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ANNIVERSARY

50th Anniversary of the First Kidney Transplantation in Bratislava

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The idea of replacing a damaged, sick or destroyed organ with a healthy one, hereby saving life or restoring the health of the diseased person is not new. In 1902, Alexis Carrel wrote in Lyon Chirurgical that organ transplantations that at that time meant chirurgical curiosity may one day become a practical possibility how to substitute diseased organs.

Organ transplantations are one of the greatest achievements of the biological and medical sciences of the 20th century. Kidney transplantation represents a significant milestone in the history of medicine. It will forever remain the first successful organ transplantation, on the basis of which the entire multidisciplinary field has grown – transplantology.

The development of transplant medicine at the beginning of the 20th century was linked to advances in vascular surgery and immunogenetics. The Frenchman Alexis Carrel made a significant contribution to the development of transplant medicine in 1908 when he solved the problem of the vascular suture. This enabled a reliable connection of the vessels of the transplanted kidney with the vessels of the recipient. In 1912, Carrell was awarded the Nobel Prize for Medicine.

A significant discovery that enabled a marked progress in the field of organ and tissue transplantations was the work of Peter Medawar on the fundamentals of the recipient's immune response against transplanted organ published in 1945. In 1958, Jean Dausset described the leukocyte antigens that underlie the HLA system allowing to test transplant compatibility between the donor and recipient.

Intensive scientific research in the field of nephrology and immunology finally led to the first successful kidney transplantation between monozygotic twins in Boston, USA, in 1954.

In the 60's and 70's, the development of kidney transplantation was conditioned by improving the knowledge and by advances in dialysis equipment technology, transplant immunology, professional and legal recognition of the concept of brain death supported by Christian church authorities, improving the effectiveness and toxicity of immunosuppressive therapy and kidney conservation methods.

A prerequisite for a successful transplant program is an efficient and effective organ collection system. Organ retrieval is a team activity, kidney harvesting and transplantation being an issue closely related to enthusiasm, emotions, ethics and morality, not only medical but also religious, where faith, love and mutual respect play extremely important roles. Medicine and faith together help suffering people to overcome their problems.

The basis of every transplant program is the collection and transplantation of kidneys from dead donors. Collection and transplantation of kidneys from living donors do not solve the problem of the lack of suitable kidneys for transplantation purposes.

However, for many patients, kidney transplantations from living related donors are a welcome alternative. The results of related kidney transplants, especially the long-term survival of the grafts, are better than the results of kidney transplants from dead donors due to the biological similarity of the donor's and recipient's tissues. For the collection of kidneys from dead and living donors, strict legislative and medical procedures are established.

The first kidney transplant in the former Czechoslovakia was performed in Hradec Králové in 1961. A systematic clinical transplant program began 5 years later at IKEM in Prague.

In Slovakia, Pavol Steiner and Emil Matejíček worked in the field of organ transplants in experimental animals as early as in the 1960s. Vladimír Zvara and his colleagues accomplished the first successful kidney transplantation in Slovakia at the Department of Urology of the Faculty of Medicine in Bratislava in 1972. The patient lived with a well-functioning kidney transplant for 8 years.

The first kidney transplant was the termination of the joint efforts and collaboration of urologists, nephrologists, immunologists, anesthesiologists, neurologists, pathologists and other specialists. At a time when kidney transplantation was a new and risky method of treating chronic renal failure, Professor Zvara was willing and able to take on his shoulders a huge medical and social responsibility. With increasing experience, the program expanded to include also kidney transplantation in children (1973), diabetics (1978),

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kidney transplantation from relatives (1989) and kidney transplantation in patients with lower urinary tract abnormalities. Professor Zvara educated experts who were subsequently willing and able to take over the baton from him and continue the demanding work, which undoubtedly influenced the level and further development of health care and medical science in Slovakia.

The cooperating workplaces also benefited from the wide interdisciplinary cooperation, not only by expanding their own field, but also by acquiring new topics for scientific and publishing activities and subsequently also for obtaining scientific degrees.

Transplantology also led to an increase in the level of Slovak urology. Conversely, urology significantly contributed to the development of transplantology. Transplantology has taken over from urology best methods of urine diversion, lower urinary tract reconstruction, percutaneous kidney surgery, etc. On the other hand, transplantology brought new forms of activity to urology and expanded its technical scope (retroperitoneal surgery, autotransplantation of the kidney in lesions of the distal ureter, extracorporeal surgery of the kidney in tumours with its subsequent autotransplantation). The same applies to the relationship between transplantology and nephrology, immunology, cardiology, hepatology and other disciplines.

