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ABSTRACT

Of the dissertation for the degree of Doctor of Sciences

MODERN ASPECTS OF SURGICAL TREATMENT OF BILATERAL AND MULTIPLE NEPHROLITHIASIS

Specialty: 3234.01 – Urology

Field of science: Medicine

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GENERAL DESCRIPTION OF WORK

Problem actuality. Urolithiasis (UL) being one of the actual problems of modern medicine ranks second place in the world after inflammatory diseases of the urinary tract. UL covers 30-40% of all urological diseases [1].

UL is detected at any age, but in 60-75% of cases in people of working age (35-55 years) [2].

The frequency of occurrence of urolithiasis in children in the structure of urological diseases varies between 48, 3-83,4 % . Among the elderly people (60-74 years) urolithiasis occurs in 8,8% of men and 5,6 % of women, and it remains as a serious social problem .It is no coincidence, that in the general structure of the causes of primary disability in patients with urological profile nephrolithiasis is 6,0-14,4%. Urolithiasis of the single and single functioning kidney in 7,6 % of cases leads to disability [3].

In the whole world urolithiasis has an uneven prevalence, in some places has endemic character .According to some statistics 15% of the world s population suffers from the UL. Every year 0,5-5,3% of the worlds population falls ill with UL . The incidence of UL is on average, in Asia 1-5%, in Europe 5-9% in, North America 13%, in Saudi Arabia 20% [4].

Azerbaijan is also considered an endemic hotbed with a high prevalence of the UL. Some geneological features (lack of glucose 6-phospate dehydrogenase etc.) of the population of Azerbaijan, physical, geographical and climatic conditions of the area, high continent

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[1] Лопаткин, Н.А. Урология. *Национальное руководство // Н.А. Лопаткин.- Москва: ГЭОТАР-Медиа, - 2013. - 610 с.*

[2] Turney, B. Trends in urological stone disease / B. Turney, J. Reynard, J. Noble [et al.] // BJU Int., - 2011. v. 109, no 7, - p. 1082-1087

[3] Гулиев, Б.Г. Чрезкожное удаление камней единственной почки // Экспериментальная и клиническая урология, - Москва: - 2015. № 4, - с. 21-26.

[4] Turk, C. EAU Guidelines on Interventional Treatment for Urolithiasis / C. Turk, A. Petrik, K. Sarica [et al.] // Eur Urol., - 2016. v. 69, - p. 475–482.

of minerals in the water, some structural features of the soil create real conditions for the occurrence of this disease [5].

One of the most severe forms of the UL is coral nephrolithiasis (CN). In the presence of multiple stones on the background of a coral, the term" coral and multiple nephrolithiasis" is used (CMN). A peculiar mechanism of formation, pathogenesis, the farm, diagnosis, classification, treatment features and a high recurrence rate make it possible to consider coral nephrolithiasis . The frequency of occurrence of MN in the structure UL –is 3-30%, and in the structure of all urological diseases 6-7% (In women CN is more common and it is 70,1% [1]. The treatment of CN is one of the actual problem in urology.

The high cost of modern investigations and treatment methods, the duration of the rehabilitation period and disability, the recurrence of the disease, (35-75%) lack of effectiveness of metaphylactic makes this problem even more urgent [6].

Since the 1990, the introduction of modern methods of treatment into medicine ESWL, PNLT has relatively changed the tactics of treating CN. Numerous studies show, that the use of ESWL without consider the stage of CN increases the complications rate from 25% to 39,1%. Sometimes the average duration of treatment can continue for months (171,6±43,4 days, 5,7 months) [7] [8].

In recent years, by the recommendation of the European Association of Urologists, (PNLT) is considered a universally recognized standard for minimally invasive treatment of large and coral kidney

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[5] Джавадзаде, С.М. Мочекаменная болезнь в эндемическом регионе // С.М. Джавадзаде. - Баку, - 1996. – 125 с.

[6] Adam, A. Smartphone, Smart Surgeon, what about a "Smart Logbook"? / A. Adam, K. Spencer, P. Sivsankar [et al.] // S Afr J Surg., - 2016. v. 54, - p. 569-578.

[7] Акилов, Ф.А. Послеоперационные инфекционно-восполительные осложнения эндоскопических операций по поводу уролитиаза / Ф.А. Акилов, Ш.Т. Мухтаров, Ш.А. Гиясов [и др.] // Урология, - Москва: - 2013. № 1, - с. 89-91.

[8] Burr, J. Is flexible ureterorenoscopy and laser lithotripsy the new gold standard for lower pole renal stones when compared to shock wave lithotripsy: Comparative outcomes from a University hospital over similar time period / J. Burr, H. Ishii, N. Simmonds [et al.] // Cent European J Urol., - 2015. v. 68, - p. 183-186.

stones . But, in the case of a large stone and filling by this stone not only the renal pelvic cavity but also 3\4 of the cavity of the calyx-pelvic system, the effectiveness of (PNLT) progressively decreases [4].

According A.El-Nahas and coauthors (2012), when using (PNLT) in the form of monotherapy, complete elimination of stones by one operation is possible only in 56% of patients. On the other hand, in complex forms of UL operations were accompanied by some complications [9].

Studies show that when applying the (PNLT) in the treatment of CN, the frequency of complications is-36,4%. These include complications such as bleeding (intra-operative and in the postoperative period) 5-10% damage to neighboring organs (pneumo, hemo-and urotorax) 4-8%, exacerbation of the inflammatory process, development of shock and prolapsed of the nephrostomy tube [10].

There is also little information in the foreign literature about percutaneous removal of stones a single and single-functioning kidney[11].

According to endourologist of the world, out of 5803 patients., who underwent (PNLT) only 3,3% were patients with a single and single - functioning kidney [4].

It is no coincidence, that the ongoing discussions about the optimal methods for removing coral stones, do not allow the EUA to recommend any specific method and completely refuse from open operations (one of them is ano-trophic nephrolithotomy AN [4].

During the discussion of the issue of surgical treatment of CN, it is necessary to pay attention on 2 aspects: the choice of a method for removing the stone a possible complications of this intervention.

On the one hand (PNLT) is the method of choice for kidney

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[9] Nahas, A.R. Acute kidney injury after percutaneous nephrolithotomy for stones in solitary kidneys / A.R. Nahas, D.E. Taha, H.M. Ali [et al.] // Scand J Urol., - 2017. v. 29, - p. 1–5.

[10] Алексеев, М.Ю. Предупреждение и лечение осложнений перкутанной нефролитотрипсии: / автореферат диссертации кандидата медицинских наук) / - СПб., 2012. - 26 с.

[11] Wong, K. Is percutaneous nephrolithotomy in solitary kidneys safe? / K. Wong, A. Sahai, A. Patel [et al.] // Urology, - 2013. v. 82, - p. 1013-1016.

stones larger than 20 mm, and on the other hand, with an increase in the size of the stone, the effectiveness of the operation progressively decreases [4].

A decrease in the rate of " stone -free state ", notes the traditional increase in intra-and postoperative complications up to 56% during (PNLT) dueto CN [9].

Thus, studies show that in case of CN, percutaneous operations are associated with complications of a relatively high risk In developed countries, open operations still make up at least 5% of all interventions performed for urolithiasis . All of these do not allow categorically to abandon open operations, which demonstrate high rates of a "stone- free state" in this disease [4 12].

In this regard, open surgery remains the main and irreplaceable method of treating nephrolithiasis, accompanied by multiple secondary complications .

On the other hand, blocked calyx pelvis systems, nephrolithiasis of complex form with large branches into calyces, acute purulent inflammatory complications, abnormalities of the kidney and upper urinary tract, various intercurrent diseases, require the use of open surgical treatment, and the two-sidedness of the process complicates the solution of the problem. The above proves once again that treatment of CMN remains an actual problem .

Object and subject of research. The object of the study was 250 patients with bilateral CMN. Patients were between 7-70 years old . Of them children 7-18 years old (average age 14,2), adult (18-70) years old (average age 46,4±0,7). 120 (48,4 ± 3,2 %) patients of them were male patients, 130 (51,6± 3,2%) were female.

The subject of the study was the methods of treatment, used in open surgical treatment in 250 patients with purpose to futile the set goal and tasks.

The purpose of the study: increasing the effectiveness of open surgical treatment of patients with bilateral CMN, choosing rational

[12] Voilette, P. Standardizing the reporting of percutaneous nephrolithotomy complications / P. Voilette, J. Denstedt // Indian J Urol., - 2014. v. 30, no 1, - p. 84-91.

treatment tactics and applying metaphylactic measures, based on a comparative analysis of open surgical and modern methods of treatment.

Research tasks:

1. Clinical assessment of patients by groups, considering the peculiarities of changes in the kidneys and upper urinary tract, to choose a more rational tactics of treatment for bilateral CMN.

2. Determining the perspective of surgery for CMN, studying the relations ship of functional disorders of the kidneys with their anatomical changes, based on modern research methods.

3. Determining the degree of reliability of less invasive research methods that reveal the potential of kidneys, as well as the effectiveness of efferent methods of detoxication before surgery in bilateral CMN, complicated by chronic renal failure (CFR)

4. Development of a treatment algorithm for individual groups of patients with bilateral CMN for their open surgical treatment.

5. The use of less invasive antiishemic protection and achieving a decrease the time of ishemia, if it necessary to clamp the renal artery during open surgical treatment of bilateral CMN.

6. To study the results of stone extraction in different groups of patients, who underwent surgery due to CMN in both kidneys, according to «stone free rate» indicators.

7. Studying the immediate and long term results of methods of open surgical treatment of bilateral CMN, as well the mineralogical composition of urinary stones determining the causes of the risk of its recurrence and developing methods of metaphylactic measures.

Research methods. Research methods meant the methods used to achieve the goal of scientific work implied the methods used to achieve the goal of scientific work, for achievement the results of objective (srvey, examination, palpation, percussion, auscultation), laboratory (general blood test, general and special urine analysis biochemical analysis), instrumental (endoscopic, radiological, ultrasonography) research methods were studied in 250 patients with bilateral CMN.

The main theses of dissertation:

– Bilateral CMN is one of the most severe and complex forms of urolithiasis and in all cases is accompanied by multiple secondary complications

– Dividing the patients with bilateral CMN by groups, considering the changes in both kidneys and ureters, dictates the tactics of their surgical treatment (open and closed)

– In CMN with multiple secondary complications, open surgical treatment is the only encouraging method of treatment and the use of modern methods of treatment with it does not give the desired results.

– The effectiveness of open surgery for CMN is higher and they can be used in all cases.

– Antiishemic protection during anatrrophic subcortical pyelocalicotomy and nephrolitomy, which is used in open surgery of bilateral CMN, significantly increases the efficiency of operations.

– Posterior subcortical piyelolitotomy, nephrolithotomy and their combination are the methods of choice for open surgical treatment of bilateral CMN at the same time, refusing from sectional nephrotomy, the appropriate place for transverse nephrotomy on the anterior and posterior surfaces of any part of the kidney, considering the peculiarities of its blood circulation.

Scientific novelty:

– A new clinical classification of bilateral CMN was presented, and on the basis of this classification was developed an algorithm for optimal open and combined methods of treatment, minimally negatively affecting on the functional state of the kidneys in this group of severe patients, with multiple secondary complications.

– Developed and applied a new method of anti –ischemic protection of the kidney in case of renal artery clamping, and as a result, an increase of the efficiency of open surgical operations and an improvement of kidney function has been achieved.

– A rational method of posterior pyelocalicotomy in open surgical treatment of severe forms of CMN was proposed and applied in clinical practice.

– A plan of preventive and metaphylactic measures was developed by studying the etio-pathogenesis of the most common complications before and after treatment of bilateral CMN.

Practical value of scientific work. According to the results of the study, systemic surgical treatment of a group severe patients, suffering from CMN was provided. For the first time, a classification was presented according to changes in both kidneys and ureters in this group of patients, and on the basis of this classification a treatment algorithm was developed.

İn addition, improved methods of open surgical treatment of one of the complex forms of urolithiasis, such as CMN. Methods of anti - ischemic protection of the kidney have been developed if it is necessary to clamp the renal artery during the surgical treatment of SMN, and as well as metaphylactic measures to prevent recurrence of stone formation. All this significantly increased the practical value of the research and expanded its application in practice.

Application of research results. The results of the study were successfully applied in the urological departments at the Republican clinical hospital named after akad. Mir-Kasimov M.A., the central hospital of seamen., the central clinical hospital of thaw ministry of internal affairs, the central railway hospital, and as well as in private clinics of Baku city. The basics of the research are included in the plan of practical classes for students of the Azerbaijan Medical University, which served as a comprehensive study of the tactics of treating one of the complex forms of urolithiasis, such as CMN.

