe kidney, which also fistulised in ileon, we performed transperitoneal nephrectomy; one of our surgeon colleagues realised a segmentary resection of 30 cm of ileon, followed by a termino-terminal anastomosis; this case ended into spectacular postoperative result, which was assessed by clinical and imagistic methods (barium enema, i.v. pyelography). The patient was discharged after 21 days of admission, with good intestinal transit and normal renal function (figure).
As a rule, we closed the wound, using resorbable threads, in 1-2 layers and we inserted 1-2 drainage tubes in a contraincisional lesion.

In cases with horseshoe kidney we used the pararectal transperitoneal way and, in iliac ectopic kidney, we performed retroperitoneal abord, using an ileoinguinal incision.

The postoperative evolution

It was favorable for the majority of our series patients. We encountered 8 cases of various types of complications:

- 5 cases – parietal suppuration, between the 3rd – 7th day postsurgery.
We reincised the lumbar region and performed the debris lavage using antiseptical solutions, we added new drainage tubes and we suplimented antibacterial treatment.

- 2 cases – minimal basal pleuresis, between the 4th–7th postsurgery. This complication disappeared after antimicrobial and antinflammatory drugs, and after patient mobilisation.
- 1 case of left pelvin thrombophlebitis, during the 4th day postsurgery. This patient had diabetes, a varicous background and atrial fibrillation, enforcing to heparine administration for 7 days, followed by oral anticoagulation therapy for 21 days duration
- 2 deceases
  - patient 78 y.o. diagnosed with obesity and diabetes, developed massive pulmonary embolia in the 5th day postsurgery.
  - patient 69 y.o., smoker, diagnosed with vascular hypertension, atrial fibrillation, developed myocardial acute ischemia, in the 7th day postsurgery.

The recovery

119 presented “ad integrum” recovery.

3 cases with complicated renal failure, remained in our nephrologic following and, underwent chronic dialysis.

The series patients follow-up

We proposed a period of 3-9 month for the beginning and, than, yearly reevaluation (hardly respected by the patients), consisting in clinical exam, blood tests, bacteriologic exams, ultrasonography and, when required, i.v. pyelography and computer tomographic scans.

Conclusions

Pyonephrosis is a major diagnostic and treatment emergency due to its threatening on the contralateral kidney integrity, and its severe evolution. Diagnosis protocol will consider, as fast as possible, all the optimal techniques according to their availability and also, their paramount importance (clinical exam, lab tests, bacteriology and imagistic methods), in order to define the clinical form of the disorder and the evolution stage of associated illnesses.
Medical and surgical treatment will be targeted to remove the renal septic focus, to maintain water-basic balance, to prevent septic complications and blood clot formation and to reduce the embolic risk. At the same time treatment of coexisted disorders will be initiated and seriously maintained.

After surgery, all this patients with unique kidney will be followed-up according to their renal function parameters, aiming the early detection of any possible complication.

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