Kidney transplantation is an allotransplantation, thus organ transfer between individuals of the same species. Autotransplantation means its transfer from the original position to the pelvis, most often due to an afflicted renal artery or injured ureter.

In recent decades, the surgical side of heterotopic kidney transplantation has not changed much. The technique is used described by the French urologist René Küss in the 1950s. Small differences in surgical technique and tactics are due to the tradition and experience of a particular transplant centre. The kidney is inserted extraperitoneally into the foss iliaca and its vessels are sutured to the iliac vessels. In the orthotopic kidney transplantation described by the Spanish urologist Gil-Vernet, the kidney is inserted into the bed after the removed patient's own left kidney. The renal vein of the transplanted kidney is sutured to the vein stump of the removed own kidney and the renal artery is sutured to the splenic artery. Urinary tract reconstruction is performed by anastomosis of the patient's own ureter with the pelvis of the transplanted kidney.

Urinary tract reconstruction is an integral part of kidney transplantation. The aim of urinary tract reconstruction is to ensure optimal and socially most acceptable drainage of urine from the transplanted kidney. Urinary tract reconstruction significantly affects not only the quality of life of the patient after kidney transplantation but also the function and survival of the transplanted kidney and the patients themselves.

Complications encountered during kidney transplantation or in the postoperative period are not fundamentally different from the events accompanying other demanding surgical procedures. However, their progression is usually modified due to a number of adverse circumstances in the kidney recipient (uraemia, dialysis treatment with administration of anticoagulants, immunosuppression). A separate chapter among surgical complications after kidney transplantation consists of urological complications, which are related to urinary tract reconstruction and belong to the most serious complications after kidney transplantation. Not only can they cause the loss of the transplanted kidney, but they can also directly endanger the patient's life.

The number of kidney transplants worldwide is growing by about 4 % every year, and the number of patients on the waiting list for kidney transplants is increasing by 10–20 % every year. Kidney transplantations achieve very good results. One year after transplantation, more than 90 % of transplanted kidneys survive and function, and more than 95 % of patients survive. In terms of long-term outcomes, it is not uncommon for a well-functioning transplanted kidney to survive beyond the age of 20. In comparison, the annual mortality of patients on dialysis and on the waiting list for kidney transplantation is 6.3 %. Kidney transplantation significantly increases the quality of life of patients and enables their effective medical, occupational, family and sexual rehabilitation. Kidney transplantation has indisputable medical, social and economic advantages compared to other methods of treating chronic renal insufficiency.

The results of kidney transplants achieved at the Department of Urology in Bratislava in 50 years are the fruits of the joint work of doctors and nurses, colleagues and co-workers from other specializations. Educated, experienced and dedicated nurses working at the Department Urology in Bratislava deserve our sincere thanks and gratitude for their difficult and responsible work.

The successful and functioning kidney transplant program in Slovakia is a proof of effective collegial cooperation of experts in several medical specializations. However, the number of transplants in Slovakia is still insufficient despite a significant increase in transplant activity in recent years. Only intensive cooperation and communication of transplant centre doctors with the doctors involved in the identification of potential organ donors – anesthesiologists, neurologists, traumatologists, radiologists and experts in other specializations – can improve this situation. For this purpose, the function of transplant coordinators was created. Highly important aspects of the transplant program are also the understanding of the uninterested medical and layman's public, continuous lifelong education of doctors in the field of kidney collection and transplantation, as well as the education of the patients included in the waiting list for kidney transplantation.

References

1. Breza J st, Žilinská Z. Transplantácie obličiek. 375–382. In: Princípy chirurgie IV. Breza J et al (Eds). Slovak Academic Press, s.r.o, Bratislava 2015, 1296 p.

2. Breda A, Budde K, Figueiredo A, Lledo Garcia E, Olsburgh J, Regele H. EAU Guidelines on renal transplantation. 400–421. EAU Guidelines, 2019.

3. Breza J ml, Žilinská Z et al. Transplantácia obličky. Cofin, Prešov, 2020, 289 p.

4. Navrátil P. Praktická urologie u nemocných v dialyzační léčbě, před a po transplantaci ledviny. Hradec Králové, Olga Čermáková, 2005, 199 s.