The connection of research with the plan of problems of medical science. Dissertation Work Is Included In The Plan Of Scientific Work Of The Urology Department Of Azerbaijan Medical University (State Registration 01114058)

Approbation of scientific works. The Main Theses Of Dissertation Are Presentez On The XI Republican Scientefic Conference Of Doctorants And Young Researchers (Baku 2010), On Medical Congress Of Turkish –Speaking Countries And Turkish Kommunities (Baku 2011), On The VI Simposium Of Azerbaijan Andrologists, Dedicated to Andrological And Childrens Urological Surgical Dis-

eases (Baku 2011), on the VI simposium of association of urologits and andrologists of Azerbaijan (Qabala 2012), on V international scientific conference by the topic., basic and applied research in medicine (Sochi 2012) Azerbaijan urolojik cerrahide kadavra diseksion kuesu ve sempoziumunda (Baku 2012). “Third meeting of the eau section of urolitiasis” (EULİS) 2013 Copenhagen,Denmark, 5-7 september. IX simpozium of association of urologists and andrologists Azerbaijan (Gabala 2015), On Conference Third Meeting Of “The EAU Section Of Urolitiasis (EULİS) 10-12 Semprembe 2015, Alikante Spain. On X Simpozium Of Association Of Urologits And Andrologists Of Azerbaijan (Gabala 2016), At the international scientific and practical conference, Tambov, 2020 (online)

The unital discussion of the dissertation was carried out at a joint meting of the urology, Surgical diseases III, Obstetrics and Gynecology II departments of Azerbaijan Medical University (protocol №10 12.03.2019)

Approbation of the work was held at a meeting of the approbation council, on conducting a scientific seminar at the dissertation council ED2.6 of Azerbaijan Medical University specializing in Urology-3234.01(protocol №10 29.04.2021)

Published articles. On the topic of the dissertation have been published 50 scientific works: 36 scientific articles (27 in domestic and 9 in foreign press), 13 theses in conferences materials (10 in domestic and 3 in foreign press) 1 methodical allowance.

Volume and structure of dissertation work. The dissertation work is printed on a computer, consists of 301 pages (386.300 characters) and includes an introduction (13.500), a literature review (46.800 işarə), 5 chapters covering the study of clinical observations, research methods, methods of treatment and personal observations (33.000 + 93.800 + 92.300 + 34.500 + 29.500), conclusions inferences and practical recommendation (42.900). Research work is illustrated with 27 tables, 8 graphics and 67 figures. the list of literature includes 327 foreign and 21 domestic sources.

GENERAL CHARACTERICS OF CLINICAL MATERIAL AND RESEARCH METHODS

The clinical part of the study covers the observation of 250 operated patients in separate groups, in the period 2000-2016. According to our data, during this period the total number of patients whom we operated on for urological diseases was 6350 people. Of these 2080(32,8%) patients underwent surgery for kidney and ureteral stones.

By the shape of the stone 1350 (64,4%) patients were diagnosed with a solitary single or multiple) stone of the kidney and ureter, and 748 ()35,5%) patients .Our research shows that the frequency of occurrence of ul in the structure of all urological diseases is 32,4% and in the structure of ul the frequency of occurrence of unilateral CN was 23,3% and bilateral 12,2%

The formation of kidney stones can be simultaneously on both sides, as well as on different sides, and at different times . But according to research, the stone is formed primarily in the kidney with the most impaired function. In some cases, the process can always be unilateral . If metabolic disorders continue and changes in the opposite kidney gradually progress, the formation of stones in both kidneys becomes inevitable considering all of the above, we propesed a classification for bilsateral CN, according to the features of changes in both kidneys and ureters

According to this classification, the patients studies by us are combined in 4 groups. In all these patients, research, treatment and metaphylaxis are carried out, as in bilateral CN

The first group includes patients with bilateral CN.

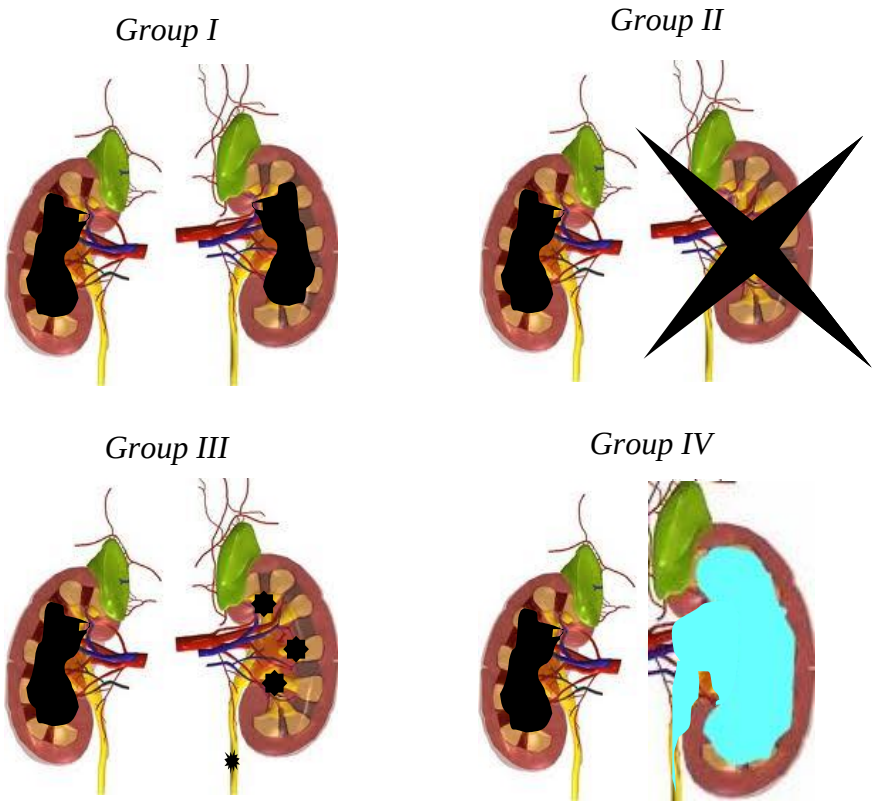
The second group includes patients with CMN of single or single functioning kidney.

The third group includes patients with CMN one side, and single or multiple destones of the kidney or ureter on the opposite side.

The fourth group includes patients with CMN on one side, and hydronephrosis of non –calculi etiology on the other side.

A feature of the patients of the last group is that they need ne-

phrectomy or recon strictive surgery for hydronephrosis of non – colculi etilolgy. In some cases, we simultaneously performed organ – preserving surgery on one side and nephrectomy on the other side. Such decision dictates the general condition of the patient (figure 1)



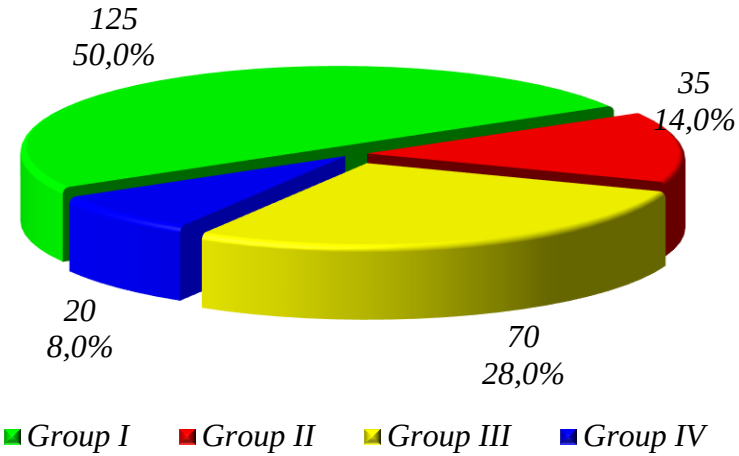
Fiqure1.The classification bilateral CMN according to the features in both kidneys and ureters (Imamverdiyev S.B, Talibov T.A.2008).

In general, in all patients of these groups, the tactics of treatment and prevention are carried out as in bilateral CN.

According to our proposed classification due to the peculiarites

of changes in both kidneys and ureters, patients with CMN are grouped as follows. According to this classification, the first group includes 125, the second -35, the third 70,the fourth 20 patients.

The age of the patients was 7-70 years old, children 7-18(average age 14,2) adults 18-70 (average age 46,4±0,7) years old. The average age in the first group was -44,8 in second -48,6 in third 44,5 in fourth 46,4 in general 46,4± 0,7(graphic 1).



Graphic 1. İnvestigated contingent.

Of the patients 120 men, 130 women. Studies show that bilateral CMN occurs more often in women than in men.

Most often observed at the age 41-50 years both in men and women.

In patients whom we observed, the stage of CN was determined according to the generally occepted classification, by shape and size. According to this classification.K_1-claculs fills the renal pelvis and one group of (CPS) calyces K2–calculs fills calyx-pelvis system by extrarenal type, K_3 calculs fills CPS by intra K_4 calculs fill a total dilated CPS (tabl. 1).

From the table it follows that in all groups, patients were admitted to the hospital, mainly with the second stage (K2) of the disease.

Table 1
Stage CMN by groups

Stage CMN	I group (n=125)		II group (n=35)		III group (n=70)		IV group (n=20)		Total	
	right	left	right	left	right	left	right	left	right	left
I stage K_1	25 20,0%	35 28,0%	5 14,3%	6 17,1%	8 11,4%	8 11,4%	2 10,0%	2 10,0%	40 16,0%	51 20,4%
II stage K_2	50 40,0%	65 52,0%	8 22,9%	3 8,6%	10 14,3%	8 11,4%	5 25,0%	2 10,0%	73 29,2%	78 31,2%
III stage K_3	35 28,0%	20 16,0%	5 14,3%	2 5,7%	12 17,1%	14 20,0%	3 15,0%	3 15,0%	55 22,0%	39 15,6%
IV stage K_4	15 12,0%	5 4,0%	4 11,4%	2 5,7%	6 8,6%	4 5,7%	1 5,0%	2 10,0%	26 10,4%	13 5,2%

A coral stone (CS) at the first stage was diagnosed in 40 (16± 2,3%) patients on the right side, in 51(20,4± 2,5%) on the left side, at the second stage in 73(29,2± 2,9%), on the right side, and in 78(31,2 ±2,9%) on the left side, at the third stage in 55(22,0±2,6%) on the right side, in 39(15,6±3,3 %) on the left side, at the fourth stage in 26(10, 4± 1,9%) on the right side in 13(5,2± 1,4%) on the left side.

It should be noted that the complexity and duration of the operation for CMN requires special attention. Detection of all stones located in different groups (upper middle and lower) of the calyces during the operation, creates certain difficulties.

Removing stones from small calyces through the pelvis is consider a difficult problem. Narrow and scarred isthmuses of the calyces do not allow removing stones from their cavities relatively large in size through the pelvis, because a violent attempt can cause severe bleeding and seriously complicate the course of the operation. Considering all of above, the analysis of clinical material by groups for CN and CMN was carried out separately. The following table shows the number of patients with CN and CMN by individual groups (table 2).

Thus, among the observed patients, (CS) was detected in 194(77,6%) patients on the right side, in 181(72,4%) patients on the

left side. Among 194 (77,6%) patients with right-sided process, in 73 (37,6±3,5%) determined CN, in 121 (62,4±3,5%) patients CMN. Among 181 patients with left sided process in 54 (29±3,4%) patients CN, 127 (70,2±3,4%) patients CMN.

Table 2
The number of patients with CN and CMN by frequency of occurrence

Sex	I group (n=125)				II group (n=35)				III group (n=70)				IV group (n=20)			
	MN		MÇN		MN		MÇN		MN		MÇN		MN		MÇN	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
Men	25	21	36	40	5	1	7	8	4	4	11	12	3	1	2	2
Women	24	13	40	51	3	3	7	1	8	9	13	9	1	2	5	4
Total	49	34	76	91	8	4	14	9	12	13	24	21	4	3	7	6
	83 * 33,2%		167 * 66,8%		12 34,3%		23 65,7%		25 35,7%		45 64,3%		7 35,0%		13 65,0%	

Note: R – right; L – Left
* In the first group the percentages are calculated from the total number of kidneys.

Stones of the single or single functioning kidney had different localization.in 22(62, 9± 8,2%) patients, the stone was in right kidney, in 13 (37,5±82%) patients was in left kidney as well in 20 (57,5±8,4%) in remaining after nephrectomy, in 2 (5,7±3,9%) patients in congenitally-single in 13 (37,5±8,2%) patients in single functioning kidney.

Among 20 (57,5±8,4%) patients with CMN of single kidney, in 19(54,3±8,4%) patients the contralateral kidney was removed done to CMN, in different times and in different clinics. Only in 1 (2,9±2,8%) patient nephrostomy performed 1n 1969 year due to tuberculosis. Among these patients in 11 (31,4±7,8%) at the time of nephrectomy de to CMN, there were no stones in the remaining kidney.

Treatment of patients with CN of a single kidney should be carued out, as with bilateral CN/ In 13 (37,4± 8,2%) patients identified a stone of the single functioning kidney and complete loss of contralateral kidney function (autonefrectomy). Of them, in 3 (8,6%) patients the contralateral kidney removed on the second stage, due to symptomatic hypertension.

In patients divided into groups, CMN was accompanied by stones of the kidney an ureter of one or the other side.

In the first group, CMN was accompanied in 9 (7,2±2,3%) patients by stone of the right, in 4 (3,2± 1,6%) patients of the left ureter.

