

ODESSA NATIONAL MEDICAL UNIVERSITY  
Department of Urology and Nephrology

METHODICAL WORKING of practical training for teachers  
Topic 14. Prostate cancer. Differential diagnosis of prostate tumors.

Academic discipline "Urology"

**Level of higher education:** Second (Master's)

**Knowledge field:** 22 "Health Care"

**Specialty:** 222 "Medicine"

**Program of professional education:** Medicine

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## Topic 14. Prostate cancer. Differential diagnosis of prostate tumors.

### MAIN AIMS OF THE LESSON

General aims: since adenoma of prostate gland is one of the most common diseases of older males and among the malignant tumours of prostate most common is cancer, physician of any speciality may come across such diseases. This is why it is important to teach students the symptomatology and diagnostics of adenoma and cancer of prostate.

#### **Student should know:**

Clinical appearance of adenoma and cancer of prostate.

Identify stages of carcinoma.

Diagnostics of adenoma.

Complications of adenoma and cancer of prostate.

Treatment of adenoma depending upon the stage of the disease.

Assistance during acute urine retention.

Diagnosis (biopsy of prostate) and treatment of prostate cancer (extrogenotherapy, castration).

#### **Student should be able to:**

Palpate and do percussion examination of urinary bladder.

Conduct digital rectal investigation of prostate gland.

Conduct catheterization of urinary bladder.

Interpret on cystograms adenoma of prostate.

Locate metastasis of prostate cancer in bones in roentgenogramma.

In order to achieve the above goals it is important to recollect from the course of normal anatomy – prostate gland, seminal vesicle; normal physiology – functional specificity of urinary bladder; pathological physiology – pathogenesis of changes in kidneys during urine outflow restriction; pathological anatomy – tumours of prostate gland (cancer of prostate and adenoma of preurethral glands).

#### Connection to other disciplines.

In the II and III stages of adenoma of prostate glands, several general symptoms are noted. The main cause of which is the uremic intoxication, which develops due to the renal failure. Such patients as a rule have substantial azotemia, which may sometimes reach high values. Patients are pale and complain of polyuria. Often they have edema of lower extremities. Often disturbances of GIT are also noted. The so called uric dyspepsia arises. Sometimes it is so acute that may overshadow urinary symptoms. Loss of appetite strong thirst, constipation or diarrhoe, nausea and vomiting may be noted. Anemia develops accompanied by disturbances of

cardiovascular system and dilation of heart chambers, edema, increased BP and difficulty in breathing. With the above symptoms patient is often admitted to the general medicine ward, this is why the knowledge of this disease is vital for the future interns.

In patients of the therapeutics wards, suffering from infarction of myocardium, stomach ulcers, etc., receiving atropine or similar preparations, acute urine retention may develop.

In older aged persons after different surgical operations (appendectomy, section of hernia, resection of stomach, cholecystectomy and others), urine retention caused by the adenoma of prostate may be noted. Catheterization of the bladder may be required for its evacuation.

The extended urinary bladder in the II stage of the adenoma of prostate gland due to the presence of a large amount of residual urine may be confused with inter fold cyst or cyst of the ureter. Overextended urinary bladder due to the presence of a large volume of residual urine has very thin walls and may easily be ruptured by small traumas of the abdomen the intra or extra abdominally.

Except for the above prostate cancer as a rule has metastasis in the bones system and pathological bone fractures may be noted. This is why it is important for traumatologists to know.

Disturbances in micturition may be caused not only by adenoma of prostate gland, but also in neurogenic hypotony or atony of urinary bladder, which may be caused by disease of central nervous system. In such patients due to the decreased sensitivity of urinary bladder, urges to micturate are often rare and they approach physicians in a condition of severe atony. For hypo and atony of urinary bladder, absence of obstruction and presence of "tower" shaped bladder is characteristic in cystograms. In the cancer of prostate gland with metastases in the bones of pelvis and in lower sections of the vertebral column, the clinical picture of lumbo-sacral radiculitis develops. Such patients often receive physiotherapy in the lumbo-sacral region, which is absolutely contraindicated. All future neuropathologists should remember about this.

