ODESSA NATIONAL MEDICAL UNIVERSITY

Department of Urology and Nephrology

METODICFL RECOMENDATIONS
to the practical lesson for students :

Academic discipline "Urology"

Lesson № 6 Traumatic injuries of lower urinary tract and male reproductive system. Urogenital fistulae in women.

Academic discipline “Urology”
Level of higher education: Second (Master’s)
Knowledge field: 22 "Health Care"
Specialty: 222 "Medicine"
Program of professional education: Medicine

Approved
methodological meeting on the chair
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Protocol № 1
Head. Chair prof. F.I. Kostev

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The theme of the lesson Traumatic injuries of lower urinary tract and male reproductive system. Urogenital fistulae in women.- 2h

AIMS OF THE LESSON

General objectives: to teach the students principles of diagnostics and treatment of traumas of kidneys, urinary tract, and urinary bladder.

Student must know:

1. Classification of renal traumas .
2. The symptomatology and methods of diagnostic of traumas of kidneys.
3. Indications of the operational and conservative treatment of injured kidneys.
4. Classification of traumas of urinary bladder.
5. Symptoms and diagnostics of extra- and intra- peritoneal ruptures of the urinary bladder.
6. Pathogenesis of the urinary tract injuries.
7. Clinics and diagnosis of ureter ruptures.
8. Principle of the operational treatment of urethra.

Student should know how to:

1. Palpate and percutate kidneys and urinary bladder.
2. Conduct retrograde cystography and urethrography.
3. Interpret patients rentgenogramms with the injuries of the urinary system.

In order to achieve above goals a student should recollect from the course of normal anatomy – kidney: form, structure, topography, relation to the peritoneum; urinary bladder: relation to the peritoneum and to the neighboring organs, male and female urinary tract.

Topographical anatomy: capsules and kidneys support apparatus, porta of kidney, erus of kidney, prevesical and paravesical celular space, topography of male and female urethra, pelvic fat drainage (Bujalski-Mcllorther), inhapelvic novocain blockade (Shcolnikov).

Relations with other subjects

Injuries of kidneys often can be connected with injuries of other inner organs. It is a hard problem to distinguish kidneys' injury, or to solve question about parallel damages. Together with the damage to kidney, there can also be other symptoms as factors of internal bleeding. The diagnostic is most difficult in cases when patient is under syncope, alcoholic intoxication.

Carefully collected anamnesis of injury mechanism, the urine examination will allow surgeon to take bearing and to invite urologist for consultation, or if there is no urologist, to carry out an excretory urography.

In large number of cases the damage to kidney is distinguished by a surgeon on an operating table during laparotomy in a case of intendent ruptures of inner organs or acute abdomen. In such a situation it's necessary to consult patient with urologist immediately to solve the course of further treatment.

Before the beginning of the operation, surgeon has to examine conditions of urinary system, to carry out a urine analyses immediately if patient has damages of inner organs.

If during this analyses hematuria is found, it has to be a signal to an X-ray examination.

Kidney injuries are often concomitant with rib fracture. In case of fractures of X; XI; XII ribs the traumatologist has to examine kidneys condition.

The pelvic fractures are often concomitant intraperitoneum ruptures of the urinary bladder and urinary tract.

The first aid in such cases accorded by traumatologist, must know how to carry out rethrograde urethrography or cystography or how to operate the patient.

BASIC PRINSIPLES OF THE LESSON

Due to anatomical peculiarities, kidneys are often injured together with organs of abdominal cavity. All injuries are divided into open and closed injuries. Closed injuries are: pararenal hematoma and rupture of kidney capsule, subscapular rupture of the pareuhynk damages of parenchyma with penetration of rupture into pelvo-calycer system and without penetration, plural ruptures (crushing) of kidney; estrangenment of crus of a kidney; contusion of a kidney.

The most often symptoms of injured kidneys are: ace in lumbar area, total macro- and microhematuria, swelling in perirenal area because of hematoma (urohematoma), limitation of diaphragma mobility from the injured side, symptoms of internal bleeding.

The diagnostics of kidney damages consists of: anamnesis (indication of an injury), chromotocystography (determine the source of bleeding and separate kidneys function), escretorial urography (condition of injured and collateral kidney).

The most complete results about the character of injury can be revised with the help of kidneys artheriography. Rethrograde pyclography has to be used only in the cases, when excretorial urography is not sufficiently informative and there is no possibility of conducting an angiography.

The conservative therapy is conducted in a concious patient with absence of profuse hematuria and symptoms of internal bleeding, small and not enlarging hematoma around kidneys. Such patients are advised to stay in bed, prescribed ice-bottle on the lumbar area and corresponding part of the stomach, and bacterial and hemostatic therapy.

Such treatment is conducted only in hospital with constant control of hemodynamics and degree of hematuria.

Operative treatment is indicated in patients with symptoms of internal bleeding, increasing urohematoma which lead to the anemisation of the patient.

Kinds of operating treatment: stitching the rupture and draining the pelvocalyces system (nephrostomy, pielostomy), resection of kidney, nephrectomy, removal of paranephral hematoma.