In the second group among 35 patients in 7 (20%) CMN was accompanied by stone of the right, in 2 (5,7%) patients of the left ureter. In third group, in 11 (15,7± 4,3%) patients diagnosed with CN of the right kidney and a stone of of the left ureter. In patents of the last group, in 9 (12,9±4,0) the stone was in the lower 1\3 in 2 (2,9 ± 2,0%) in the upper 1\3 of the ureter.

In all 6(8,6 ±3,3%) patients with CN of the left kidney and the stone of the right ureter, as well in 7 (8,6 ± 3,3 %) with CMN of the left kidney and the stone of the right ureter, the stone was in lover 1\3 of the ureter. It should be noted, that in the third group in 1 (1,4 ±1,4%) patient, CMN of the left kidney was accompanied by a stone of the right kidney and bladder, in another patient by stone of the right ureter and bladder. In fourth group in 2(10,0 ± 6,7%) patients CMN accompanied by a stone of the ureter of one or the other side. Of them, in addition to CMN, one patient had o stone in the right, anoze in the left ureter.

The observed patients had some accompanying diseases and numerous secondary complications (table 3).

According to our studies CMN was accompanied net only by several concomitant diseases, but also by humorous secondary complications (table 4).

Thus all 250 patients had calculous pyelonephritis. In 100 (80,0± 3,6%) patients of first group, in 24 (68,6±7,8%) patients of second group, in55 (78,6 ±4,9%) of third group, in 15 (75,0±9,7%) of fourth

group, total in 194 (77,6 ± 2,6%) calculous pyelonephritis had chronic form, and in 25 (20,0±3,6%) patients of first group, in 11 (31,4±7,8%) patients of second group, in 15 (21,4±4,9%) of third group, in 5 (22,4±2,6%) of fourth group, total in 56 (22,4±2,6%) had acute form . In addition, among the observed patient, 79(31,6±2,6%) had chronic paranephritis, 101(40,4±3,1%) had chronic pedunculitis, 12(4,8 ±1,4 %) patients had tastaceos paranephritis.

In general, in 209 (83,6±2,3%) patients out of 250 was calculous hydronephrotic transformation. Of these patients in 5 (2,0±0,9%), in addition to the stone the (PUS) conflict was revealed. In 4 (1,5±0,8%) patient out of the last 5, (PUS) conflict was on the right side, in 1 (0,4±0,4%) on the left side.

Table 3
Accompanying diseases

Accompanying diseases	I group (n=125)	II group (n=35)	III group (n=70)	IV group (n=20)	Total n=250
Cardiac ischemia disease	26 20,8%	6 17,1%	9 12,9%	3 15,0%	44 17,6%
Atherosclerotic cardiosclerosis	10 8,0%	6 17,1%	12 17,1%	12 * 60,0%	40 16,0%
Hypertonic disease	36 28,8%	8 22,9%	12 17,1%	6 30,0%	62 24,8%
Diabetes mellitus	26 20,8%	4 11,4%	16 22,9%	4 20,0%	50 20,0%
Gastrointestinal trad disease	28 22,4%	10 28,6%	22 31,4%	3 15,0%	48 19,2%
Solitary kidney cyst	4 3,2%	2 5,7%	2 2,9%	–	8 3,2%
Polycystic	–	–	1 1,4%	–	1 0,4%
Nephroptotic	14 11,2%	1 2,9%	3 4,3%	2 10,0%	20 8,0%
Bekhterev disease	–	1 2,9%	–	–	1 0,4%

Note: * – Statistically reliably differs from the indicator of the other group ($p<0,01$-$0,001$).

Table 4
Secondary complications

Secondary complications	I group (n=125)	II group (n=35)	III group (n=70)	IV group (n=20)	Total n=250
Chronic pyelonephritis	100 80,0%	24 68,6%	55 78,6%	15 75,0%	194 77,6%
Acute pyelonephritis	25 20,0%	11 31,4%	15 21,4%	5 25,0%	56 22,4%
Kidney abscess	4 3,2%	–	–	–	4 1,6%
Chronic paranephritis	38 30,4%	9 25,7%	21 30,0%	11 55,0%	79 31,6%
Tastaceos paranephritis	8 6,4%	2 5,7%	1 1,4%	1 5,0%	12 4,8%
Pedunculitis	42 33,6%	21 * 60,0%	24 34,3%	14 * 70,0%	101 40,4%
Calculous hydronephrotic trans-formation	110 88,0%	29 82,9%	50 71,4%	20 100%	209 83,6%
Ureterohydronephrosis	8 6,4%	4 11,4%	27 38,6%	2 10,0%	41 16,4%
Pyonephrosis	8 6,4%	1 2,9%	2 2,9%	2 10,0%	13 5,2%
Chronic renal failure	108 * 86,4%	18 51,4%	19 27,1%	9 45,0%	154 61,6%
Anuria	7 5,6%	15 42,9%	2 2,9%	–	24 9,6%
Toxic anemia	36 28,8%	20 * 57,1%	14 20,0%	7 35,0%	77 30,8%

Note: * Statistically reliably differs from the indicator of the other group ($p<0,05$-$0,001$)

Out of 42(16,8±2,4%) patients with bilateral hydronephrotic transformation, in 20 (8,0 ±1,7%) patients on one side, it was of non –calculi etiology.

Out of patients with hydronephrotic transformation, in 41 (16,4±2,3%) patients was ureterohydronephrosis, in 13(5,2±1,4%) was pyonephrosis. Out of the last, in 8 (3,2 ± 1,1%) patients pyo-

nephrosis was on the right side, in 5 (2,0 ± 0,9%) on the left side. In most cases, pyonephrosis was observed in patients who have been suffering from urolithiasis for a long time . In the observed patients, CMN was diagnosed according to generally accepted principles. It was based on anamnesis data, clinical signs, laboratory, instrumental and other examination methods.

Despite the absence of pronounced symptoms in patients with CMN, their clinical picture was varied.

In some patients, the disease was asymptomatic sometimes the presence of CN in the kidney was discovered accidentally, during examination. But an asymptomatic course was not a satisfactory indicator. Due to the absence But our observations have shown that in presence of small stones, except coral, renal colic is inevitable.

Out of the studied patients, in 65 (26,0± 2,8 %) was the colic pain in 161 (64,4 ± 3,0%) was the dull pain. In most patients, colic was accompanied by an increase of body temperature. This symptom was observed in 105 (42,0 ± 3,0 %) patients. Of them, in 56 (22,4± 2,6 %) patients body temperature increased on the background of renal colic. As a result of the treatment, in most patients the body temperature returned to normal values, and the pain subsided/ Of the observed 90 patents hematuria was noted. Of them, in 77 (30,2 ±2,9%) patients was microhematuria, in 13 (5,2±1,4%) macrohematuria.

One of the most common symptoms is dysuria. This symptom was mainly found in colic and was noted in 66 (26,4±2,8%) patients.

In addition, 92 (36,8±3,1%) patients had dry mouth, 125 (50,0±3,2%) nausea. Constant thirst, was considered as a manifestation of several renal dysfunction and severe condition of patients. It should be noted that in nephrolithiasis, there are no any serious changes in the blood, specific to it. Changes in the blood in CN are observed when it is complicated by renal failure and purulent - septic processes. There is leykocytosis, a shift of WBC count to the left, increase of ESR.

The number of WBS in the observed 152 (60,8±3,1%) patients, was with in normal values. An increase in the number of WBS up to 10000 vas observed in 50 patients, up to 12000 in 22 patients above

12000 in 24 patients ESR index was within normal values (15mm\ h) in 96 patients, increased up to 16-30mm\h in 80 (32,0 ± 3.0%) patients. above 30 mm\h in 74(29,6 ±2,9%) patients . In this group of patients, on the background of prolonged intoxication, the level of hemoglobin and the number of RBC decreased, anemia developed. In general anemia was noted in 77 (30,8±2,8%) patients, of them 37 (14,8%) men 40 (16/0%) women. 34(13,6±2,2%) patients with anemia received blood transfusion before surgery. In the patients, the lowest rate of hemoglobin was 61 q\l, the highest -100 q\l, on average 76±1,6 q\l. Blood was transfused to 20(8,0 ±1,7%) patients once, to 1(0,4±0,4%) patient twice, to 9 (3,6±1,2%) three times, to 4(1,6±0,8%) patients four times. 18(7,2 ±1,6%) patients received blood transfusion during hemodialysis. It should be noted that during the examination, 50 (20,0±2,5%) patients were diagnosed with diabetes mellitus. In this group, the highest blood sugar level was 30 mm\l, and the average was 12mm/h. Microscopic urine examination is of particular importance in CMN. During microscopy of urine in studied patients, 205 (82,0 ±22,4 %) had leykocyturia, 203(81,2 ±2,5) had salt cristalis. Of team in 92 (36,8±3,1 %) patients was triple phosphate crystals, in 68(27,2± 2.8%) urate, in 43(5,2±2,4%) oxalate salts.

With UL, the urine reaction is important. According to our research, with aseptic kidney stones the urine reaction was mainly acidic and neutral, with infected stones- alkaline. Only when the stones were infected by Escherichia coli, the urine had an acidic reaction. Of the studied patients, in 96 (38,4 ± 3,1%) patients the urine reaction was acidic, in 111(44,4±3,1%) patients was alkaline, in18 ((7,2 ± 1,6 %) neutral. Out of 205 (86,0 ± 2,2 %) studied patients, protein was found in the urine. Of these, in 195 (78,0±2,5 %) patients the level of protein in the urine was 0,03- 0,3% in 20 (8,0±1,7%) above 1%. The increase of the level of protein in the urine was caused by pyuria and hematuria.

The specific weight of urine is one of the main indicators of the functional state of the kidneys. Determination of the specific weight of urine is a simple but very informative study. In case of impaired

renal function, the specific weight of urine decreases, accompanied by polyuria.

In 72 (28,8±2,9%) observed patients the specific weight of urine was normal, and in 164 (65,6±3,0) it varied within 1008-1012.

Of these, in 22(8,8±1,8%) patients, the specific weight of urine was significantly reduced (less 1007). This means that with bilateral CMN, the concentration and filtration function of the kidneys is impaired to varying of the degrees. Out of 250 observed, 178 patients (97 men and 81 women) had renal failure. Renal failure in 154 (61,6±3,4%) patients was chronic, of these (80 men and 74 women), in 24 (9,6±1,9%) patients was a cute (17 men, 7 women).

Chronic renal failure divided into stages, according to the classification of Lopatkin N.A and Kuchinsky I.N (1972) and is presented in the following table (table 5).

Table 5

Distribution of patients, according to the stage of renal failure

Stage of the disease	I group (n=125)		II group (n=35)		III group (n=70)		IV group (n=20)		Total (n=250)	
	M	W	M	W	M	W	M	W	Men	Women
Chronic renal failure	55	53	11	7	9	10	5	4	80 32,0%	74 29,6%
Latent	25	19	1	1	2	3	1	2	29 11,6%	25 10,0%
Compensated	10	12	2	2	2	3	2	1	16 6,4%	18 7,2%
İntermittent	18	20	4	3	3	4	2	1	27 10,8%	28 11,2%
Terminal	2	2	4	1	2	–	–	–	8 2,8%	3 1,2%
Total	108 * 86,4%		18 51,4%		19 27,1%		9 45,0%		154 61,6%	
Acute renal failure	4	3	11	4	2	–	–	–	17 6,8%	7 2,8%
Total	7 5,6%		15 * 42,9%		2 2,9%		–		24 9,6%	

Note: Statistically reliably differs from the indicators of the other group ($p<0,001$)

There were 54 (21,6±2,6%) patients at the latent stage at this stage the general condition of the patient was normal and the ability to work remained. There were some disorders of urination, a decrease in urine concentration, equaliration of the amount of day and night urine. The contest of creatinine and urea in the blood remained normal.

At the compensated stage there were 34 (13,6±2,2%) patients at this stage the patients had general weakness, malaise, headaches. The specific weight of urine varied between 1014-1016. Due to a decrease of tubular reabsorption, diurnal urine excretion increased up to 2,5 liter.

At the intermittent stage there were 55 (27,0±2,6%) patients. At this stage, patients had expressed violation of renal function.

There where 11(4,4±1,3%) patients had a very serious impairment of renal function.

In addition to secondary acute pyelonephritis, excretory anuria was noted in 7(5,6±2,1%) patients of the first group, in 15 (42,9±8,4%) patients of second group, and in 2 (2,9±2%) patients of the third group. Most of these patients were admitted to our hospital in an extremely severe condition, with acute intoxication and azotemia.

Considering, that the main method of treatment of the studied patients was surgical, the results of diagnostic methods used in them, were studied taking into account their prognostic values. In this aspect, in the diagnosis the main role was played by ultrasonography and other radiological examine methods, due to their availability and informativeness.

With UL, including CMN, using Ultrasonography obtained data about kidney size, the condition of calyx-pelvis system, thickness of the parenchyma, on its symmetric or asymmetric increase and roughness of the contours.

It was found that if in patient during ultrasonography even over a coral stone (CS) in the all kidney a parenchyma is determined, the total volume has not increased or there is a slight increase and there is no expansion in the CPS, the existing hyperazotemia indicates by

fatty degeneration, wrinkling and loss of potential functional capabilities of renal tissue.

