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Ureteric stent in renal transplantation: to be or not to be?

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Key words: Kidney Transplantation, Allografts, Urinary Fistula, Stents.

Urological complications after kidney transplantation is still now one of the main reasons of worsening operation results. Most surgeons pay a lot of attention to the urinary fistulae. At verifiable urinary fistulae the next tactics significantly depends on the presence of urinary stent.

Subject of the work: to study the effectiveness of implantation as for double J-stents at kidney transplantation for prophylaxis of urinary fistulae.

Materials and methods. The analyzed results of kidney transplantation among 66 patients from 2012 to 2016. There were 37 (56.1 %) men, the average age of patients was 33.4±12.4 years. All the patients on early after surgical period were done the monitoring of clinic-biological indexes, ultrasonic examination with scanning of renal allograft. As for the aim of the work all the patients were divided into two groups.

The main group included 35 (53 %) recipients with kidney allografts, everyone of them was set uretero-bladder anastomosis on the double J-stent during the period from 11.2013 to 06.2016. The average age of patients was 32.6±9.2 years, there were 17 (48.6 %) men, 18 women (51.4 %).

Controlling group involved 31 (47 %) patients. During the period from 01.2012 to 10.2013 at kidney transplantation urinary stents were not used among the patients. The average age of recipients was 34.3±15.3 years, there were 20 (64.5 %) men, 11 women (35.5 %).

Results. According to the analysis of our clinic material the implantation of J-stent at kidney transplantation for prophylaxis of urinary fistulae is reliably ($p<0.05$) effective. In our research there is no connection ($p>0.05$) with the infection of urinary tracks with the presence of urinary stent.

Conclusions. Implantation of J-stent is effective and safe method of surgical prophylaxis of urinary fistulae and it can be routinely applied at kidney transplantation.

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Сечовідний стент при трансплантації нирки: бути чи не бути?

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Урологічні ускладнення після трансплантації нирки залишаються однією з основних причин погіршення результатів операції. Більшість хірургів приділяють найпильнішу увагу сечовим затьокам. Під час верифікованого сечового затьоку подальша тактика більшою мірою залежить від наявності сечовідного стенту.

Мета роботи – вивчити ефективність імплантації подвійних J-подібних сечовідних стентів при пересадці нирки для профілактики сечового затьоку.

Матеріали та методи. Проаналізовані результати трансплантації нирки 66 хворих за період 2012–2016 рр. Чоловіків було 37 (56,1 %), середній вік – 33,4±12,4 року. Всім пацієнтам у ранньому післяопераційному періоді виконувався моніторинг клініко-біохімічних показників, ультразвукове дослідження з дуплексним скануванням ниркового алотрансплантату. Згідно з метою роботи пацієнти були поділені на дві групи. Основну групу становили 35 (53 %) реципієнтів ниркового алотрансплантату, яким у період з 11.2013 по 06.2016 р. сечовідно-міхуровий анастомоз формували на подвійному J-подібному сечовідному стенті. Середній вік пацієнтів – 32,6±9,2 року, чоловіків було 17 (48,6 %), жінок – 18 (51,4 %). Контрольна група включала 31 (47 %) пацієнта, яким у період з 01.2012 по 10.2013 р. під час трансплантації нирки сечовідні стенти не застосовували. Середній вік реципієнтів – 34,3±15,3 року, чоловіків було 20 (64,5 %), жінок – 11 (35,5 %).

Результати. Згідно з аналізом нашого клінічного матеріалу імплантація подвійного J-подібного сечовідного стенту під час пересадки нирки для профілактики сечового затьоку є вірогідно ($p<0,05$) ефективною. У нашому дослідженні відсутній зв'язок ($p>0,05$) інфекції сечовідільних шляхів із наявністю сечовідного стенту.

Висновки. Імплантація подвійного J-подібного сечовідного стенту – ефективний і безпечний метод хірургічної профілактики сечового затьоку та може рутинно застосовуватися при пересадці нирки.

Ключові слова: трансплантація нирки, алотрансплантати, сечовий затьок, стенти.

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Мочеточниковый стент при трансплантации почки: быть или не быть?

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Урологические осложнения после трансплантации почки остаются одной из основных причин ухудшения результатов операции. Большинство хирургов уделяют самое пристальное внимание мочевым затёкам. При верифицированном мочевом затёке дальнейшая тактика в большой степени зависит от наличия мочеточникового стента.

Цель работы – изучить эффективность имплантации двойных J-образных мочеточниковых стентов при пересадке почки для профилактики мочевого затёка.

