



**MEDICAL UNIVERSITY - PLEVEN
FACULTY OF MEDICINE**

DISTANCE LEARNING CENTRE

**DEPARTMENT OF “NEPHROLOGY,
HEMATOLOGY AND GASTROENTEROLOGY”**

PRACTICAL EXERCISES – THESES

FOR E- LEARNING IN NEPHROLOGY

ENGLISH MEDIUM COURSE OF TRAINING

SPECIALTY OF MEDICINE

ACADEMIC DEGREE: MASTER

PROFESSIONAL QUALIFICATION: DOCTOR OF MEDICINE

PREPARED BY DEPARTMENT OF NEPHROLOGY

PLEVEN, 2020

NEPHROLITHIASIS

DEFINITION: Nephrolithiasis is a disease as old as the human race. Kidney-stones may be formed and found in any department of the urinary tract – from the renal calyces to the bladder.

PART I – EXAMINING A PATIENT.

Asking basic questions –surname and first names, age, occupation, date of admittance to the hospital.

1.2. PRESENT COMPLAINTS - depend on the location and size of the calculus, as well as on possible complications.

(a) Small stones

Renal colic – typical of stones in size 3-10 mm, when passing via the ureter. The syndrome is characterized by:

- Unilateral pain in the abdomen, in depth of the waist and the back or contrariwise, or simultaneously at the front and the back. The pain begins suddenly and quickly reaches the maximum of severity. It is known as one of the strongest painful sufferings in human pathology.

- Spreading from above downwards and backwards along the lateral edge of musculus rectus abdominis to the corresponding inguinal and thigh inner-side regions. Sometimes the pain might be localized only in the testicle – the so called “phantom pain”.

- Different duration in time.

- Hypermobility and useless trials of finding painless position.

Hematuria – demonstrated by changes in the urine color of a different kind: red, rosy, brown-red etc.

Nausea and vomiting.

Attention must be paid to the typical of renal colic triad: obligatory pain, upper-dyspeptic syndrome, not always evident hematuria.

(b) Large stones:

- Dull pain at the waist.

- Hematuria.

- History of chronic uroinfection, namely periods of dysuria and pyrexia.

(c) In cases of collateral complications:

Pyrexia and episodes of fever, possibly combined with excreting of muddy urine at calculous pyelonephritis.

Unbearable unilateral pain in combination with fever as well as with hematuria and necrotic tissue particles in the urine at necrotic papillitis which in chief is a complication of obstructive uropathies.

Anuria after renal colic's at a complete obstruction of the urinary tract.

Complaints that are due to chronic renal failure at long-termed chronic calculous pyelonephritis.

1.3. PAST HISTORY:

- Previous renal colics.
- Data of chronic uroinfection in the previous period of time.
- Knowledge of present abnormalities of the urinary tract.
- Episodes of haematuria.
- Conditions of hyperuricemia - gout, myeloma, chemotherapy.
- State of urostatics in cases of prostate hyperplasia, structure of the urethra, congenital defects of the urinary tract.
- A prolonged immobilization e.g. after bone fractures.
- Hyperparathyroidism.

1.4. FAMILY HISTORY: relations with nephrolithiasis.

1.5. RISK FACTORS:

Alimentary – excessive consumption of animal proteins. Drinking water rich in calcium salts.

Professional – high temperature in the environment that leads to an increased perspiration and dehydration.

1.6. PHYSICAL EXAMINATION OF THE PATIENT:

1.6.1. Inspection: In case of a renal colic the patient is restless and in a state of searching for an “analgesic position”, i.e. hypermobility.

1.6.2. Palpation of the abdomen: palpatory aching at the relevant kidney area with no signs of muscle defence and peritoneal irritation. In case of hydronephrosis the kidney is palpated enlarged and painful to a great extent. Paralytic ileus is possible when the nephrolithiatic crisis had been extremely severe.

1.6.3. Renal succussio: gives a highly expressed positiveness.

1.6.4. Other findings: according collateral diseases and complications.

PART II – MAKING THE DIAGNOSIS

1. Discussing the findings of the medical examination.

2. Questions of importance:

2.1. *Location of the calculus.*

2.2. *Size of the stone.*

2.3. *State of urodynamics.*

2.4. *Possible complications.*

3. Choice of medical investigations:

3.1. Urinalysis:

- ◆ Hematuria. NB-missing at a complete obstruction.
- ◆ Leukocyturia –in case of available uroinfection.
- ◆ Possible proteinuria – always of a low degree.
- ◆ pH-value – acidic or alkaline.

3.2. Blood samples for:

- ◆ Red blood count – usually of a normal value.
- ◆ White blood count – raised at the presence of uroinfection.
- ◆ ESR – elevated in cases with uroobstruction and infection.
- ◆ Uric acid – might be elevated in certain conditions.
- ◆ Urea and creatinine – of values according the state of renal function.

3.3. Microbiological assessment of urine.

3.4. Image techniques:

3.4.1. *Ultrasonography* – of essential importance for measuring the kidneys, finding out disturbances of urine drainage, defining the size and location of present stones. The method is informative about calculi in the kidneys, the pyeloureteral segment and the bladder as well.

3.4.2. *Isotopic nephrography* – the rate of excretion of I¹³¹-hippuran indicates the renal efficiency bilaterally and shows possible alteration in the urine drainage. The method is applied after passing the pain over in cases with nephrolithic crises. A “hydronephrotic curve” is typical of an obstructed urine pathway.

3.4.3. X-ray examination: *simple-X-ray* scan does not give a good picture of the kidneys, but could be useful for imaging of Ro-positive stones and also for the following up of their migration along the urinary tract.

Intravenous pyelography/ IVP/ gives a clear image of the kidneys if they are working well enough to excrete the injected into a patient's vein contrast agent and indicates the renal efficiency as well. This method evaluates the presence of stones along the urinary tract, gives evidence of their size and location too and shows eventual disturbances in urodynamics. It has to be carried out 10-15 days after passing over a renal colic.

Retrograde pyelography: the contrast agent is injected upwards from the bladder by way of a cystoscope whereby a clear ureteral and of the renal pelvis image is received. This method is applied in cases of sensitiveness towards contrast substances as well as on account of a functionless from IVP kidney, creatinine of a value above 260 $\mu\text{mol/l}$, pregnancy.

PART III – DIFFERENTIAL DIAGNOSIS:

1. Of a right-sided nephrolithic colic - with:
 - cholelithiasis;
 - cholecystitis;
 - acute appendicitis.
2. In females – with inflammatory diseases of the genital tract.

PART IV– TREATMENT

1. Rules of importance:

- Complex management.
- Long-termed treatment.
- Individually précised approachment according the patient's state.

2. Possible mistakes:

- Simplified approach.
- Underestimation of the problem.
- Lack of qualification/incompetence/.

3. Treatment of a renal colic requires:

- combining of p. o. and p. e. medication;
- helping the elimination of a calculus through the ureter by.

4. Treatment of stones that can not be eliminated spontaneously:

- by extracorporeal lithotripsy, having in mind the indications for this method and according to the kidney functioning and the relevant ureter passability;
- by percutaneous litholapaxia;
- by surgery: pyelolithotomy, ureterolithotomy etc. Surgical treatment is obligatory at patients with calculous anuria, pyonephrosis, urosepsis.