According to the results of ultrasound, although it was possible to talk about certain changes in the kidney and (CPS), it was impossible to determine the degree of preservation in parenchyma, except in cases of expressed pathological changes in the kidney. A sharp expansion of the (CPS) and uneven thinning of the renal parenchyma in several areas according to the results of ultrasound, convincingly testifies to the irreversibility of renal changes. The normal size of kidney or its slight increase with the preservation of thickness the parenchyma some expansion of the (CPS) are convincing, regarding the preservation of the parenchyma, what was confirmed during the operation. In patients with secondary complications, including CRF, on the background of bilateral CMN, the detection of gross changes in the renal parenchyma during ultrasonography, predetermined the necessity to conduct infusion excretory urography (EU)

According to the above, it can be concluded that in CMN, complicated by chronic renal failure in order to determine the potential functional capabilities of the kidneys by the degree of preservation of the parenchyma thickness preference can be given to ultrasound investigation. Due to the high content of creatinine and urea in the blood of these patients, it was considered inappropriate to conduct excretory urography. In additional ultrasound investigation could determine a relatively more intact parenchyma in bilateral kidney stones. There indicators helped in choosing a side for surgery in patients with significant damage to the kidney parenchyma, on both sides. In such cases the operation on the kidney with the most expanded (CPS) can be considered promising. In cases of detection of a mute kidney in a patient during excretory urography, the results of ultrasound examination acquire of particular value. Thus, in the diagnosis of CMN, ultrasonography and EU complemented each other.

Considering the role of parathyroid hormone in the etiology of CMN, ultrasonography of the thyroid and parathyroid glands was performed in 62(24,8%) patients. Of these, 4(1,6+0,8%) patients had goiter, 12(4,8+1,4%) had unexpressed diffuse changes. In none of the

observed patients there were serious changes in the parathyroid glands, requiring surgical treatment.

Addition, for studying the blood circulation in the kidney with CMN 35(14,0%), patients underwent a Doppler ultrasonography before the operation

It is known that in the diagnosis of UL, including CMN, X-Ray investigation methods play an exceptional role.

Out of 250 observed patients, 194(77,6%) underwent EU. X-Ray, examination due to UL begins with an plain urography. On the plain X-Ray, the coral stone CS gives mainly intense shadow.

In 166(66,4+3,0%) patients on the plain urogram, an intense shadow on the CS was revealed and in 62(24,8+2,7%) patients weakly intense shadow. X-Ray negative stone was noted in 22(8,8+1,8%) patients, on plain urography. Thus, in most cases, plain urography allows to determine the presence of a CS in the kidney, its size, shape and localization. For studying the anatomical and functional condition of the kidneys and urinary tract, the shape of the pelvis (intrarenal, extrarenal) localization of the stone (in the pelvis, in the calyx, in the urether), a direct indication is excretory urography (EU)/ANURIA

During EU, 40 me of a radiopaque substance, containing 3-iodine atoms in a molecule, at a concentration of 60-76%, was injected into a vein. Patient with iso-and hypostenuria underwent infusion (by twice diluted contrast agent) urography. The first snapshot is taken at 15 minutes. If a contrast substance is released in CPS, subsequently, according to its intensity, snapshots are taken at 45, 60, 120, 180 minutes. The absence of contrast within 3 hours (except in cases of acute obstruction), indicates the lack of prospects of the kidney. With the help of urography, it is possible to identify a stone (an X-Ray negative stone in the form of a filling defect) as well an expansion of the kidney cavity the condition of the CPS as a whole and the calyces separately, changes in the kidneys and perirenal structures (hydronephrosis, pedunculitis, paranephritis). Another advantage of EU is that it allows simultaneously to study the anatomical and functional condition of both kidneys.

With X-Ray negative stones on the background of a radiopaque substance, filling defects are visible, corresponding to calculi.

In patients with CMN, retrograde ureteropyelography was performed very rarely.

According to strict indications and directly before surgery. We performed retrograde ureteropyelography in 18(7,2%) patients with CN. For patients with arotemia, a single kidney stone, especially with anuria, this study is important. It was proved that the study of the groups (anterior and posterior) of the calyces and the degree of their filling with stones is the main informative moment for planning organ-preserving surgery in case of CMN. Unfortunately, neither ultrasonography nor EU give complete information about this. In this regard, computed tomography (CT-scan), especially spiral CT-scan, is considered as a prospective examination in the diagnosis of CMN. It allows to identify small stones in the anterior and posterior calyces their relationship with CS and what is very important to determine tactics during surgery. It should be noted that in addition to the informative value of the examination the surgeon's experience plays a vital role. Also, the X-Ray television equipment in the operating room is important.

All observed patients underwent open surgical treatment after preoperative preparation. Surgical treatment in individual groups was carried out according to our proposed algorithm.

Conducting in patients of the first group staged treatment, in the second group in most cases of urgent treatment, in the third group staged and one-stage open surgical treatment on both sides, or open surgical treatment on one side, YPC-onepayau or RSWL on the other side and in the fourth group mainly of staged treatment gives better results. A feature of 4 group is that in most cases, hydronephrosis of 4 stage in this group requires mandatory surgical treatment. In some cases, organ preserving surgery on the one hand, and nephrectomy on the other, we performed simultaneously. Such decision is made taking into account the general condition of the patient.

DISCUSSION OF THE STUDY

Open surgical treatment of bilateral CMN has some features. The following, remained controversial untie recent years:

Accompaniment of the operation with psychological stress.

Selection of the renal side for surgery.

Type of operation.

In all cases minor trauma of the operation.

The most important is bloodless operation.

With bilateral CMN, as well CMS of the single-functioning kidney, the patient and doctor face a serious threat, regardless of the choice of treatment method.

The chosen surgical tactics during the operation, should be less invasive and, most importantly, the intervention should be carried out bloodlessly with that in mind, and with the aim of preserving the kidney, surgery for bilateral CMN, has a high psychological load.

It should be considered, that the chosen surgical tactics for bilateral CMN, in any case, should end with the preservation of the kidney. Often the doctors fearing bleeding and other serious consequences when removing these stones refrain from surgery and redirect patients to conservative treatment. Waiting tactics in patients with bilateral CMN leads to deterioration of their condition.

That is, an operation for bilateral CMN should be performed before the development of irreversible changes in the kidneys.

Abandonment of the operation in this group of patients leads to exhausting and inevitable death. Particular importance is the correct choice of indicators for surgery and the side of its implementation. In patients with bilateral CMN.

There are some controversial options about this in the literature our research shows that the choice of kidney for surgery does not depends from the sire and shape of the stone.

The results of our study allows to conclude that the main condition of treatment for bilateral CMN is its staged implementation.

First of all, the most restless side of the patient is operated on. If there are no fundamental differences in the patient's complaints and

then rely on functional indicators of kidneys the side of the kidney with the most intact parenchyma is selected for the operation.

In addition to the main question about the initial operation, the second controversial issue in CMN is the choice of the type of operation. Studies show that the type of surgical intervention for bilateral CMN, selects individually, taking into account the sire and location of stones, the state of the renal pyelocaliceal system parenchyma thickness, the presence of upper urinary tract abnormalities, as well as the stage of the disease.

Despite the changing surgical tactics in the treatment of bilateral CMN, one rule remains unchanged, that removing a stone from a kidney does not relieve the patient of the disease. Therefore, the performed operation in patients of this group should be low-traumatic and maximally organ-preserving. This rule should always be in spotlight as the " gold standard" for surgical treatment of CMN. In most cases, urologists refrain from operation of these patients, due to numerous secondary complications, large stones, the possibility of severe intraoperative bleeding. Removal of the kidney due to bilateral CMN should be carried out in exceptional cases.

The treatment of patients of the second group is considered more difficult. The most dangerous complication of UL, including CMN of a single or single –functioning kidney, is blockage of the ureter by stone and the development of anuria. These complications often develop with multiple kidney stones and CMN.

The probability of anuria in CMN is very high, and in CN of a single or single- functioning kidney is significantly low.

But, despite this, in these patients continue to progress chronic pyelonephritis and renal failure. Especially in the treatment of patients with CMN of single or single-functioning kidney, one of the main tasks is to direct all measures to maximize the outflow of urine from the kidney in a short time, and to prevent further.

Progression of chronic pyelonephritis renal failure. For this purpose, first of all conservative measures are taken. If these measures are taken. If these measures are ineffective, katheteriration or stenting of the ureter is performed and intensive conservative treatment is

continued. If these measures do not lead to the desired results, it is advisable to use hemodialysis. If it is impossible to catheterize the ureter, the patient is urgently operated on, if his general condition allows. Unsatisfactory general condition, i.e, a high content of nitrogenous toxin-s in the blood, is a direct indication for hemodialysis. Thus, when treating patients of the second group, preference should be given to urgent surgical tactics.

Indications for urgent operations may be the following:

1.Excretory anuria as a result of blockage of the ureter by the stone or necrotic mass.

2.Attacks of pyelonephritis on the background of obstruction of the ureter and impaired outflow of urine, accompanied by chronic renal failure (CRF)

3.Prolapse of a stent or drainage tube installed due to impaired passability of the ureter, as well as its blockage by salt masses as noted, opinions about the tactics of treating of CMN of a single or single-functioning kidney remain controversial to this day. Despite the proposal of different methods of treatment, open surgery remains the main method of treatment for this group of patients unlike CN of a single or single-functioning kidney, combined treatment may be more effective for patients with CMN and save them from lifelong hemodialysis and death. Regardless of the type of treatment, in both cases the patient faces a serious threat and the doctor faces responsibility. Considering, that in case of CMN of a single-functioning kidney, surgical tactics should end with the preservation of the kidney, a special meaning acquires the patients appeal on time and at the right address, that is, to a specialist involved in the treatment of this disease.

It should be noted that not all surgeons-urologists can perform all the necessary operations to the threat patients in this group. Before the fear of bleeding and other serious consequences, during the removal these stones, doctors refrain from surgery and redirect patients to conservative treatment.

Conservative treatment is unable to prevent the growth of a stone and the development of purulent complications, which leads to the

death of the kidney and the progression of renal failure. Sometimes in these patients, preference is given to such palliative operations as nephrostomy, pyelostomy, intrarenal stenting. And in some cases, in order to prevent anuria, drainage is left in the urinary tract for a long time, which leads to other serious complications.

Our experience shows that an untimely performed operation does not save a patient with CN of a single kidney, only if its function is intact, the intervention can be successful and effective. Otherwise, that is with expectant tactics in the treatment of these seriously ill patients, fearsome complications develop for her life.

One of the important factors in treatment is to ensure the outflow of urine in shortest possible time, to prevent chronic pyelonephritis and renal failure, when CMN leads to hydronephrotic transformation of a single kidney, even if there is no acute pyelonephritis. First of all, preoperative conservative treatment is carried out.

If these measures are ineffective, catheterization or stenting of the ureter is performed. After overcoming the obstacle by catheter or stent, conducting detoxication and anti-inflammatory therapy within 2-3 days, the patient is prepared for a planned operation. If, on the background of intensive therapy, after catheterization or stenting of the ureter, his condition does not normalize, azotemia does not decrease, he is taken an urgent operation, if allows his general condition. Ongoing severe azotemia on background of excretory anuria, a high content of nitrogenous toxins in the blood, is a contraindication for surgery and a direct indication for hemodialysis.

Surgical tactics in the third group coincides with the tactics chosen in the first group. In patients of this group, preference is given to phased tactics, as in the first group unlike other groups, preference was given to one-stage surgical tactics, that is, to perform an operation on both sides simultaneously, if allows their general condition. Currently, in such patients, on the one side, the ureteral stone is crushed by ureterorenoscopic lithotripsy, on the other an open operation is performed.

The treatment of patients of the fourth has some differences, since the patients in this group had CMN one the one side, and

hydronephrosis of non-stone etiology, representing a potential threat to their life, on the other side.

A feature of patients in this group is that hydronephrosis in these patients requires nephrectomy or reconstructive surgery. In some cases, it was necessary to perform organpreserving surgery on one side, nephrectomy, on the other side, simultaneously. In this group, surgical tactics was chosen taking into account the individual characteristics of the patient and the severity of the observed processes in the kidneys with the stability of the general condition in persons of not old age, nephrectomy can be performed on one organ-preserving surgery, stenting or expectant tactics on the other side. It should be noted that organ-preserving surgery on the one side is performed by a lumbotomy incision, nephrectomy on the other, in the patient's supine position, by an intercostal extraperitoneal semi-transverse incision.

Therefore, operating on the side with CMN, it is necessary to choose some tactics for the opposite side, which can be a simulta neos nephrectomy on the back, stenting or expectation.

The results show that following the geguence of the above algorithm, it is possible succes-sfully complete the treatment of bilateral CMN. One of the important tasks is the choice of surgical intervention for open surgical treatment of bilateral CMN. The existing numerous secondary complications in patients of this group require carrying out, if possible, minimally traumatic, organ-preserving and bloodless surgery. In our experience preference was given mainly to nephrolithotomy of posterior subcortical pyelolithotomy or pyelocalikotomy with calyces intersection, among organ-preserving operations used in bilateral CMN.