Материалы и методы. Проанализированы результаты трансплантации почки 66 больных за период 2012–2016 гг. Мужчин было 37 (56,1 %), средний возраст пациентов – 33,4±12,4 года. Всем пациентам в раннем послеоперационном периоде выполнялся мониторинг клинико-биохимических показателей, ультразвуковое исследование с дуплексным сканированием почечного аллотрансплантата.

Согласно цели работы пациенты были разделены на две группы. Основную группу составили 35 (53%) реципиентов почечного аллотрансплантата, которым в период с 11.2013 по 06.2016 г. мочеточниково-пузырный анастомоз формировали на двойном J-образном мочеточниковом стенте. Средний возраст пациентов был 32,6±9,2 года, мужчин – 17 (48,6 %), женщин – 18 (51,4 %). Контрольная



группа включала 31 (47 %) пациента, у которого в период с 01.2012 г. по 10.2013 г. при трансплантации почки мочеточниковые стенты не использовались. Средний возраст реципиентов составил $34,3 \pm 15,3$ года, мужчин – 20 (64,5 %), женщин – 11 (35,5 %).

Результаты. Согласно анализу нашего клинического материала имплантация двойного J-образного мочеточникового стента при пересадке почки для профилактики мочевого затёка является достоверно ($p < 0,05$) эффективной. В нашем исследовании отсутствует связь ($p > 0,05$) инфекции мочевыводящих путей с наличием мочеточникового стента.

Выводы. Имплантация двойного J-образного мочеточникового стента является эффективным и безопасным методом хирургической профилактики мочевого затёка и может рутинно применяться при пересадке почки.

Ключевые слова: трансплантация почки, аллотрансплантаты, мочевого затёк, стенты.

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The risk of surgical complications is the highest one during the first days after the operation. Surgical complications have a big influence on the direct results of transplantation itself [1,2]. So, annual survival of kidney allografts without presence of surgical complications is 93 %, with their presence is 75 % [3].

Urological complications after kidney transplantation is still now one of the main reasons of worsening operation results. The most frequent complications are urinary fistulae, stenosis and inability of neoanastomosis which can be found among 4–30 % of recipients. At the same time they are the cause of death among nearly 50 % of patients. A lot of authors link it with the dystrophic processes in the wall of bladder caused by the fact that it does not work during long period of time [4].

Most surgeons pay a lot of attention to the urinary fistulae. This kind of urological complication after transplantation can be seen among 1.5–4 % of recipients. As a rule, urinary fistulae develops during the early time period after transplantation, on the background of the most aggressive starting immunosuppression and that is why they are the most dangerous as for septic complications [5].

In turn, joining infectious-septic component in the urinary fistulae creates additional danger for arrosion of vascular anastomosis. Performing surgical interference with the aim of reconstruction of urinary tract on a such unfavourable background also ends the development of secondary complications [5,6].

At verifiable urinary fistulae the next tactics significantly depends on the presence of urinary stent. If there is a drainage in the wound, urinary catheter and J-stent, the mentioned drainages are in the wound till the stopping of urine leaking from it. If there is no drainage in the wound, puncture drainage will perform. For lack of putting stent and catheter, if it is possible to localise fistula, it is worth trying nephrostomy and/or vesical catheter and double J-stent. In case if the conservative tactics is not successful during three weeks, open surgical interference with reconstruction of urinary tract mainly on the urinary stent must be done [1,6–9].

The effectiveness of using double J-stents with prophylactic aim is controversial and requires the following studying.

Subject of the work: to study the effectiveness of implantation of double J-stents at kidney transplantation for prophylaxis of urinary fistulae.

Object of study and methods of investigation

During the period from 2012 to 2016, 66 patients were done kidney transplantation in the clinic of transplantology of State establishment: «Zaporizhzhia Medical Academy of Postgraduate Education. Ministry of Health Protection in Ukraine» on the

base of interregional centre of transplantology. There were 37 (56.1 %) men, the average age of patients was 33.4 ± 12.4 years. Monitoring of clinic-biological indexes, ultrasonic examination with scanning renal allografts were done among all the patients on early after surgical period.

In all cases neoureterovesicostomia with anti-reflux protection was formed followed by the methods, developed in the clinic [10]: the bottom of a bladder was picked out from the paravesical adipose tissue, muscular layer and mucous membrane were being dissected throughout 1.5 cm, uretero-bladder anastomosis was formed by putting the continual stitch with the suture which resolves itself. Between muscular layer of the bladder, the edge of anastomosis and the part of ureter above 7–9 mm from the angle of anastomosis two additional ligatures were setting. The ureter valve of donor kidney was formed at closing the ligatures. Ligatures were put in the back part of anastomosis. Muscular-muscular stitch on the bladder was set above the zone of anastomosis.