Disturbance in urine outflow from urinary bladder and upper urinary tract, which is present in adenoma of prostate gland, may lead to chronic pielonephritis (with an outcome of nephrosclerosis) and development of chronic renal failure.

Slowly under the influence of intoxication and dyspepsia the general condition of the patient becomes more severe. They "lose weight, skin covers attain an earthen shade, the so called urea cachexy" develops, during which malignant neoplasm may be suspected.

As is visible from above mentioned the knowledge of clinical manifestations of prostate glands is important not only for specialists urologists, but also for doctors of other specialities.

## MAIN POSITIONS OF THE LESSON

Adenoma of prostate gland is a benign tumour, more common in older men. Main role in the genesis of this disease is played by the hormonal factors. Decrease in

the activity of the testes may be accompanied by increased production of gonadotropic hormones from the frontal lobe of hypophysics. Activity of this hormone leads to thickening of paraureteral glands and formation of adenoma.

During histological investigations adenoma is differentiated into glandular adenoma, fibroadenoma and nodule adenoma.

This disease is divided into three stages based on the symptoms and clinical outcome.

Compensation;

Subcompensation; the “chief manifestation of this stage is the symptom of residual urine”;

Complete decompensation of the urinary bladder and prolonged renal failure. It is characterized by paradoxical isuria.

#### Complications of adenoma of the prostate gland:

Acute urine retention.

Hematuria.

Stones of urinary bladder.

Inflammatory diseases (urethritis, cystitis, prostatitis, epididymitis, epididymo-orchitis, acute and chronic pielonephritis).

#### Diagnostics of the adenoma of prostate gland:

Results of examination, percussion and palpation, specially rectal digital examination. During which the prostate gland is increased in size, of smooth surface, of dense elastic consistency.

Instrumental methods of investigation:

catheterization of urinary bladder

cystoscopy

Roentgenological, radioisotope and echographic methods of diagnostics, uroflowmetry.

Differential diagnosis of adenoma of prostate gland should be conducted with the following diseases: cancer of prostate gland stricture of urinary tract, sclerosis of the bladder neck, neurogenic hypotony and atony of urinary bladder.

#### Treatment of adenoma of prostate gland.

The main treatment is surgical, which could be radical or palliative.

Conservative therapy, preparations of gonadic hormones – mainly male hormones.

Radical operation involves the extraction of adenoma through a perineal, retropubic or more often intravesicular access. Epicystomy and transurethral electroresection are the palliative methods of treatment.

#### Cancer of prostate gland.

Symptomatic and clinical manifestations of this disease is mainly associated with disturbance in urine passage: frequent and difficult micturition, presence of residual urine. Pain in the perineal and lumbosacral regions. In later stages hematuria and acute retention may also be noted. In case of pressure on the intra

mural or near vesicular sections of the ureter, symptoms associated with upper urinary tract can be noted: pain in the region of kidneys, signs of renal failure, possibly anuria.

#### Diagnostics of prostate cancer

Results of examination, percussion and palpation, special rectal digital examination.

Blood serum investigation of acidic phosphatase.

Roentgenological, radioisotope and echographic methods of diagnosis, uroflowmetry.

Investigation of the prostate secretion for presence of atypical cells.

#### Treatment:

Operative and conservative. Radical operation – prostatectomy. Palliative operation epicystoscopy, transurethral electroresection, castration and enucleation of testes.

Conservative treatment – estrogen hormones.

#### CURATION CARD OF THE PATIENT

adenoma of prostate glands.

While collecting anamnesis find out:

Frequency and duration of micturition – whether any difficulty in it.

Character of urine stream, whether nocturia?

Whether micturition is improved after walking or physical exercise?

Whether there is a feeling of incomplete evacuation of the urinary bladder after micturition or involuntary micturition?

Whether there is excessive thirst, dryness of mouth, decreased appetite, nausea, vomiting, indirect signs of renal failure?

Whether acute urine retention was noted in the anamnesis and what assistance received.

Whether noted hematuria which may be due to the presence of varicose of veins of bladder neck?

Whether any stones were passed without pain or colic attacks?

Whether any indications of complications: urethritis, cystitis, prostatitis, epididymitis, acute pielonephritis?

While assessing objective results:

Pay attention to the swelling of frontal abdominal wall in the supra pubic region, conditioned by the overfilling of urinary bladder or presence of residual urine.