The character of the surgical intervention. Depended on the size and location of the stones, the condition of CPS of the parenchyma, the presence of upper urinary tract anomalies, and in any case was solved individually. In organ-preserving operations, temporary hemostasis comes to the fore, and it plays a decisive role for applied interventions. In this regard, the method of temporary hemostasis and anti-chemical protection of the kidney, becomes very important.

For this purpose, we used Lasix-3mg/kg isoptin- 0,2mg/kg, and emoxipin1 mg\kq. The renal artery ispinched 15 minutes after the intravenous administration of these substances, in order to protect the kidney. After removing the clamp from the renal artery, the introduction of these drugs again in the same dose, within the first give days after the operation, provides functional relief of the kidney. This principle in the surgical treatment of nephrolithiasis was first applied in our clinic.

All 250 observed patients underwent open surgical treatment. 127(50,8±3,2%) patients (62 men, 66 women) underwent surgery on.

The right side, 123 (49,2 ±3,2) (59 men, 63 women) on the left side. Arporos CMN, operation on the right side was performed d in 85 (34,0± 3,0%) patients, on the kept side in 84 (33,6±3,0%) patients. The main initial stage of open surgical treatment of UL, including CMN, is the use of surgical access to the kidney. At the moment there are two main types of this access: extraperitoneal and transperitoneal.

Dne to danger of transperitoneal access in CMN, we have never used it. In recent years, extraperitoneal access to the kidney has been widely used in open surgical treatment of nephrolithiasis. Of the possible (anterior, lateral and posterior) incisions, with CMN, we preferred lateral intercostals incisions.

During operations in the observed patients, the following incisions were used. In 159(63, 6± 3, 0%) patients XI intercostal (on the right side 72 in the left side 87) in 13 (5,2±4,8%), XI intercostal plus oblique incision by Piroqov (on the right side 8, on the left side 5), in 10 (4,0±1,2%) patients X intercostal (on the right side 5,on the left side 5), in 43 (17,2±2,4%) patients. Lumbotomic (on the right side 26, on the left side 20) in 17(6,8±1,6%)patients oblique incision by Piroqov (on the right side 11, on the left side-6) (table 6).

In the first group,the operation on the right side was completed in one (0,8%) patient with percutaneous nephrostomy, in the third group in 2(2,9%) patients only with mechanical lithotripsy of the bladder stone, in 1(1,4%) patients with epicystomy.

Table 6
Incisions used in different groups of patient

Kəsiklər	I group (n=125)		II group (n=35)		III group (n=70)		IV group (n=20)		Total (n=250)	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
İn XI inter-costal space	35 27,2%	46 36,8%	12 34,3%	8 22,9%	19 27,1%	25 35,7%	8 40,0%	8 40,0%	72 28,8%	87 34,8%
in XI inter-costal space plus an oblique incision by Pirogov	5 4,0%	4 3,2%	3 8,6%	1 2,9%	–	–	–	–	8 3,2%	5 2,0%
İn X inter-costal space	4 3,2%	5 4,0%	–	–	1 1,4%	–	–	–	5 2,0%	5 2,0%
lumbotom-ic	10 8,0%	10 8,0%	6 17,1%	4 11,4%	6 8,6%	5 7,1%	3 15,0%	1 5,0%	25 10,0%	20 8,0%
oblique incision by Pirogov	3 2,4%	2 1,6%	1 2,9%	–	7 10,0%	4 5,7%	–	–	11 4,4%	6 2,4%
Total	57 45,6%	67 53,6%	22 62,9%	13 37,1%	33 47,1%	34 48,6%	11 55,0%	9 45,0%	123 49,2%	123 49,2%
	124 99,2%		35 100%		67 95,7%		20 100%		246 98,4%	

As indicated above, the surgical treatment of CMN depends on several factors, including the location of the stone, type of pelvis. Of the observed patients, in114 (45,6±3,2%) was (61 on the right side, 53 on the left side), in 79(31,6±2,9%) extra renal 33 on the right side, 43 on the left side), in 39 (15,6±2,3%), nuxed (19 on the right side, 20 on the left side) from of pelvis (table 7).

During operations in different groups of patients, different methods of kidney drainage were used. In 47 (18,8±2,5%) patients, (32 on the right side, 15 on the left side) the operation was completed with nephrostomy, in 28 (7,2±2,0%) patients (16 on the right side, 12 on the left side) with pyelostomy, in 111(44,4±3,1%) patients (55 on the right side,56 on the left side) with renal stenting, in 6 (2,4±1,0%) pa-

tients (2 on the right side,4 on the left side) with nephrostomy, together with stenting. The results of the operations by groups were following.

Table 7

The forms of the renal pelvis that we encounter in patient groups

The forms of the renal pelvis	I group (n=125)		II group (n=35)		III group (n=70)		IV group (n=20)		Total (n=250)	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
İntrarenal form	28 22,4%	21 16,8%	11 31,4%	7 20,0%	16 22,9%	19 27,1%	6 30,0%	6 30,0%	61 24,4%	53 21,2%
	49 39,2%		18 51,4%		35 50,0%		12 60,0%		114 45,6%	
Extrarenal form	12 9,6%	27 21,6%	8 22,9%	6 17,1%	10 14,3%	9 12,9%	3 15,0%	1 5,0%	33 13,2%	43 17,2%
	39 31,2%		14 40,0%		19 27,1%		4 20,0%		76 30,4%	
Mixed form	13 10,4%	16 12,8%	2 1,6%	-	2 2,9%	2 2,9%	2 10,0%	2 10,0%	19 7,6%	20 8,0%
	29 23,2%		2 1,6%		4 5,7%		4 20,0%		39 15,6%	

In the first group out of 125 patients, in 58 (46,4±4,5%), the operation was performed on the right side, in 67 (53,6±4,5%), on the left side. In case of CN, the operation was performed on the right side in 18 (14,4± 3,1%), on the left side in 19 (15,2± 3,2%) patients and the case of CMN in 40 (32,0±4,1%) on the right side and in 48 (38,4±4,4%) patients on the left side.

Of open operations, in 30 (24,0±2,9%) patients (12 on the right side,18 on the left side) was performed only nephronlithothomy, in 67 (53,6±4,5%) patients (30 on the right side, 37 on the left side) posterior subcortical pyelolithotomy. In all other cases, patients were underwent two or more operations (pyelolithotomy plus nephrolithotomy plus ureterolithotomy) simultaneously.

In 7(5,6±2,1%) patients, by two incisions simultaneously removed the stones of the kidney and ureter by corresponding side. In 8 (6,4±2,2%) patients was performed nephrectomy, apropos compli-

cation by pyonephrosis (5 on the right side, 3 on the left side). In 14 (11,2±2,8%) patients the operation was performed apropos by recurrent stone..

In patients, who underwent repeated operation apropos by stone, the shortest time interval between the first and second operations was 2 year, the longest-37 years, on average -10 years. Same time, the time interval between the stages ranged from 2 months to 8 years.

In 36 (28,4±4,1%) patients operation was performed with clamping of the renal artery. At the same time, the shortest time of clamping the renal artery was 5 minutes, the longest -51 minutes, on average-18,7 minutes.

The average duration of the operation was 2,4(1-6) hours blood loss-80 (50-300) ml.

In 20(16,0±3,3%) patients of first group, the residual stone was revealed after surgery stonelles status was achieved in 84,0% of cases of this group.

In the second group out of 35 patients, in 22(62,9 ±8,2%) the operation was performed on the right side, in 13(37,1± 8,2%) patients on the left side.

In this group, the stone was in 22 (62,9±8,2%) patients in the right and in 13 (37,5±8,2%) patients in the left kidney. As well,20 (57,5±8,4%) patients had a stone of the single kidney, that remained after nephrectomy, 2 (5,7±3,9%) had stone of a congenial single kidney, and 13 (37,5±8,2%) had stone of a single functioning kidney.15 patients were admitted to the department with anuria. During operations, CMS were removed from the kidney, in 14 (40,0±8,3% patients on the right side, in 9 (25,7±7,4 %) on the left side, also only (CS) in 8 (22,9±7,1%) on the right side, in 4 (11,4±5,4%) on the left side.

Pyelolithotomy was performed in 20 (57,1±8,4%) patients on the right side, in 10 (57,1±8,4%) on the left side, nephrolithomy in 1(2,9 ± 2,8%) patient on the right side, in another patient on the left side. Pyelonephrolithotomy in 1 patient on the right side.

Out of 15(42,9±8,4%)patients with anuria and ureterohydronephrosis, in 4 (11,4±5,4%) patients was performed catheterization,

and in 11(31,4±7,8%) stenting of ureter. In this group, out of 15(42,9±8,4%) patients in 5 (14, 3± 3,9%) was performed urgent operation. In 2 (5,7±3,9%) patients, together with pyelolithotomy on the right side and in 3 (2,9±2,8%)patients with posterior pyelolithotomy on the left side, simultaneously, and by two incisions was performed extraction the stone of lower 1\3 ureter by corresponding side. One patient with a single –functioning kidney underwent nephrectomy.

In 4 (11,4±5,4%) patients the operation was performed apropos by recurrent stone in patients, who underwent repeated operations, due to stone, the shortest period between the first and second operations was 6 months, and the longest was 5 years, on average 2 years.

In total, 35 patients underwent 70 operations on one on another side. (on the right side 42, on the left side 28). In 2 (5,7±3,9%) patients the operation was performed with clamping of the renal artery. At the same time, the shortest time for clamping the renal artery was 8 minutes, the longest 21 minutes, on average 12,5 minutes.

In this group, the average duration of the operation was 2,4(1-8 hours, blood loss-70(50-200)ml.

In 4 (11,4±5,4%) patients of second group, after surgery residual stone was identified. Stonelles status was achieved in 90% of cases in this group.

In the third group out of 70 patients, in 36 operation was performed on the right side, in 34 on the left side. During operations, CMS were removed from the kidney in 24 (34,3±5,7%) patients on the right side, in 21 (30,0±5,5%) on the left side, as well only CS in 12 (17,1±4,5%) on the right side, in 13 (18,6±4,6%) patients on the left side pyelolithotomy in 19 (27,1±5,3%) patients on the right side, in 16 (22,9±5,0%) patients on the left side.

All other patients underwent 2 or more operations at the same time (pyelolithotomy plus ureterolithotomy). In 11 patients, ureterolithotomy was combined with surgery on the side. 8(3,2%) patients underwent surgery due to recurrence of the stone. In patients, who underwent repeated operations due to a stone the shortest period between the first and second operations was 3 years, and the longest

was 10 years, on average 8 years. In addition, in 8 (3,2%) patients of this group, simultaneously with the operation on one side or the other, stenting was performed on the opposite side. 19 (27,1± 5,3%) patients underwent 27 a staged open operation on one, on the opposite side. In 3(4, 3±2,4%)patients with pyonephrosis of one or another side, nephrectomy was performed. 11(4, 4%) patients underwent renal artery clamping. At the same time, the shortest time of renal artery clamping was 8 minutes the longest 28 minutes, on average 14 minutes. In this group, the average, duration of the operation was 2,1 (1,2-4) hours, blood loss 70 (50 -200) ml. a residual stone was found in 16 patients of this group after surgery. Stone less status was achieved in 93, 6% of cases in this group.

In this group, a total -70 patients underwent 116 operations on one side or another(on the right side 51 on the left side 65 as a result of these)operations 616 stones were removed. Of the removed stones 389 were yellow brown, 175 black –brown,30 orange –brovn,35 white.

In the fourth group Surgical treatment of CMN was performed in 20 patients. Of them, in 11 (55,0±11,1%) patients on the right side in 9 (45,0±11,1%) on the left side. During operations CMN were removed from kidney in 7 (35,0±10,7%)patients on the right side in 6 (30,0±10,2%) patients on the left side as well only CS in 4 (20,0±8,9%) on the right side, in 3 (15,0±8,8%) patients on the left side. Pyelolithotomy was performed in 9 (45,0±11,1%) patients on the right side in 5 (25,0±9,7%) patients on the left side, nephrolithotomy in 2 (10,0± 6,7%) on the right side in 1 (5,0± 4,9%)on the left side. Along with this, of the patients operated due to CMN on the right side, 2 patients underwent nephrectomy, 1 (5,0±4,9%) underwent ureteronephrectomy on the left side, due to complications by pyonephrosis, 9 (45,0±11,1%) patients underwent renal stenting ended with nephropexy. Of these in 38 (15,2±2,3%) patients the operation was performed on the right side (13 men, 25 women),in 34 (13,6±2,2%) patients on the left side (14 men, 20 women) in 20 (10,0±1,7%) patients nephropexy was performed due to mobilization of the kidney, during surgery (18 on the right side, 34 on the left

side). 24(19,2± 3,5%) patients of first group 4(11,4±5,4) of second group 8(11,4±3,8%) of third group, in total 36(14,4±2,2%) patients underwent surgery due to recurrent stone.in patients who underwent a second operation due recurrent stone, the shortest period between the first and second operations was the first and second operations was 2 years and the longest 37 years, on average 10 years in the first group, the shortest time 6 month and the longest 15 years on average 2 years in the second group, the shortest time was 3 years and the longest time was 10 years on average 8 years in the third group. In general, the shortest period between the first and second operations was 6 months and the longest was 37 years on average 6,6 years.

