

YURI VORONOV - AT THE BEGINNING OF A LONG WAY

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Neither a 26-year-old female patient, who was admitted on March 31, 1933 in the state of anuria after being poisoned by mercuric chloride nor a moribund patient admitted three days later with a fracture of the skull base could not know that they were destined to go down in history. That happened due to 38-year-old surgeon Yuriy Yuryevich Voronoy, who at first carried out the world's first cadaveric donor nephrectomy for transplantation and then accomplished the world's first cadaveric renal transplantation in a human on April 3, 1933. Despite the fact that the patient died two days later, the operation is considered successful because the kidney entered the blood circulation and started functioning. The reasons for graft failure are clear: donor kidney had a very long time of warm ischaemia, kidney and patient were mismatched in their blood groups. Voronoy believed that a short-term graft functioning doesn't compromise the transplantation as a treatment method. He believed that in the case of death of the first transplant (because of high mercury concentration) it was necessary to perform a re-transplantation. This renal graft exemplar is still stored at the Department of Pathological Anatomy of National Medical University in Kharkov.



Yurii Voronoy, 1896-1961

The decision to make a kidney transplantation in clinic was not spontaneous. Y.Y. Voronoy had already spent several years on organ transplantation problem - scientific researches and experiments on animals: 1929 – «The role and significance of specific complement-fixing antibodies in testicles transplantation», 1930 - a successful kidney transplant in the experiment on a dog, 1931 – «Specific complement-free antibodies in a kidney transplant using vascular suture» and others.

The scientist, in fact, developed the postulates of modern transplantology, concluding that "... the reason of renal graft rejection is the local mesenchyme and general immunobiological reactions as forming specific antibodies that cause transplant rejection." Also the conclusions were prophetic, that "... cadaveric organs can survive and function within a certain time (especially by washing with a solution of Ringer-Lock) as well as remain sterile" and that "the kidneys of fresh corpses are able to come alive and able to function during a transplantation into a new owner." In addition, the scientist refuted the theory of the so-called "cadaveric poison" in practice, which in those years was common among doctors: "There is no doubt that cadaveric organs during transplantation don't give any specific toxicity or anaphylaxis."

During this historical operation Voronoy followed the hypothesis that under the pathological condition of the body resulting from severe poisoning, the body's ability to reject the transplant would be greatly reduced. At the same time the kidney disease in a state of mercuric chloride poisoning "was unquestionable clinical indication for transplantation of that organ." The author considered the transplantation as "temporary substitutional effect." Transplanted kidney had to provide an enhanced removal of the poison and the replacement of damaged kidneys' functions. "As the result of this Voronoy deliberately did not take into account the factors of tissues and organs compatibility, he even ignored the blood group differences. It's interesting that Voronoy refused to take an organ from an alive person, considering that "you shouldn't cause a deliberate disability to a healthy man, cutting a necessary organ for transplantation for the sake of the problematic patient's rescue." So he decided to use a kidney taken from a corpse.



View of the completed first kidney transplantation

Voronoy continued his work and later reported on two successful cadaveric kidney transplantations. In spite of the fact that the grafts functioned from 4 to 7 days and then they were removed, patients experienced an episode of acute renal failure and were discharged from the hospital.

The uniqueness of this man was the fact that on the one hand, Voronoy's bold experiments were far ahead of their time and on the other side they set the vector to transplantation development. As a result, a kidney transplant came into a clinical practice only after 20-30 years, when the level of such areas as immunology and pharmacology reached the required one. Thus, Y.Y. Voronoy put the beginning for a long way from the bold experiment to routine use of a kidney transplant as the best type of renal replacement therapy.