Dry tongue, covered with a brownish film may indicate substantial intoxication, as a result of renal failure.

Urge to urinate during deep palpation of supra pubic region immediately after evacuation of bladder indicates the presence of residual urine.

Percussion of supra pubic region before and after micturition may help assess the presence of residual urine.

Of main importance is the digital rectal investigation, during which attention should be paid to the size, surface and consistency of prostate.

Instrumental and roentgenological methods of investigation.

Catherization of urinary bladder.

Cystoscopy: tubercular walls of the bladder, false diverticules, varicose of veins of bladder neck and positive symptom of “curtain”.

In excretory urogramm – widening of ureters and pelvo-calyces system, positive symptom of “fisherman’s hook”.

In descending cystogram, the bladder is lifted, a filling defect of the form of hill in the region of bladder neck.

Supplementary X-ray done after micturition may allow to determine the presence of residual urine, depending upon the degree of retention of contrast medium in bladder.

In the ascending cystogram by Knaize-Schobert, not only the picture of adenoma is visible but also the presence of concurrent diseases of bladder (stone, tumour) could be determined.

Not so rarely, during cystography in paraurethral adenoma vesico-ureteral reflux could be noted.

Data of uroflowmetry.

Ultra sound investigation.

## CURATION CARD OF THE PATIENT

with prostate cancer

While finding out complaints and anamnesis of diseases it’s important to know:

Whether there is any disturbance in micturition (frequent, difficult, painful, etc.).

Whether the patient has a feeling of incomplete evacuation of urinary bladder?

Whether acute urine retention reported earlier?

Presence of hematuria in history?

Whether the patient is suffering from pain in the perineal region, anal region, lumbo-sacral region?

Whether suffered bone fractures lately?

Does the patient suffer from malaise, dryness, of mouth, thirst, loss of appetite, nausea, polyuria?

Whether noted any loss in weight?

Objective and roentgenological investigations.

Whether swelling is noted in the abdominal wall in the supra pubic region, caused by the presence of urine.

Dryness of tongue covered with brown film may indicate of intoxication due to renal failure.

Digital rectal investigation may be the chief investigation in recognizing this disease, attention should be paid to the sizes, surface, consistency of the prostate gland and the mobility of the rectal mucous membrane.

In the excretory urograms disturbance of the urine passage along ureters may occur, sometimes may lead to complete occlusion of ureters.

In urethrocytograms the base of the urinary bladder is asymmetrically elevated, filling defects with uneven contours in the region of the neck of the urinary bladder.

In the genitograms a filling defect and deformation of seminal vesicles.

In the roentgenograms of the pelvis, osteoblastic or osteoclastic metastases are noted.

Radioisotope investigations allow to reveal cancer of prostate and metastases.

Results of echoscanning allow to confirm cancer of prostate gland.

Results of uroflowmetry may also be helpful.

## CASE STUDIES

65 year old patient complains of inability to micturate with pain in the lower abdomen. The above symptoms arose since 14 hours.

Your preliminary diagnosis? Your recommendations for diagnosis and treatment?

70 year old patient complains of malaise, headache, vomiting, involuntary dripping of urine. Skin covers pale. Dryness of tongue, covered with brown film. Soft abdomen. Symptom of Pasternatsky negative on both the sides. During percussion the urinary bladder is determined 6 cm above the pubis. Prostate gland is increased in size evenly, firm elastic consistency. Surface is smooth, interlabular fissure is smoothed. Serum urea 29.9 mmol/l.

Your preliminary diagnosis? Recommendations for treatment?

62 year patient, feels difficulty in micturition, urine stream is weak and thin. Skin covers normal. Tongue moist, not covered by a film. Abdomen soft and painless. Symptom of Pasternatsky negative on both the sides. Urinary bladder is not determined by percussion. External reproductive organs developed normally. By digital rectal investigation prostate gland is moderately increased in size, right lobe is tuberos, of stony consistency, painless. Mucous membrane of rectum above the right lobe is fixed.

Your preliminary diagnosis? Which investigations are necessary to confirm the diagnosis?