In 35(28,0±4,0) patients, the operation was performed by stages. The shortest time between stages was 2months, the longest 8 years.

In 14 (5,6±1,5%) patients, simultaneously with two incisions a stones of kidney and lower 1|3 part of the ureter were removed, in 1(0,4±0,4%) patients a stones of kidney, of ureter and of bladder were removed during open surgical treatment of CMN in 15(6,0±1,5%) patients nephrectomy was performed due to complication by pyonephrosis, and in 4(1,6±0,8%) patients due to complication by hydronephrosis of non –calculi etiology. Out of 3137 removed kidney stones,1358 were yellow brown 1620 black brown 85 orange brown,74 white.

Stone free status was achieved in 84,0% cases of first, 94,4% cases of second, 93,6% cases of third, 93% cases of fourth group.

In recent years, in the field of surgical treatment of urolithiasis, including CMN, great success has been achieved. This is primarily due to the improvement of methods for treatment of CMN, the timely application of high-tech diagnostics, the development of anesthesiology and resuscitation. These successes are once again confirmed by the nearest and distant results of operations, in the patients we observed.

The main objective indicators for assessing the nearest results of any surgical method of treatment and metaphylaxis, the disease recurs in 35-75% as a result of a number of cases, repeated operations are required, and in 22-26% cases of them, various complications are

observed, and these complications ended in 11% of cases with nephroctomy, in 3% of cases with death [13] [14].

With CMN, in operated patients, depending from the type and technique of operations, various forms, severity and frequency of occurrence, complications can be observed. Our studies show, that the number and frequency of these complications directly depends from the operation itself, from the condition of the operated kidney, the number of incisions, made on the parenchyma during the intervention and other invasive procedures.

These complications are divided into two groups, such as early and late, and early, in turn, on intraoperative and postoperative. In the postoperative period, depending from the time of occurrence, there may be late complications.

Intraoperative complications include bleeding, opening of the pleural and abdominal cavities during surgery, as well as complications in other organs. In the postoperative period, such early complications as postoperative bleeding, exacerbation of chronic pyelonephritis, renal failure, thromboembolic complications, wound suppuration are often observed.

One of the rare complications of the early period is the formation of urinary and fecal fistulas. Such complications can occur mainly in patients with recurrent stones and purulent-cicatricial changes in the perirenal tissue (armored paranephritis).

Late complications mean the condition of the postoperative scar, changes in the anatomical and functional state of the upper urinary tract, narrowing after injuries of the (PUS), long-functioning urinary fistulas, cicatricial narrowing of the isthmus of the calyces, sclerotic wrinkling of the renal parenchyma, finally, the identification of recurrent stones.

The above complications, in turn, can be conditionally divided

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[13] Дзеранов, Н.К. Оперативное лечение коралловидного нефролитиаза / Н.К. Дзеранов, Э.К. Ясненко // Урология и нефрология, - Москва: - 2004. №1, - с. 34-38.

[14] Worcester, E. Nephrolithiasis. Primary Care // Clinics in Office Practice, - 2008. v. 35, - p. 369.

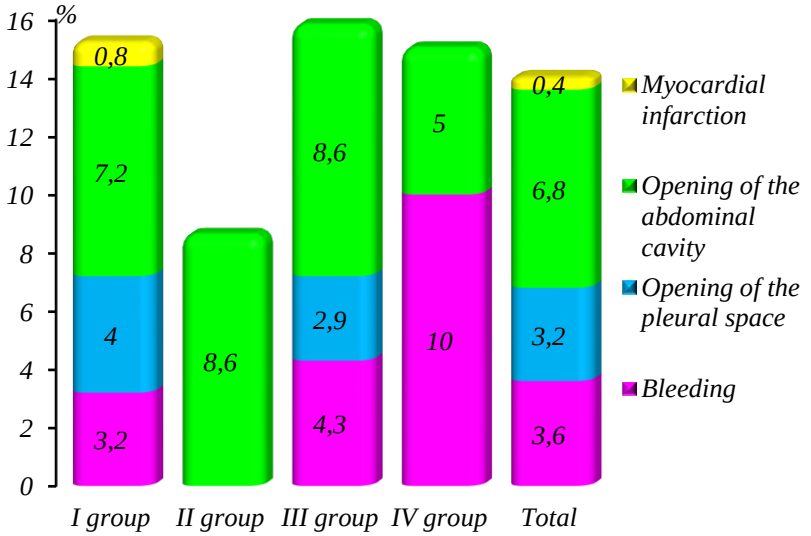
into three groups, taking into account their danger to the patient's life. Early complications of the first group are not a direct threat to the patient's life. These include the opening of the pleural and abdominal cavities during the operation, suppuration of the surgical wound, exacerbation of chronic pyelonephritis, identification of recurrent stones. Early complications of the second group are a direct threat to the patient's life. Such complications are parenchymal bleeding during and after surgery bacteremic shock, progression of CRF, gastrointestinal bleeding, cardiovascular failure, myocardial infarction, pulmonary embolism, thrombophlebitis of the lower extremities and small pelvis.

The third group includes late complications after surgery due to CMN. These include a narrowing of the (PUS) due to its damage during surgery, cicatricial narrowing of the isthmus of the calyces, sclerotic wrinkling of the renal parenchyma, recurrent stones. The correct choice of surgical tactics for CMN, organ-preserving surgery, maximum extraction of stones during the intervention, elimination of conflict in the upper urinary tract and (PUS) to preserve kidney function, the course of the operation and the postoperative period without complications, is assessed as the “gold standard” of treatment.

During an operation to extract the stones, one of the most dangerous complications, as a result of damage to calyces neck is bleeding. Analysis of complications, arising from open surgeries shows that fleeding is mainly observed during primary operations requiring multiple nephrotomy due to (CS) of large sires and complex shapes. As, at this time, the thickness of the parenchyme remains sufficiently in tact. During repeated operations, bleeding is mainly observed from the surrounding scar tissue and from the kidney that underwent decapsulation. On the other side, during (CN) extraction, severe bleeding is observed, as a result of rupture of the calyces neek (graph 2).

Considering the risk of bleeding during bilateral surgery due to (CMN),wide and multiple nephrostomies, as well as intrarenal reconstructive surgeries, are performed mainly with temporary compression of the renal artery. This manipulation not only reduces bleeding during surgery, but also reduces the tension of the renal parenchyma,

improves the access to the calyces pelvic system (CPS). As a result, it is possible completely to release the kidney from stones. Therefore, when the renal artery is clamped after operations, with aim of prophylaxis of ischemic damages along with other types of treatment, it is necessary to carry out proper anti-ischemic treatment. It should be noted that during surgical operations in this severe group of patients, despite all the therapeutic activities during and after operation, the risk of bleeding remains. In the postoperative period, the observed bleeding, taking into account their early and late emergence, are divided into two groups.



Graphic 2. Complications arising in groups of patients during surgery.

With early bleeding, during and after surgery, as well as when the patient is transferred to the intensive care unit, parenchymal hemorrhages are possible. These hemorrhages are associated with an increase of intrarenal pressure, which is formed as a result of an increase of blood pressure, due to transfusion of blood substitude, as

well as a result of blockage of the renal pelvis by the blood clots. It should be noted, that bleeding that occurs during and after surgery leads to a decrease in the volume of circulating blood. As a result of ongoing bleeding, a number of irreversible severe processes occurs in the body. The first and most dangerous of them, with continued bleeding from organ, that has undergone a purulent-necrotic process and severe surgical trauma, is the development of disseminated intravascular coagulation (DIC) syndrome.

DIC syndrome is a general pathological process, accompanied by the appearance in the blood of large number of coagulation activators formation of microthrombi in the blood, as well as cell aggregates, impaired microcirculation in tissues and organs, impaired organ function, the occurrence of hypoxia, acidosis, dystrophy, infection. The reasons for this pathological process are different. One of them, a large surgical trauma and ongoing bleeding on its background. Despite the different reasons for the formation of the DIC syndrome, its pathogenesis is based on damage to the tissues of the endothelial layer of blood vessels and the platelet-macrophage system. Bleeding is the cause of anemia, a decrease index of hematocrit, in a severe case, the development of hemorrhagic shock.

Violation of microcirculation can cause respiratory failure (shortness of breath, cyanosis, pulmonary edema, pulmonary infarction), acute renal failure and in severe cases of hepatorenal syndrome.

According to our observations, during the operation in the first group in 4 (3,2±1,6%), in the third group in 3 (4,3±2,4%), in the fourth group in 2 (10,0±6,7%) patients there was slight bleeding. In the fourth group, the bleeding observed in one patient, complicated by the DIC syndrome, was fatal **(**table 8).

In postoperative period, 28 (11,2± 2,0) patients had wound suppuration 44(17,6± 2,4%) (18 men,26 women) had exacerbation of chronic pyelonephrihis 23 (9,2±1,8%) (10 men, 13 women) had exacerbation of chronic renal failure,49(19,6±2,5%) patients had anemia on background of chronic pyelonephritis, CRF. In patients with anemia the hemoglobin level in the blood was 50-85 g|l (on average

71, 9±0,4). Of these 8 (3,2±1,1%) patients received blood transfusions after surgery. In 3 (1,2±0,7%) patients blood transfusion was carried out on background of hemodialysis.

Table 8
Postoperative complications by groups (classification by Clavion Dindo, 2004)

Complications	I group (n=125)	II group (n=35)	III group (n=70)	IV group (n=20)	Total (n=250)
Exacerbation of chronic pyelonephritis I class	20 16,0±3,3%	7 20,0±6,8%	12 17,1±4,5%	5 25,0±9,7%	44 17,6±2,4%
Suppuration of the wound I class	12 9,6±2,6%	5 14,3±5,9%	6 8,6±3,3%	5 25,0±9,7%	28 11,2±2,0%
Exacerbation of chronic renal failure IVa class	10 8,0±2,4%	7 20,0±6,8%	6 8,6±3,3%	–	23 9,2±1,8%
Toxic anemia II class	21 16,8±3,3%	11 31,4±7,8%	12 17,1±4,5%	5 25,0±9,7%	49 19,6±2,5%
Residual stone III class – IIIb	20 16,0±3,3%	4 11,4±5,4%	16 22,9±5,0	4 20,0±8,9%	44 17,6±2,4%
Death – V class	1 0,8±0,8%	2 5,7±3,9%	–	1 5,0±4,9%	4 1,6±0,8%

Practice shows that the treatment of coral nephrolithiasis should be in all cases/ But removal of the stone from the kidney due to coral nephrolithiasis with the use of any method of treatment, does not relieva the patient from this disease . Only carrying out metaphylactic measures after performing any operation due to coral nephrolithiasis can increase its effectiveness. Postoperative metaphylactic measures can minimize the risk of reoperation, preventing recurrence of stone formation.

Some general and local risk factors play an important role in the formation of recurrent stones after surgery for CMN. General factors mean metabolic disorders. Also in the formation of recurrent stones, diffuse changes in the parathyroid glands are important.

Considering the role of parathyroid hormone in the etiology of CMN, ultrasonography of the thyroid and parathyroid glands was

performed in 62 (24,8±2.4) patients. 4 (1,6±0,8%) of them had diffuse goiter, 12(4,8±1,4%) had weak diffuse changes. This may be warning of a possible future recurrence of CMN.

Currently, surgical methods aimed at the destruction and elimination of stones occupy one of the main places in the treatment of coral nephrolithiasis. But without metaphylaxis, within 5 years after surgery almost in half of patients may occur the coral stones. More than 60% of relapses are observed three years later, after removal of primary stones. In this regard, the interests of modern researchers of urolithiasis are aimed not only at treatment of CN, but also at the prevention of recurrent stone formation. In CMN special metaphylactic measures are carried out taking into account the mineralogical composition of the stones.

Metaphylaxis includes postoperative conservative therapeutic activities carried out after various types of surgical treatment, aimed at eliminating inflammatory changes, hemo- and urody- stimulating the excretion of stones, corpreventing the development of residual fragments, stone formation, relapses and others.

Postoperative metaphylaxis in parents with CMN is divided into 2 groups: general and special. General metaphylaxis, in turn is divided into early and late (dynamic metaphylaxis) periods.

The tasks of early metaphylaxis after surgery are the following measures: the fight against inflammattory processes in the kidney, surrounding tissues and urinary tract, stimulating elimination of disintegrating stone fragments, improving hemo-andurodynamics, preventing the development of cicatricial- sclerotic processes in the surgical area, in the renal parenchyma, ureteral wall, perirenal, paraurethral tissue.