5. Kuss R, Bourger P. An illustrated history of organ transplantation. The great advanture of the century. Laboratoires Sandoz, Rueil-Malmaison, France, 1982, 175 p.

6. Zvara V, Řezníček J. Možnosti aktívnej liečby terminálneho štádia chronickej nedostatočnosti obličiek chronickou hemodialýzou a transplantáciou obličky. Lek Obzor 1973; 22: 489–495.

7. Porter R. Dějiny medicíny. Od starověku po současnost. Praha, Prostor s.r.o, 2015, 807 p.

8. Zákon č. 317/2016 Z.z. o požiadavkách a postupoch pri odbere a transplantácii ľudského orgánu, ľudského tkaniva a ľudských buniek a o zmene a doplnení niektorých zákonov. https: //www.slov-lex.sk/pravne-predpisy/SK/ZZ/2016/317/20170201.

9. Lentine KL, Kasiske BL, Levey AS et al. KDIGO Clinical Practice Guideline on the Evalution and Care of Living Kidney Donors. Transplantation 2017; 101 (Suppl. 8): 7–105.

10. Breza J, Zvara V, Řezníček J. Faktory ovplyvňujúce kvalitu obličiek použitých pre transplantáciu. Rozhl Chir 1984; 63: 228–233.

11. Breza J, Řezníček J. Príprava kadaveróznych darcov pre odber obličiek a technika odberu obličiek en bloc. Rozhl Chir 1985; 64: 767–774.

12. Baláž P, Janek J, Adamec M et al. Odběry organu k transplantaci. Odbery orgánov na transplantácie. Univerzita Kalova v Praze. Praha, Karolinum, 2011: 25.9.

13. Beňa Ľ et al. Manuál transplantačného koordinátora. Martin, Osveta, 2010: 84.

14. Breza J ml, Frohlich R, Žilinská Z, Breza J st. Urologické komplikácie po transplantácii obličky. Ces Urol 2019; 23 (3) : 203–220.

15. Breza J ml, Žilinská Z, Bujdák P, Breza J st. Urologické komplikácie po transplantácii obličky. Urol Listy 2009; 7 (1): 38–48.

16. Breza J ml, Žilinská Z, Sersenová M et al. Diagnostika a liečba urologických komplikácií po transplantácii obličky. Lek Obzor (Med Horizon) 2018; 67 (1): 19–24.

17. Breza J ml, Žilinská Z, Sersenová M, Chrastina M, Trebatický B, Breza J st. Urologické komplikácie po transplantácii obličky. Monitor medicíny SLS 2018; 8 (1–2): 9–12.

18. Kolombo J, Hanuš T. Chirurgická anatomie retroperionea, s. 3–12. In: Hanuš T, Novák K et al. Nemoci močovodu. Praha, Galen, 2008, 170 p.

19. Žilinská Z, Breza J ml, Sersenová M et al. Skorá diagnostika a liečba cievnych komplikácií po transplantácii obličky. Lek Obzor 2018; 67 (2): 57–62.

20. Žilinska Z, Chrastina M, Trebatický B et al. Vascular complications after renal transplantation. Bratisl Med J 2010; 111: 586–589.

21. Breza J. Budúcnosť urológie. 368–374. In: Jan Evangelista Purkyně, jeho význam pro současnou i budoucí medicinu. Ed. Svačina Š. Praha, Mladá fronta, 2017, 515 p.

22. Trunečka P. Současnost a budoucnost orgánových transplantací. 442–453. In: Jan Evangelista Purkyně, jeho význam pro současnou i budoucí medicinu. Ed. Svačina Š. Praha, Mladá fronta, 2017, 515 p.

23. International donation and transplantation activity. Organs Tissues & Cells 2012; 15: 147.

24. Viklický O, Janoušek L, Baláž P et al. Transplantace ledviny v klinické praxi. Praha, Grada Publishing as, 2008, 380 p.

25. Niederland TR. Transplantácie: Horor rozhodovania, s. 151–152. In: Szelepcsenyi J. Nedýchajte, prosím. Rozhovory s akademikom Niederlandom. Bratislava, TANKRED, 2000, 286 p.

26. Podracká Ľ. Transplantácie obličiek u detí. 766–770. In: Nefrológia. Ed. Dzúrik R, Šašinka M, Mydlík M, Kovács L. Bratislava, Herba, 2004, 877 p.

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