A 65 year old patient complains of difficulty in micturition with weak stream, nocturia 3-4 times. Considers himself ill since last 2 years, when first noticed micturition during the night. Skin covers and visible mucous membranes of

normal colour. Organs of rib cage and abdominal cavity without any changes. Kidneys not palpable. Symptom of Pasternatsky negative on both the sides. Urinary bladder upon percussion is hollow. During digital rectal examination the prostate gland is noted to be slightly increased in size with smooth surface, film-elastic consistency, painless.

Which diseases could be suspected? Which diagnostic methods could confirm the diagnosis?

A 63 year old patient complains of pollakiuria, nocturia 4-6 times, thin urine stream. Twice suffered from acute retention of urine. After single catheterization of the urinary bladder urination was reinstated. Palpation reveals an elastic spherical formation of the size 6 x 8 cm. Percussion above the formation is blunt. During digital rectal examination, prostate gland is revealed to moderately increased in size, with smooth surface, elastic consistency and painless.

Your possible [?] diagnosis? Which investigations should be performed to confirm the diagnosis?

60 year old patient was treated by a neuropathologist on account of lumbosacral radiculitis, but a month after treatment he was admitted to the traumatology ward with metastases in lumbo sacral sections of the vertebral column, bones of pelvis and fracture were noted.

What was the mistake of the neuropathologist? Which investigations were necessary for the patient before beginning physiotherapy?

## CONTROL QUESTIONS

What is the adenoma of prostate gland, from the point of view of neorhogenesis?  
What happens to the prostate gland in case of adenoma of paraurethral glands?  
Which pathoanatomical changes take place in the upper and lower urinary tracts in case of adenoma of prostate?

In which three stages is the clinical appearance of the disease divided?

What is the symptom of residual urine and how is it determined?

What is paradoxical ishuria?

In which stage of the disease can develop acute urine retention?

Complications of the adenoma of prostate?

Diagnostics of adenoma of prostate?

Differential diagnostics?

What are the indications for radical surgical treatment?

Which accesses are used for such operations?

What are the indications for palliative operations?

What immediate assistance could be accorded to such patients?

Symptomatics and clinical appearance of prostate cancer?

How frequent is prostate cancer?



Which roentgenological signs are characteristic of prostate cancer?

What are the changes in acid phosphatase in the serum of patients with prostate cancer?

What are the indications for radical prostatectomy?

Indications and types of palliative operations in prostate cancer?

Which hormones are used in treatment of prostate cancer?

## SAMPLE ANSWERS TO CASE STUDIES

Considering the age of the patient, acute urine retention may be caused by the adenoma of prostate gland. After the conduction of digital rectal investigation, catheterization of urinary bladder, preferably by Timon's catheter. In the absence of renal failure excretory urography with descending cystography by the method of Knaize-Schobert is recommended. Further the patients should be prepared for radical treatment - adenomectomy.

Involuntary dripping of urine with overfilled urinary bladder and increased prostate gland are the signs of paradoxical isuria, characteristic of adenoma of prostate glands in the III stage. This stage is also accompanied by renal failure, anemia, electrolyte imbalance, intoxication which is presented as malaise, nausea and headaches. In such cases cystostomy followed by disintoxication therapy, correction of electrolyte balance and preparation of the II stage of adenomectomy. Considering the age of the patient, difficulty in micturition, weak stream, stony consistency of the right lobe of prostate gland we could suspect a malignant tumour. For confirming the diagnosis it's necessary to investigate the secretion of prostate gland for atypical cells, X-ray of pelvis, excretory urography with descending cystography for investigating the condition of upper urinary tract and the degree of proliferation of the tumour into the cavity of urinary bladder, urethrography – for defining condition of the prostatic part of the urethra. And finally the most confiding would be the biopsy of prostate.

Clinical signs are characteristic of adenoma of prostate in the I stage. For confirming diagnosis it is important to conduct plain and excretory urography. In this case for the I stage of adenoma would be characteristic to retain the functions of kidneys. X-ray signs of adenoma – symptoms of “hill” or “parachute dome”. In case of confirmation of diagnosis single moment adenomectomy may be indicated.