The first stage of metaphylactic activities lasts 3 months and during this period the course of chronic pyelonephritis stabilizes, sclerotic changes develop in the kidney and surrounding tissues associated with the operation itself and its complications. During this period with the development of changes in the perirenal tissue and PVS, detection of urinary tract dyskinesia, conservative treatment can eliminate urodynamic disorders. This accordingly prevents exacerbation

of chronic pyelonephritis and recurrence of stone formation. During this period, the disintegrating fragments of the stone are extracted. The second stage (dynamic metaphylaxis) of metaphylactic activities continues throughout life and it faces tasks that differ from the first stage.

These include the following:

1. Treatment and prevention of chronic pyelonephritis and urinary tract infections, dynamic monitoring of them.

2. Treatment and prevention of hemo- and urodynamic disorders, dynamic monitoring of them.

3. Assessment of metabolic disorders in patients with CMN

4. Determination of the metaphylactic program of patients with CMN of various composition, taking into account the risk factors of recurrent stone formation

5. Treatment of residual calyx stones, prevention of their growth and dynamic monitoring of their progress

6. Carrying out a full complex of clinical observation and examination to determine the time of conducting and indications for planned surgical treatment in patients with recurrent CMN.

The accomplish these tasks, improve treatment results and reduce the frequency of recurrence of stone formation, it is very important to develop an optimal diagnostic algorithm.

In the first year, laboratory recurrence of pyelonephritis was noted by us in 34,9% of patients. In these patients, the urinary tract was completely cleared of stones and there was no recurrence of stone formation. In stones, there was an exacerbation of pyelonephritis and this requires a full and repeated course of treatment. Regular monitoring of urine analysis every 10-14 days within 2-3 months, allows to detect an exacerbation of pyelonephritis in its early stages and eliminate it in time. In subsequent period, relapses are significantly reduced.

Urine tests should be repeated every 1-1,5 months, for a long time (at least 1 year). At the same time, it is advisable to conduct an ultrasonography at least 3 times a year.

Dynamic follow-up by ultrasonography in patients, who have

undergone surgery due to CMN is considered the main and valuable method for tracing. The use of ultrasonodetect of changes in the urinary tract at early stages, that is, in cases where conservative treatment effectively prevents irreversible changes in tissues. Non-invasiveness and simplicity of this research method allows it to be widely used in outpatient clinics.

Special attention is required for patients with hydronephrosis of stone etiology (patients of 4 group). In these patients, together with the usual ultrasonography of the kidneys, it is advisable to examine the ureter and its intramural section. Not only through the anterior abdominal wall, but also by a rectal sensor with a full urine bladder.

Sometimes changes in the urinary tract, due to features of their macroscopic structure, may be associated with the presence of valve stones, partially blocking the ureter. In our cases for outpatient observation together with other studies, ultrasonography was also carried out. The purpose of the ultrasonography was not only the detection of residual and recurrent stones and the assessment of the condition of the upper urinary tract, as well as the study of the condition tissue in the operation area. A tissue in the operation area, a pelvis system, is regarded by us an inflammatory reaction. When such changes were detected, medical treatment was used to improve blood circulation and normalize inflammatory processes in the affected tissues. During outpatient observation in the postoperative period, all patients had chronic pyelonephritis. Taking this into account, for all patients was prescribed anti-inflammatory and antibacterial treatment.

In our observations purposeful treatment of chronic pyelonephritis was carried out from several weeks up to several months, until normal urine analysis values were obtained. In the complex treatment used antibacterial and anti-inflammatory medicines, vitamins, immunomodulators, herbal diuretics, if necessary detoxication solutions for intravenous administration. With different methods of surgical drainage of the urinary tract are used and this affects on the course of inflammatory processes in the postoperative period.

Open surgical treatment in patients, who have been monitored, in

192(76,8±2,7%) cases ended by drainage of the urinary tract. Drainage of the urinary tract reduces their ability to contract. As a result, a condition is created for their relative calmness and reduction of the inflammatory response. In addition, the existing hypotension creates conditions for the migration of residual stones fragments from the calyces to the lower sections.

In general, the purpose of drainage souring surgery, regardless of its type, is to create relative calm and to prevent an increase of intrarenal pressure. This, in turn, minimizes the risk of activating chronic pyelonephritis. The above statistics indicate that in recent years, preference is given to internal drainage (stenting) of the urinary tract.

Determination of the mineralogical composition of stones plays an important role in the study of metabolic disorders in the body in CMN and in the development of metaphylactic measures in this direction after surgery. It should be noted, that in a certain part of the patients, whom we observed, the mineralogical composition of the stone after operation was studied. The mineralogical composition of stones in 66 patients, whom we operated due to CMN, was studied in the analytical laboratory of the institute of Geology of Azerbaijan National Academy of Sciences. Taking into account the results of these studies, we have developed metaphylactic measures to prevent recurrence of stone formation.

As a result, in the study of long-term results in the period 1-14 years, of the studied in 38 (30,4±4,1%) (on the right side-20, on the left side -18) patients of the first, in 6 (17,1±6,4%) (on the right side-3, on the left side-3) patients of second, in 8 (11,4±3,8%) (on the right side-5, on the left side-3) patients of third, in 4 (20±8,9%) (on the right side-2, on the left side-2) patients of fourth, group, generally in 66 patients have detected recurrent stone.

All,250 observed patients underwent open surgical treatment. The study shows that out of 250 patients with bilateral CMN, in 246 (98,4±0,8%) patients open surgical treatment was successful, in 4 (1,6±0,8%) patients death was noted. During surgical treatment in 231 (92,4±1,7%) patients the operation was performed with preserva-

tion of organ, in 15 (6,0±1,5%) the organ was removed. Thus, the modern principles of CMN treatment require from urologists to perform low-traumatic, radical effective organ – preserving, with minimal blood loss stone removal operations.in the postoperative period of CMN various complications are observed such as the formation of recurrent stones, exacerbation of chronic pyelonephritis renal bleeding deterioration of the function of the operated kidney.

CONCLUSIONS

1. In order to choose thaw correct and more relational tactics of treatment due to bilateral CMN, grouping of patients according to the characterics of changes in both kidneys and ureters, facilitators treatment tactics and increases the effectiveness of surgical treatment [19, 34, 35, 42, 47].

2. Only in individual cases of CMN ultrasonography can accurately determine the true size and number of stones .if even on ultrasonography over coral stones, the parenchyma is defined throughout the kidney, the total volume of the kidney has not increased or there is a slight increase and there is no expansion in the CPS, the patients hyperazotemia indicates damage to the renal tissue by fatty degeneration, wrinkling and loss of potential kidney functionalities. the patient is at the terminal stage of CRF and surgical treatment will not give positive results [22, 23, 36, 39].

3. The treatment by an algorithm, developed according to the proposed classification, which takes into account changes in the upper urinary tract, also carrying out staged treatment in patients of first group carrying out in most cases, urgent treatment in patients of second group, staged and simultaneous open surgical treatment on both sides, or open surgical treatment on one side, URL operations or ESWL on other side, in patients of third group, carrying out a surgical tactics, taking into account the general condition of patient and the functional capabilities of the kidneys, in the patients of fourth group, increases the effectiveness of open surgical treatment [34, 38, 39].

4. If it is necessary to clamp the renal artery during open surgical treatment of bilateral CMN, intravenous administration of Lasix, at the rate of 3 mg| kg, isoptin 0,2mg|kg, and emoxipin 1 mg|kg at 15 minutes before clamping previsedreliable and less invasive pharmacological anti-ischemic protection and increases its effectiveness. For functional relict of the kidney, then daily administration of these drugs continues in the same doze, for 5 days after surgery [10, 13, 14, 35, 48].

5. During the open surgical treatment due to bilateral CMN based on reliable results the index purification the kidneys from stones “stone free rate”, in the first group was- 84,0%, in the second-94,4%,in the third- 93,6%, in the fourth-98,4%, average-93% [19, 44, 46, 47].

6. In open surgical treatment of bilateral CMN, intraoperative complications were noted in 14,4% of cases. The immediate postoperative complications were also noted, which in 17,6% of cases was an exacerbation of chronic pyelonephritis in 11,2% of cases, suppuration of a surgical wound that did not require surgical treatment, in 92% of cases, progression of chronic renal failure, in 19,6% of cases toxic anemia, in 26,4% of cases formation of recurrent stone, according to observations for 1-14years [32, 34, 35].

7. Studies to determine the mineralogical composition of CS show that most stones mainly contain calcium and magnesium ions, phosphate and various trace elements .In the formation of recurrent stones after surgery due to CN, common factors are important, such as metabolic disorders diffuse changes in the parathyroid glands, and local ones such as phosphaturia and pyelonephritis [34].

PRACTICAL RECOMMENDATIONS

1. The application of the treatment algorithm, compiled by the proposed classification for bilateral CMN, provides the correct treatment tactics in these severe groups of patients

2. To study the anatomical and functional state of the kidneys and urinary tract, the shape of the pelvis (intrarenal, extrarenal) local-

ization of the stone (in the pelvis, in the calyx, in the ureter) in bilateral CMN, a direct indication is X-ray examinations (EU CT-scan)

3. Expectant tactics in these groups of patients can lead to the growth of a stone, complete destruction of the kidney as a results of a purulent process, to the progression of renal failure. Considering this it is advisable to carry out surgical treatment in this group of patients at an earlier date.

4. The ineffectiveness of the conducting intensive treatment in bilateral CMN complicated by CRF without acute disturbance of urodynamics, testifies to irreversibility of structural changes in the kidneys (single kidney) and indicates the futility of organ – preserving operations.

5. Clamping of the renal artery is a rational way to block the renal blood circulation in the surgical treatment of CMN and applied the complex of pharmacological measures of antiishemic protection, to eliminate damage clamping only the renal artery, but bot the entire its vascular ligamentum and conducting complex pharmacological measures of anti-chemical protection, contribute to suggestful completion of the operation, and also minimize the possibility of complications in the future.

6. Metaphylactic measures after surgery, due to CN, should be carried out taking into account not only local factors (urine PH, inflammation process), but also the mineralogical composition of the stone.

List of scientific papers, published on the topic of the dissertation

1. Imamverdiev, S.B. Orqan-salvaqe surrqery for staqhorn and multifoculi nephrolithiasis at elderly patients / S.B. Imamverdiev, T.A. Talibov, Ch. Sh. Ali-zade // Eastern Medical Journal, - 1999. v 4, № 1-4, - p. 17-25.
2. İmamverdiyev, S.B. Ikitərəfli mərcanvari və çoxlu nefrolitiazin müalicəsində cərrahi taktika / S.B. İmamverdiyev, T.A. Talibov // Azərbaycan təbabətinin müasir naliyyətləri, - Baki: - 1999. № 1, - s. 37 – 40.
3. İmamverdiyev, S.B. Yeganə böyrəyi və kalkulyoz anuriyasi olan xəstədə qlükoza - 6 - fosfatdehidrogenaza (Q-6-f D 16) fermentinin defisiti təsadüfü / S.B. İmamverdiyev, T.A. Talibov, Y.M. Astanov // Sağlamliq, - Baki: - 2000. № 9, - s. 50-52.
4. Имамвердиев, С.Б. Малотравматичная хирургия коралловидного и множественного нефролитиаза / С.Б. Имамвердиев, Е.Ф. Талыбов, Р.Н. Мамедов // Азерб.мед.журн., - Баку: - 2000. №4,- с. 38-42.
5. İmamverdiyev, S.B. Renoparenximatoz hipertoniya zamani ürək çatişmazliği olan xəstələrdə angiotenziv II reseptorlarinin blokatorlarinin kliniki effekti / S.B. İmamverdiyev, F.M. Zeynalov, T.A. Talibov [və b.] // Azərbaycan tibb jurnali, - Baki: - 2002. № 2, - s. 36-42.
6. Имамвердиев, С.Б., Т.А. Талыбов, Р.Н. Мамедов, Р.Н. [и др.]. Профилактика кровотечения у больных с нефролитотомией «Сборник статьей посвещены 75-летию акад. М.Д.Джавад-заде, - Баку: - 2002, - с. 278-285.
7. İmamverdiyev, S.B., Talibov, T.A. Bayramov, A.F. İkitərəfli mərcanvari və çoxlu nefrolitiazin müalicəsində cərrahi taktika // Professor N.L. Əfəndiyevin 80 illik yubileyinə həsr olunmuş konfransin materiallari, - Baki: - 2004, – s. 67-70.
8. İmamverdiyev, S.B. Uroloğiya. Dərslik // S.B. İmamverdiyev, T.A. Talibov, - Baki, – 2005. - 496 s.

9. İmamverdiyev, S.B. Uşaqlarda mərcanvari və çoxsayli nefrolitiaz zamani cərrahi taktika / S.B. İmamverdiyev, T.A. Talibov, V.Y. Əbdürrəhimova // Azərbaycan Tibb jurnali, - Baki: - 2006. № 1, - s.13-18.

10. İmamverdiyev, S.B., Talibov, T.A. Əbdürrəhimova, V.Y. [və b.]. Uşaqlarda mərçanvari və çoxlu nefrolitiazin çərrahi müalicəsi zamani böyrəyin işemiyadan müdafiə üsulu // Əziz Əliyevin 110 illiyinə həsr olunmuş elmi- praktiki konfransin materiallari, - Baki: - 2007, - s. 77-80.

