

## THE IMPORTANCE OF COMPUTED TOMOGRAPHY IN THE DIAGNOSIS OF URETEROLITHIASIS AND ITS COMPLICATIONS

*Xojiraxmatov Davron Kamolidinovich*

Assistant of the Department of “Hospital therapy” at the Fergana Institute of Public Health Medicine

**Abstract :** To diagnose ureterolithiasis and its complications is to assess the possibilities of Computed Tomography. The problem of detecting ureterolithiasis remains very relevant. Patients with kidney and urinary tract stones make up 40% of the total contingent of urological hospitals, the number of which is increasing. According to the World Health Organization, in most developed countries, the incidence rate of urolithiasis reached 1-2%, and the most able-bodied part of the population (30-55 years old) was affected and called the disease of the people or civilization.

**Keywords:** ultrasound (UTT), nephrolithiasis, calculuria, pyelonephritis, lithotryptor, salt crystals, ureterolithiasis, computed tomography.

### INTRODUCTION

The leading clinical syndrome of uretholithiasis is renal colic, the clinical diagnosis of which leads to difficulties due to the variety of signs of its manifestation and polymorphism. In most cases (up to 90%), the cause of acute urinary tract obstruction is ureterolithiasis, the clinical manifestations of which depend on a number of factors: the size, number and location of stones, the duration of the disease, the one-or two-way nature of injury, the inflammatory process in the kidneys, disorders of Urodynamics, changes in kidney function. (Weinberg Z. S.; Lopatkin N. A., 2016).

Traditional radiation diagnostic methods (obzor and excretory urography, retrograde pyelography) play a leading role in the diagnosis of ureteroliasis (Zolotarev I. I., Savello V. E., 2013), but they do not allow the recognition of small and rentgenegative stones in all cases, are dangerous with possible complications and do not fully reflect the degree and nature of morphological changes (V. I. Bakalov, 2017). New methods of radiation diagnostics (ultrasound, CT, MRI) have opened up additional possibilities in the diagnosis of ureterolithiasis (Nikitin A. T. etc., Kishkovsky .N., 2015; RosenC.L.étal., 2011)



At the same time, for the final determination of the diagnosis, additional development of the visual semiotics of ureterolithiasis (secondary signs) is required, the volume and sequence of application of various radiation methods, the ratio of their information composition and value, remains completely undetermined (Karmazanovsky G. G., 5 Kharchenko V. P., 2009; V. K. Catsarocetal., 2016), choosing a diagnostic program for renal colic (Perelman V. M., 2015; Lindenbraten L. D. etc., 2018). These causes lead to the need to further develop and improve the methods and methods of radiation testing of patients with ureterolithiasis, to develop an acceptable tactic of radiation diagnostics and semiotics for ureterolithiasis.

Ureterolithiasis is a chronic disease characterized by a violation of metabolic processes in the body, the development of local pathological changes in the organs of the urinary system, the appearance of stones in it. According to the WHO, in most developed countries, the incidence rate of urolithiasis reached 1 - 2%, was called folk or civilizational disease and does not have a downward trend. The composition of urological patients is second only to inflammatory nonspecific diseases of the kidneys and urinary tract. Patients with kidney and urinary tract stones make up 20-40% of the contingent of urological hospitals. In Moscow clinics, about 200 thousand patients of this profile are treated every year, ureterolithiasis is the third most common cause of death in urological patients.

Many authors associate the high frequency of the disease with local conditions and pay attention to the geographical risk factor of urolithiasis. Ureterolithiasis occurs in all countries, its uneven distribution, dependence on climatic factors are noted, seasonality of the disease, ethnographic aspects are described, the sex ratio and the role of age are noted. Urolithiasis can be observed at any age, but most often manifests itself between the ages of 30 and 55, that is, among the most able-bodied part of the population. Men are less sick than women. The gender distribution of the disease ranges from 1: 1.5 to 1: 1.2 at the same time, there is a certain predominance of the right-sided occurrence. Bilateral stones are observed in 15% of patients.

Ureterolithiasis is a multifactorial disease based on the interaction of the genotype and the external environment. The appearance of kidney stones can be caused by one, rarely several factors, when pathogenetic conditions appear that contribute to this process. And today, the identification of 8 causes and mechanisms of rock formation remains the most difficult problem of urology, there are many theories, but none of them can be considered as finally established. Nephrolithiasis is the result of many pathological processes in the body, which cause changes in the kidneys, contribute to the formation of stones. As a reason for the appearance of stones, a number of authors have attached great importance to local inflammatory changes in the mucous membrane of the urinary tract. Crystallization theory explains the principles of crystallization that formed rocks. The authors of the colloidal theory believe that the main reason for the appearance of stones is the formation of an organic matrix of the stone and the crystallization of urine salts in it is a secondary process.

According to modern data, congenital pathological changes in the kidneys - fermentopathies or tubulopathies-play an important role in impaired kidney function, low urine output and the appearance of nephrolithiasis, which is influenced by defects in the proximal and distal channels, as well as in the anatomical development of the urinary tract. The main tubulopathies that contribute to rock formation are oxaluria, uraturia, cystinuria, aminoaciduria, galactosemia, fructosemia. An important factor in stone formation is urine pH. The solubility of rock-forming salts largely depends on it, a decrease in its acidity contributes to the formation of stones. Urine is a complex solution of various mineral and organic metabolism products, toxins, hormones, toxins. Its components are dissolved and released freely. With urine alkalization, violation of the passage through the urinary tract, the stability of urinary solutions changes. Urinary stones consist of crystals of urinary salts, which are combined with the substance of various protein compounds. More than 50% of all stones are stones mixed with calcium oxalate and the calcium oxalate component.