Preliminary diagnosis – adenoma of prostate gland in the II stage. For confirming the diagnosis it is recommended to conduct radioisotope renography with determination of residual urine in the urinary bladder, collect information about the adenoma by cystoscopy, cystography, ultrasonography investigation.

Basic clinical symptoms of cancer of prostate gland could sometimes be continuing, severe radiculalgia, which are sometimes considered by neuropathologist as primary radiculitis. In this particular case, the physiotherapy was contraindicated as it causes rapid growth of tumour and faster metastases. The most favorite site of metastases is the bones of pelvis and vertebral column. It could be conferred from this case, that any aged patient suffering from pain in the

spinal cord should be examined by urologist for excluding pathology of prostate gland.

Developers:

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### **Recommended literature.**

#### **Basic:**

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2. Pasechnikov S.P. Modern problems of urology: [manual]: doctor's guide/ S.P. Pasechnikov, V.I. Zaitsev. - Kyiv: L-ry Health of Ukraine; 2017.
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4. Sarychev L.P. Symptoms of urological diseases: method. rec. For teachers / L. P. Sarychev, S. M. Suprunenko, S. A. Sukhomlyn, Ya. V. Sarychev. – Poltava, 2019.
5. O.V., Lyulko, O.F. Voizianov Textbook "Urology" 3rd edition. Thresholds Dnipropetrovsk. - 2012 p.
6. "Urology (Methodical development of practical classes for students)" edited by Professor V.P. Stus, second edition, supplemented. / A.P. Stus, Moiseenko M.M., Fridberg A.M., Pollion M.Yu., Barannik K.S., Suvaryan A.L., Krasnov V.M., Kryzhanivskyi O.Yu. - Dnipro: Accent LLC. - 2018. - 336c.
7. Urology: textbook for students. higher med. academic established: translation from Ukrainian publications / S.P. Pasechnikov, S.A. Voizianov, V.N. Lesovoy, F.I. Kostev, V.P. Stus, et al./ Ed. S.P. Pasechnikov - Edition 2. - Vinnytsia: Novaya Knyga, 2015. - 456 p.: illustr.
8. Urology: textbook for students of higher medical education Institutions /S.P. Pasechnikov, S.O. Voizianov, V.M. Lesovoy (et at.); ed. by Pasechnikov. / S.P. Pasechnikov, S.O. Voizianov, V.M. Lesovoy (et at.) - Vinnytsia: Nova Knyha, 2016. - 400 p.
9. EAU Guidelines, edition presented at the 28th EAU Annual Congress, Milan 2021. ISBN 978-90-79754-71-7. EAU Guidelines Office, Arnhem, The

Netherlands.

10. Alan W. Partin, Alan J. Wein, et. all - Campbell Walsh Wein Urology, E-Book (12th ed.) – 2020.

11. Omar M. Aboumarzouk - Blandy's Urology, 3rd Edition – 2019.

12. David Thurtle, Suzanne Biers, Michal Sut, James Armitage. - Emergencies in Urology – 2017. 4. Philipp Dahm, Roger Dmochowski - Evidence-based Urology, 2nd Edition – 2018.

#### Additional:

1. Boyko M.I., Pasechnikov S.P., Stus V.P. and others Clinical andrology // Doctor's guide "Androlog". - K.: LLC "Library "Health of Ukraine", 2013. - 222 p.
2. Sarychev L.P. Clinical anatomy and physiology of organs of the urinary and male reproductive system: method. rec. for teachers / comp. L. P. Sarychev, S. A. Sukhomlyn, S. M. Suprunenko. – Poltava, 2019. – 11 p.
3. Sarychev L.P. Symptoms of urological diseases: method. rec. for teachers / L. P. Sarychev, S. M. Suprunenko, S. A. Sukhomlyn, Ya. V. Sarychev. – Poltava, 2019. – 14 p.
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6. Urology / Ed. Prof. O.S. Fedoruk - Chernivtsi: Bukovyna State Medical University, 2011. - 344p.

#### Information resources:

University website <https://onmedu.edu.ua>

Library [library.odmu.edu.ua](http://library.odmu.edu.ua)

1. <https://uroweb.org/>

2. <https://www.nccn.org/>

3. <https://www.auanet.org>

4. <https://www.inurol.kiev.ua/>

5. <https://www.souu.org.ua/>