11. İmamverdiyev, S.B. Mərcanvari və çoxlu nefrolitiazin müalicəsində bizim təcrübəmiz / S.B. İmamverdiyev, Talibov T.A., R.N.Məmməov // Azərbaycan Tibb Jurnali, - Baki: - 2007. № 2, - s. 55-57.

12. İmamverdiyev, S.B. İkitərəfli mərcanvari və çoxlu nefrolitiazin təsnifati və müalicə prinsipləri / S.B. İmamverdiyev, T.A. Talibov, V.Y. Əbdürrəhimova // Azərbaycan Təbabətinin müasir naliyyətləri, - Baki: - 2008. № 3., - s.123-131.

13. İmamverdiyev, S.B., Talibov T.A., Məmməov R.N. [və b.]. Mərcanvari nefrolitiazin cərrahi müalicəsi zamani böyrək-qan dövraninin blokadasi üsullari // Əməkdar elm xadimi, prof. R.Ə.Əsgərovun anadan olmasinin 75 illiyinə həsr olunmuş konfransin materiallari, - Baki: - 2008, - səh.95-97

14. İmamverdiyev, S.B. Mərcanvari nefrolitiazin açiq cərrahi müalicəsi zamani böyrək qan dövraninin blokadasi və böyrəyin işemiyadan müdafiə üsullari / S.B. İmamverdiyev, T.A. Talibov, R.N. Məmməov [və b.] // Azərbaycan Təbabətinin müasir naliyyətləri, - Baki: - 2009. № 4, - s. 71-76.

15. İmamverdiyev, S.B. Talibov, T.A. Məmməov, R.N. [və b.]. Mərcanvari və çoxlu nefrolitiazin cərrahi müalicəsi zamani tətbiq olunan üzv saxlayici əməliyyatlarin anatomik əsaslari // Professor Zərifə Ağarza qizi Zeynalovanin anadan olmasinin75 illiyinə həsr olunmuş elmi konfransin materiallari, - Baki: - 2008, - s. 58-63.

16. İmamverdiyev, S.B. Perftoranin böyrəyin antiişemik müdafiəsindəki rolu / S.B. İmamverdiyev, R.N. Məmməov, M.Ə. Qocayev [və b.] // Azərbaycan Təbabətinin müasir nailiyyətləri, -

Baki: - 2009. № 4, - s. 18-21.

17. İmamverdiyev, S.B. Yeganə və yeganə funksiyali böyrəyin mərcanvari və çoxlu nefrolitiazinin cərrahi müalicəsi / S.B. İmamverdiyev, T.A. Talibov, R.N. Nağiyev // Saglamliq, - Baki: - №8, - s. 39-41.

18. İmamverdiyev, S.B. Sidikdaşi xəstəliyinin mini-invaziv müalicə üsullari. Metodik vəsait. / S.B. İmamverdiyev, T.A. Talibov, - Baki, - 2009. – 38 s.

19. İmamverdiyev, S.B. İkitərəfli mərcanvari və çoxlu nefrolitiazin açiq cərrahi müalicəsi / S.B. İmamverdiyev, T.A. Talibov, V.Y. Əbdürrəhimova, M.Ə. Qocayev // Cərrahiyyə, - Baki: - 2009. c. 18, №2, - s. 7-14.

20. İmamverdiyev, S.B. Mərcanvari və çoxlu nefrolitiaz zamani açiq cərrahi və müasir müalicə üsullarinin müqayisəli təhlili / S.B. İmamverdiyev, T.A. Talibov, V.Y. Əbdürrəhimova, İ.F. Mahmudov [və b.] // Azərbaycan Təbabətinin müasir naliyyətləri, - Baki: - 2009. № 6, - s. 22-27.

21. Talibov, T.A. Mərcanvari və çoxlu nefrolitiazin cərrahi müalicə zamani tətbiq olunan nefrotomik kəsiklərin böyrəyin qan dövranindan asililiği // Professor İ.M.Məmmədovun 90 illik yubileyinə həsr olunmuş elmi-praktik konfransin materiallari, - Baki: - 2010, - s. 71-73.

22. Talibov, T.A. Yeganə böyrəyin mərcanvari nefrolitiazi zamani rentgen və ultrasəs müayinələrinin klinik qiymətləndirilməsi // Azərbaycan Tibb Universitetinin 80 illik yubileyinə həsr olunmuş Beynəlxalq elmi konfransin materiallari, - Baki: - 2010, - s. 86-87.

23. Talibov, T.A. İkitərəfli mərcanvari nefrolitiazin kliniki qiymətləndirilməsi // Azərbaycan Tibb Universitetinin 80 illik yubileyinə həsr olunmuş Beynəlxalq elmi konfransin materiallari, - Baki: - 2010, - s. 40.

24. İmamverdiyev, S.B. Sidik daşlarinin tərkibinin Distansion zərbə-dalğa litotripsiyasina təsiri / S.B. İmamverdiyev, İ.F. Mahmudov, T.A. Talibov [və b.] // Cərrahiyyə, - Baki: - 2010. №4, - s. 8-12.

25. Talibov, T.A. İkitərəfli mərcanvari və çoxlu nefrolitiazin

açiq cərrahi müalicəsinin müasir aspektləri // - Baki: Cərrahiyyə, - 2010. №4, - s. 58-62.

26. İmamverdiyev, S.B. Sidik daşi xəstəliyinin yayilmasinda epidemioloji xüsusiyyətlərin təsirinə müasir baxişlar / S.B. İmamverdiyev, R.T. Hüseynzadə, T.A. Talibov // Saglamliq, - Baki: - 2010. № 6, - s.3-8.

27. İmamverdiyev, S.B. Sidik daşi xəstəliyinin yayilmasinda coğrafi xüsusiyyətlərin təsirinə müasir baxişlar / S.B. İmamverdiyev, R.T. Hüseynzadə, T.A. Talibov [və b.] // Saglamliq, - Baki: - 2010. № 6, səh. 176-179

28. Talibov, T.A. İkitərəfli mərcanvari və çoxlu nefrolitiazin açiq cərrahi müalicəsinin nəticələri // Doktorantlarin və gənc tədqiqatçilarin XV Respublika elmi konfransinin materiallari, - Baki: - 2010, - s. 104-106.

29. Имамвердиев, С.Б. Хирургическое лечение коралловианого и множественного нефролитиаза у больных нефроптозом / С.Б. Имамвердиев, Т.А. Талыбов, В.Я. Абдуррагимова [и др.] // Фундаментальные исслевовании, - Москва: - 2011. №9, ч. 1, - с. 76-81.

30. Имамвердиев, С.Б. Перфторан как метод выбора антиишемической защиты почки. Експериментальное исследование / С.Б. Имамвердиев, М.А. Годжаев, Т.А. Талыбов [и др.] // Здоровые мужчины, - Киев: - 2011. т. 39, № 4, - с. 148-150.

31. Talibov, T.A. İkitərəfli mərcanvari və çoxlu nefrolitiazin açiq cərrahi müalicəsinin xüsusiyyətləri // Türkdilli ölkələr və Türk Toplumlarinin I Tibb konqresi, Tibbdə yeni nailiyyətlər toplusu, - Baki: - 2011, - s. 291-295.

32. Имамвердиев, С.Б. Осебенности нефротомии в лечении двустороннего коралловидного и множественного нефролитиаза / С.Б. Имамвердиев, Т.А. Талыбов, Р.Н. Мамедов // Современные наукоемкие технологии, - Москва: - 2012. №5, - с. 8-14.

33. Talibov, T.A. İkitərəfli mərcanvari və çoxlu nefrolitiazin açiq cərrahi müalicəsində nefrotomiyanin rolu // Azərbaycan Səhiyyə Nazirliyi, Azərbaycan Tibb Universiteti, Elmi Tədqiqat Mərkəzi 10-cu buraxiliş «Patoloji proseslər və onlarin korreksiya üsullari», -

Baki: - 2012. – s. 93- 97.

34. Имамвердиев, С.Б. Место открытых операции в лечении коралловидного и множественного нефролитиаза / С.Б. Имамвердиев, Т.А. Талыбов // Международный журнал прикладных и фундаментальных исследований, - Москва: - 2012. №12, - с. 51-60.

35. Имамвердиев, С.Б. Наш опыт проведения открытых операций по поводу двустороннего коралловидного и множественного нефролитиаза / С.Б. Имамвердиев, Т.А. Талыбов // Фундаментальные исследования, - Москва: - 2013. т. 2, №5, - с. 413-420.

36. İmamverdiyev, C.B. Xroniki böyrək çatişmazliği ilə ağirlaşmiş ikitərəfli mərcanvari və çoxlu nefrolitiazin açiq cərrahi müalicəsi / C.B. İmamverdiyev, N.A. Талыбов // Cərrahiyyə, - Baki: - 2013. №4, - c. 51-57.

37. Имамвердиев, С.Б., Талыбов, Т.А. Мамедов, Р.Н. The features of drainage of the upper tract after open surgery for staghorn and multiple nephrolithiasis // European Urology Supplement, - 2013. v. 12, – p. 70.

38. Талыбов, Т.А. İkitərəfli mərcanvari və çoxlu nefrolitiazin müalicəsində açiq cərrahiyyənin əsas aspektləri / - Baki: Saglamliq, - 2013. № 3, - s. 57-62.

39. Талыбов, Т.А. İkitərəfli mərcanvari və çoxlu nefrolitiazin açiq cərrahi müalicəsində əməliyyatönü hazirliğin əsas xüsusiyyətləri // - Baki: Saglamliq, - 2013. № 4, - s. 100-105.

40. Имамвердиев, С.Б. Особенности дренирования верхних мочевых путей при хирургическом лечении коралловидного и множественного нефролитиаза / С.Б. Имамвердиев, Т.А. Талыбов, Р.Н. Мамедов // Клиническая Медицина, - Москва: - 2014. № 1, - с. 45-50.

41. Imamverdiev, S.B. Surgical treatment of staqhorn and multiple nefrolitiazis, European Urology Supplement / S.B. Imamverdiev, T.A. Talibov TVol 12., Issue 3. 10-12 September., 2015. P 65.,

42. Имамвердиев, С.Б. Выбор оперативного метода у болъных коралловидным нефролитиазом / С.В. Имамвердиев,

Т.А. Талыбов // Урология, - Москва: - 2016. №2, - с. 18-23.

43. İmamverdiyev, S.B. Yeganə və yeganə funksiyali böyrəyin mərcanvari və çoxlu nefrolitiazin aciq cərrahi müalicəsinin nəticələri / S.B. İmamverdiyev, T.A. Talibov // Azərbaycan Tibb Jurnali, 2016-№3, - s. 28-34.

44. Talibov, T.A. Ikitərəfli mərcanvari və çoxlu nefrolitiazin cərrahi müalicə üsullari // - Baki: Saglamliq, - 2017. № 4, - s.58-63.

45. Məmmədov, E.N. Böyrəklərin işemiya reperfuziya zədələnməsi zamani Rolipram superoksid dismutazatəsirinin antiişemik xüsusiyyətlərinin eksperimentdə öyrənilməsi / E.N. Məmmədov, T.A. Talibov // Saglamliq, - Baki: - 2017. № 4, - s.152-157.

46. Talibov, T.A. Yeganə və yeganə funksiyali böyrəyin mərcanvari və çoxlu nefrolitiazin aciq cərrahi müalicə üsullari // - Baki: Saglamliq, - 2017. № 5, - s. 53-58.

47. Имамвердиев, С.Б. Результаты открытого хирургического лечения двустронного королловидного и множественного нефролитиаза / С.Б. Имамвердиев, // Казанский медицинский журнал, - Казань: -2018. т. XCIX, № 4, - с. 722-729.

48. Имамвердиев, С.Б. Антиишемическая защита при открытых операциях по поводу коралловидного нефролитиаза / С.Б. Имамвердиев, Т.А. Талыбов // Сибирский медицинский журнал, - Иркутск: - 2018. №4, - с. 50-53.

49. Имамвердиев, С.Б. Случай открытого хирургического лечения коралловидного нефролитиаза у пациента с дефицитом VII фактора / С.Б. Имамвердиев, Т.А. Талыбов, Э.А. Гадимова [и др.] // Казанский медицинский журнал,- Баку: - 2019. т. 100, № 5, - с. 828-831.

50. Талыбов Т.А Результаты открытого хирургического лечения двустронного королловидного и множественного нефролитиаза. Теоретические и прикладные вопросы науки и образования 2020, Тамбов, Част1, ст106.

List of abbreviations

AN – anatrophic nephrolithotomy
ARF – Acute renal failure
CFR – Chronic renal failure
CMN – coral and multiple nephrolithiasis
CMS – coral and multiple stones
CN – coral nephrolithiasis
CPS – calyces pelvis system
CT – computed tomography
ESR – erythrocyte sedimentation rate
ESWL – extracorporal shock wavelithotripsy
EU – excretory urography
HNSE – Hydronephrosis and non- stone etiology
PNLT – percutaneous nephrolithiasis trypsin
PVS – pelvis ureteric segment
UL – Urolithiasis
US – ultrasonography

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