Traumas of the urinary bladder are divided into intraabdominal, extraabdominal and combined. Extraabdominal injuries are often associated with fractures of the pelvic bones. Intraabdominal are the result of direct blow to an overfilled urinary bladder (hydraulic blow). In case of the latter alcoholic intoxication plays a very vital role.

Symptoms of extraabdominal rupture: inability to urinate despite frequent urges, associated with small urine discharges with mixed blood, pain above the pubis. Later on are noticeable the symptoms of urinary edema. While extraabdominal ruptures present the following symptoms: inability to urinate, urges to mictition , symptoms of acute abdomen, symptom of “constant-erection”. The main method for diagnostics of urinary bladder ruptures is retrograde cystography, while polypositional cystography plays a very vital role, and delayed cystography after the removal of X-ray contrast from the urinary bladder.

Treatment of intraabdominal ruptures: cleaning access to the urinary bladder, stitching of the rupture, cystostomy, draining of panniculus (Bujalsky-Mcwarther) or according to Kupriyanov (through gluteal-rectal cavity) and others. Intraabdominal – laparotomy, drying and draining of the abdominal cavity, suture of the rupturecystostormy. In case of females with small ruptures instead of cystostomy it may be possible to introduce port operative drainage of the urinary bladder (permanent catheter) into the urethra.

In case of bloms into the perineum, falling on it may be the cause of injury to the bulbular part of urethra while in case of fractures of the pelvis the membranous part is injured.

Symptoms of urethral rupture: urethro arrgia, ishuria (complete or partial urine retention), pain, presence of hematoma (urohematoma) in the perineum. Retrograde urography plays a vital role in the diagnostics of urethral ruptures.

Treatment of complete ruptures is only operative. Primary suture of urethra is possible only in a patient in satisfactory general condition not later than 6 hours after the injury has taken place, absence of significant urenic infiltration of urohematoma, performed by a highly qualified surgeon. In all other cases epicystostomy with compulsory drainage of urohematoma is indicated.

Direct result of traumatic injuries of urethra is the development of strictures.

CURATION CARD OF THE PATIENT

While defining the complain clarify:

1. Character and localization of pain (in the lumbar region, abdomen, above pubis, perinem).
2. Presence of hematuria, urethroarrgia.
3. Character of micturition (frequency, painful micturition, feeling of evacuation of urinary bladder, quantity of discharged urine in each micturition from the moment of trauma).
4. Complains connected to the damages of other organs.

While collecting anamnesis, determine:

1. Time and character of the trauma (blow on the lumbar region, suprapubical region, perineum, falling from big heights, etc.).
2. What did the patient feel after the trauma, by whom and what assistance was accorded.
3. Did the patient suffer from any other disease of kidney earlier, or that of UT.
4. Time and character of hematuria, urethroarrgia.
5. When did the patient have the first urge to micturate after trauma, how did it take place, didn't the pain increase during micturition.

In objective examination: essentially determine:

1. General condition of the patient (shock, collapse, signs of alcoholic intoxication).
2. Position of the patient (forced, psoasis, symptom of toacs position, symptom of constant erection, scoliosis.
3. Colour of skin covers, mucous membranes, presence of abrasions, cuts, bleeding, swelling of dark violet colour (urohematoma).
4. Presence of deformation (swelling of lumbar region, [??] of abdomen, avove pubis, in the perineal region). Crepitaliora (subdermal emphysama).
5. Condition of the skeletal system and joints (verteral, ribs and pelvis).
6. By palpation of the abdomen, determine any symptoms of acute abdomen, presence of free symptoms of acute abdomen, swelling or presence of palpable mass in the infracostal region due to paranephral hematomas, palpate suprapubical region urethra, perineum.
7. Auscultation – limited mobility of the diaphram, on the damaged side.
8. Macroscopic examination of urine.

While assessing laboratory tests analyses:

1. General urine analysis
2. General blood analysis

Analysis of X-ray methods of investigation

1. In a PA view X-ray film assess the condition of the skeletal bones (presence of fractures scoliosis) absence of contours of kidney on the affected side, disappearance of the contours of lumbar muscles due to the urohematoma).
2. I an excretory urogram determine the possible signs of kidney damage (weak and delayed filling of pelvocalyces system with the contrast, extra renal leaking of contrast. Absence of contrast excretion on the affected side.
3. Determine signs of damages in the arteriogram.
4. During suspected traumas of the bladder or UT retrograde cysts and urethrography is conducted. In case of extra abdominal ruptures, the contrast medium is noted to leak outside the organs in the shape of a homogenous mass, while during intraabdominal ruptures leakage is noted as the shape of "flame".

Assessment of results of instrumental investigations:

1. In case of suspected trauma of kidney – chromo cystoscopy.
2. Rupture of bladder – catheterization.
3. In suspected ruptures of the urether instrumental investigations are contraindicated.

On the basis of the above information define a diagnosis.

Notify the treatment strategy (whether operative or conservative - type of operation).

CASE STUDIES

1. A 43 year old male, brought to the clinic on account of pain in the left lumbar region which began after falling from a height of 2 m. Macrohematuria was noted during the 2 urine discharges after the trauma.