As for the aim of the work all the patients were divided into two groups:

The main group included 35 (53 %) recipients with kidney allografts, everyone of them was set uretero-bladder anastomosis on the double J-stent during the period from 11.2013 to 06.2016. The average age of patients was 32.6 ± 9.2 years, there were 17 (48.6 %) men.

Controlling group involved 31 (47 %) patients. During the period from 01.2012 to 10.2013 at kidney transplantation urinary stents were not used among the patients. The average age of recipients was 34.3 ± 15.3 years, there were 20 (64.5 %) men.

Continual normally divided records were shown with the average value and standard deviation ($M \pm SD$). For the description of frequency data the percentages were used, the differences among groups were valued with the help of χ^2 -test and Fisher's exact test. Statistical data processing was done with the help of crosstabs analysis, disperse and correlational analysis.

All types of analysis were performed with the usage of programmes of statistical analysis Microsoft Office Excel 2007 i "Statistica 6,0" for Windows (StatSoft. Inc., USA) v.6.1 license № AXXR712D833214FAN5. Differences between groups, prognostic value of criterion, correlational dependence were reliable at $P < 0.05$. In all cases values P were bidirectional.

Results and their discussion

According to the analysis of our clinic material the implantation of J-stent at kidney transplantation for prophylaxis of urinary fistulae is reliably ($p < 0.05$) effective (Tables 1, 2).

Necessity of implantation double J-stents at kidney transplantation is under discussion as for literature data.

Some authors think that at renewal continuity of urinary tracks with the usage of urinary stent, probability of urinary



Table 1

Characteristic of comparing groups

Data, unit of measurement	Main group (n=35)	Controlling group (n=31)
Patient with obesity, n (%) (BMI>30 kg/m ²)	2 (5.7 %)	2 (6.5 %)
Deceased donor, n (%)	8 (22.9 %)	8 (25.8 %)
Living unconnected organ donor (husband or wife), n (%)	4 (11.4 %)	4 (12.9 %)
Neoureterovesicostomia on the urinary stent, n (%)	35 (100 %)	0 (0 %)
Urinary fistulae, n (%)	0 (0 %)*	4 (12.9 %)*
True bacteriuria (>/105 colonies/ml), n (%)	3 (8.6 %)	2 (6.5 %)

Note: * – differences between groups are statistically significant (p<0.05).

Table 2

Characteristic of patients with urinary fistulae

Risk factors, unit of measurement	Patients with urinary fistulae n=4
Patient with obesity, n (%) (BMI >30 kg/m ²)	0 (0 %)
Deceased donor, n (%)	1 (25 %)
Living unconnected organ donor (husband or wife), n (%)	0 (0 %)
Neoureterovesicostomia without urinary stent, n (%)	4 (100 %)
Day of appearing urinary fistulae after kidney transplantation, day	19.0±18.2

complications is less significantly than at without J-stent anastomosis [11–16].

During early post operational period it is possible to find urinary fistulae in 3–5 % cases, when double J-stents are not used [8].

A double J-stent may be placed to protect the anastomosis, particularly in cases of tricky anastomoses. Several transplant

groups use a double J-stent routinely (6–8) and remove it 2–4 weeks later (level of evidence: 2b). Absolute evidence for using double J-stents is too short or bad vascularized ureter (in that case uretero-uretero anastomosis is used), transplantation of the third graft or among children (level of evidence: 3) [8].

In accordance to the literature data, implantation of urinary stents can cause the infection of urinary tracks [17–19]. Another sources refute this statement [13–16,20] and indicate to the connection of true bacteriuria (>/105 colonies/ml [21]) after kidney transplantation not with the presence of stent but among the female recipients, long usage of bladder catheter and postponed function of renal allograft [14,15].

In our research there is no connection (p>0.05) of urinary tracks' infection with the presence of urinary stent (Table 1).

Some authors think that it is essential to use urinary stents only among the patients with obesity (body mass index – BMI>30kg/m²), at deceased organ donation and among the recipients with renal allograft from living unconnected organ donor [18,22].

According to our data, recipient's obesity, kidney allograft from deceased or living unconnected organ donor do not influence (p>0.05) on the frequency of formation of urinary fistulae (Tables 1, 2).

So, implantation of double J-stent is effective and safe method of surgical prophylaxis of urinary fistulae and it can be routinely applied at kidney transplantation.

Conclusions

1. Formation of neoureterovesicostomia on urinary stent at kidney transplantation is effective and safe method of surgical prophylaxis of urinary fistulae .

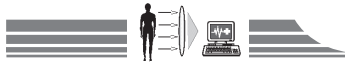
2. Urinary tracs' infection after transplantation is not linked with the presence of urinary stent.

3. Implantation of a double J- stent can be routinely used at kidney transplantation.

Conflicts of Interest: authors have no conflict of interest to declare.

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