The composition of urinary stones according to a Gubar., (2011) next: oxalate rocks - 56%, urate rocks – 19%, phosphate rocks - 8%, Cysteine rocks - 9-1%; M. D. The chemical composition of the stones also depends on the sex of the patients. Oxalates are more common in males and phosphates are more common in females. The configuration of the stones largely depends on their position and duration in the body. Endogenous etiological factors-infection, atony and damage to



the mucous membrane of the kosacha-jom system contribute to the formation of stones. Many diseases associated with metabolic disorders contribute to the development of ureterolithiasis. T. X. According to Nazarov, 16-20% of patients with gout are carriers of urate stones. Chronic inflammatory processes (pyelonephritis, glomerulonephritis) alter the renal extraction of a number of substances (calcium, citric acid, phosphates, urea, etc.), thereby altering the colloidal stability of urine and promoting the formation of stones. Urolithiasis is associated with diseases of the gastrointestinal tract, liver, biliary tract, myeloma, osteoporosis, bone metastases, Paget's disease, Beka's disease, long-term immobilization.

The clinical picture of ureterolithiasis the clinical picture of Ureterolithiasis depends on many factors: the size, number and location of stones, the duration of the disease, the one-or two-sided nature of the injury, the presence of newly appeared or recurrent stones in the patient, the inflammatory process in the kidneys, Urodynamics disorders, changes in kidney function. The main symptoms of the disease are: pain, hematuria, dysuria, piuria, excretion of urine salts and calcium crystals, obstructive anuria, fever. However, the listed simtoms, with the exception of the passage of stones, are found in many urological diseases. The leading clinical sign of ureterolithiasis is pain. Depending on the size, shape, location and mobility of the Stone, the pain can be permanent or intermittent, chronic or acute. The most characteristic manifestation of kidney stones and urinary tract is renal colic. This pain refers to a condition when suddenly, often at night, severe pain occurs in the area of the sac, which spreads along the urinary 10 pathways with radiation to the scrotum, glans penis, labia.

Renal colic is a violation of urination, most often nausea, vomiting, is observed. It is characteristic that there is no such condition in which there is less pain. In 90-95% of cases, the cause of renal colic is either urine;a stone in any part of the Li. In patients with nephrolithiasis, the frequency of the spread of stones reaches 50-90%. The causes of renal colic can be nephroptosis, where the circulation and sharp displacement of the kidney leads to a violation of its hemodynamics; thrombosis of the renal vessels; obstruction of the urinary tract with fibrin; external compression of the urinary tract with tumor or inflammatory infiltrate. The mechanism of development of renal colic is associated with a set of causes associated with acute urinary retention and increased intracranial pressure (water column up to 150 mm, about 15), impaired venous flow, impaired hemodynamics, stretching of the renal fibrosis capsule. Usually, pain irradiation is observed in renal colic. Y. G. According to Aliyev (2015), most often the pain spreads to the genitals and urethra (35.3%), then to the thigh (14.4%), lower back (12.6%), opposite side (5.6%), epigastral area (3.2%). And today, in some cases, the diagnosis of renal colic leads to great difficulties. In some patients with partially simplified stones of the Distal urinary tract, Dysuric events may prevail clinically. Such patients are often treated for a long time in clinics for cystitis, prostatitis, prostate adenoma and other diseases.

The development of urology as a surgical field largely predetermined the success of Radiology. Radiation diagnostic methods play a leading role in determining ureterolithiasis. V. K. less than a year after the X-ray X-rays were discovered-on 2 July 1896, Glasgow City Hospital physician J. An article was published by Macintyre in The Lancet, in which the author reported that for the first time he managed to determine the shade of the concrement located in the kidney using X-rays. In 1920, a. I. Gromov took an image of the urethra, into which a wire catheter was inserted. The first reports of X-ray diagnostics of ureterolithiasis in Russia were published in 1914 by P. V. Made by Glybochko. For several years, the only X-ray diagnostic method was used in urological practice: a review image, but the search for methods for studying the urinary system in conditions of artificial contrast continued. T. Knoll and T. Niemann's retrograde pyelography in 2001, J. in 2010. Carnell and E. The discovery of Cicerello 12 excretory urography was an important achievement, these methods revolutionized the diagnosis of urological diseases and put it on a clear scientific basis. The first excretory urography in the USSR was released in 2016. S. P. Fedorova at the uroselectanoma clinic . Further technical progress, improvements in X-ray diagnostic equipment and X-ray contrast medication have ensured the development of modern urological patient examination methods and X-ray semiotics of these ureterolithiasis diseases. The last quarter of the last century was marked by the introduction of new highly effective radiative diagnostic methods



into clinical practice: angiography, Sonography, radioisotope research methods, RKT and its development options - CT and MSKT, MRI, digital radiography.

Despite the introduction of modern highly effective radiative diagnostic methods into clinical practice, radiography of the urinary tract and excretory urography, according to many experts, remain the main methods of X-ray examination of patients with kidney stones and ureterolithiasis. X-ray examination of patients with clinical manifestations of ureterolithiasis should begin with X-ray of the urinary tract. In at least 40% of cases, to fulfill this requirement, you need to take an additional picture of the urethra. Urography is performed in the horizontal position of the patient and in the ventrodorsal course of the beam. V. I. Rudenko noted that it is impossible to diagnose a stone in the urinary tract (with the exception of coral stones of the kidneys), the shade in the area where the urinary tract is located can be interpreted as related to the urinary tract, but the urography should precede any X-ray contrast examination. Kidneys, urinary tract, urethra to avoid diagnostic errors. The location, shape, intensity of the shade allows us to talk about its attitude to the urinary tract. Kosacha jom stones often have an oval or triangular shape, the urinary tract is oblong, fusiform, less indistinct.

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