Normal BP and pulse. No changes in the abdominal cavity and no cage. Presence of small organs of swelling in the left lumbar region.

Point out the preliminary diagnosis and notify it.

2. 25 year old male patient was admitted to clinic on account of pain in the right lumbar region, macrohematuria with dots.

An hour back the patient suffered a blow by a hard object in the right lumbar region. Forced position: significant scoliosis towards the affected side.

Painful swelling in the right intracostal region. Pulse 128 beats/min, BP 85/50 mm Hg. No signs of acute abdomen, no extra fluid is determined in the abdomen. Left kidney is of usual size as seen in the excretory urogram, pelvocalyces system is not changed, and passage of contrast medium is unhindered along the ureter. While on the right side contrast medium is not determined in the projection of kidneys and UT.

Chromocystoscopy: from the opening of right ureter blood flows out in a stream, indigocarmine did not appear until 12 minutes of observation, while on the left side urine is tinted by indigocarmine and appeared in 7 minutes.

Your diagnosis? Treatment strategy? Is there any purpose in conducting any other supplementary investigation?

3. 35 year old patient, admitted to clinic on account of pain in the supra region, ishuria. Three years back, while in the condition of alcoholic intoxication, received a blow on the supra pubic region. Despite strong urges to micturate is unable to micturate. Forced position – sitting. Symptom of "constant erection". During rectal investigation, the front wall of rectum is determined to be hanging. Free liquid can be determined in the abdominal cavity on percussion.

Your preliminary diagnosis? Diagnostic and treatment strategy.

4. The patient has been clinically and by X-ray has been determined to be having extraabdominal rupture of the urinary bladder.

Your strategy of treatment.

5. A 40 year old male was admitted to the clinic on account of urethroarrgia. An hour back he fell down and was struck at perineum by a board on a construction site. Your preliminary diagnosis? Which methods of investigation are indicated here?

A 42 year old male patient of the traumatological ward, where he was admitted 2 hours back after a road accident in the state of shock. After recovering from shock an X-ray fil of the pelvis was made which shows the fracture of the pubic bone on left. Unable to micturate voluntarily, an increased bladder is palpable, in the region of outer opening of urethra "baked" blood is noted.

What is the diagnostic and treatment strategy?

ANSWERS TO THE CASE STUDIES

1. Pain, macrohematuria, presence of swelling in the left lumbar region could indicate a damaged left kidney. Excretory urography should be conducted in order to assess the changes in the kidney, which would allow us to determine the signs of injury to the left kidney (weak or delayed filling of the pelvo-calyces system by contrast medium or its complete absence on the side of trauma) and the condition of the contralateral.

2. Anamnesis and objective observations point to a damaged right kidney. Apparent as well are the signs of bleeding from kidney, which has brought down BP and increased pulse rate. But the character of damage is uncertain, which is why renal angiography is indicated. If it is not possible to conduct angiography, laparotomy is indicated. The type of operation would depend upon the extent of the damage.

3. Suprapubic pain, ishuria arising after trauma forced witting position of the patient, presence of "constant-erection", hanging of the front wall of rectum are symptoms of intraabdominal rupture of the urinary bladder. Retrograde cystography is indicated here, which would reveal leakage of the X-ray contrast medium outside the bladder in case of its rupture. The patient is indicated urgent operation – lapantomystitiching of the urinary bladder, epicystoscopy (extraabdominal).

4. Extraabdominal rupture of the bladder is an indication to operation – cystomy, revision of the urinary bladder, stitching, draining of the bladder (epicystostomy) and para vesicular

as per Bugalsky-MacWarther or by other methods.

5. Fall on the perineum followed by urethroarrgia allows us to suspect of post traumatic rupture of UT. Essential to conduct retrograde urethrography in this case.

6. The fracture of pelvic bones here is plansibly associated with complete rupture of urinary tract. Urethrography is urgently indicated the confirmation of such a diagnosis epicystomy, primary structure of the urethra and draining of urohematoma is indicated.

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Recommended literature.
Basic:

1. S.P. Pasechnikov; Urology: textbook/ Ed. S. P. Pasyechnikova, S. A. Vozianov, V. N. Lesovy [and others]. - View. 3rd – Vinnytsia: New Book, 2019.
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.
3. Stus V.P. Urology (practical skills for intern doctors) / V.P. Stus, S.P. Pasechnikov. Teaching and methodical manual. - Dnipropetrovsk: Akcent PP LLC, 2016.
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. Vozianov 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, Moiseinko 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. Vozianov, 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. Uro1ogy: textbook for students of higher medical education Institutions /S.P. Pasechnikov, S.O. Vozianov, V.M. Lesovoy (et at.); ed. by Pasechnikov. / S.P. Pasechnikov, S.O. Vozianov, 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.

4. Medical student's library. Urology. Edited by F.I. Kosteva. - Odesa, 2004. – 296p.
5. Atlas-guide to urology. Ed. A.F. Vozianova, A.V. Lulko Dnipropetrovsk, 2002.-T. 1,2,3
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
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/