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Favorable outcome of pregnancy in a kidney and pancreas recipient

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Abstract

The patient's anamnesis, the peculiarities of the course of pregnancy, delivery in a kidney and pancreas recipient have been described. The results of the patient's follow-up for nine months after delivery are presented. The authors emphasize that the management of pregnancy in a woman after organ transplantation is possible only with the effective interaction of obstetricians, gynecologists, and transplantologists.

Keywords: pregnancy, kidney transplantation, pancreas transplantation, diabetes mellitus, diabetic nephropathy, fertility, hepatopancreatobiliary area

Conflict of interests Authors declare no conflict of interest

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USE, Ultrasound examination

Rationale

At the beginning of the 21st century, the number of patients diagnosed with diabetes mellitus in the world was 171 million people, while, according to forecasts, their number may soon double to 366 million people [1]. The leading cause of death from diabetes mellitus is cardiovascular system diseases, and diabetes mellitus is also the cause of the end-stage chronic kidney disease [2].

Pancreas transplantation is the best surgical treatment for severe difficult-to-control type 1 diabetes mellitus [3]; the operation is indicated in cases where the risk of developing the listed complications of diabetes mellitus exceeds the risk of side effects due to immunosuppressive therapy [4], and in case of kidney failure progression, the method of choice is a combined kidney and pancreas transplantation [5].

Currently, in the Russian Federation, pancreas transplantation is performed only in a few centers for organ transplantation, one of which is the *Volga District Medical Center* (hereinafter referred to as VDMC) of the Federal Medical and Biological Agency of Russia [6–7]. The organ transplantation program at VDMC started in 2006; and in 2009, the Volga Coordinating Center for Organ and Tissue Donation was established, which made it possible to perform the first pancreas transplantation in the region in

2016 [8]. Over the years, a team of specialists has been formed, bringing together surgeons, anesthesiologists, therapists, radiology doctors who prepare patients for surgery, perform organ transplantation, and further out-patient follow-up of the recipients. The established system made it possible to ensure the pregnancy management for a woman after simultaneous kidney and pancreas transplantation performed at VDMC. The purpose of this article is to present a clinical case report of pregnancy management in a kidney and pancreas recipient.

Clinical Case Report

Patient V., born in 1995, without any specific conditions in family health history, in her childhood had no significant specific features in development and condition until the age of 10 years old. At that age, the diagnosis of type 1 diabetes mellitus was first made, and insulin replacement therapy was administered. From 2017, there was an increasing azotemia level, and against the persistent febrile fever, the examination revealed carbuncles of the kidneys; a right-sided nephrectomy and decapsulation of the left kidney were performed. In 2018, the end-stage renal failure developed for which the renal replacement therapy was started using the program hemodialysis. In December 31, 2019, she was placed on the VDMC waiting list for pancreas and kidney transplantation.

In March 2019, the patient was admitted at VDMC for organ transplantation. Diagnosis at admission was as follows: “Type 1 diabetes mellitus (target HbA1c <7.5%), severe course complicated by diabetic nephropathy in the end-stage renal disease corrected by the program hemodialysis since 2018. Condition after right nephrectomy in 2017, left decapsulation due to kidney carbuncles, urosepsis. Reflux pyelonephritis of

the single left kidney, after stenting. Diabetic proliferative retinopathy, polyneuropathy. Erythropoietin-dependent anemia. Myocardial dystrophy of mixed origin, sinus tachycardia, NYHA Class I.

On March 14, 2019, when the donor organs were found from a post-mortem donor, a simultaneous pancreas and kidney transplantation was performed (Fig. 1). The function of the transplanted organs was immediate.

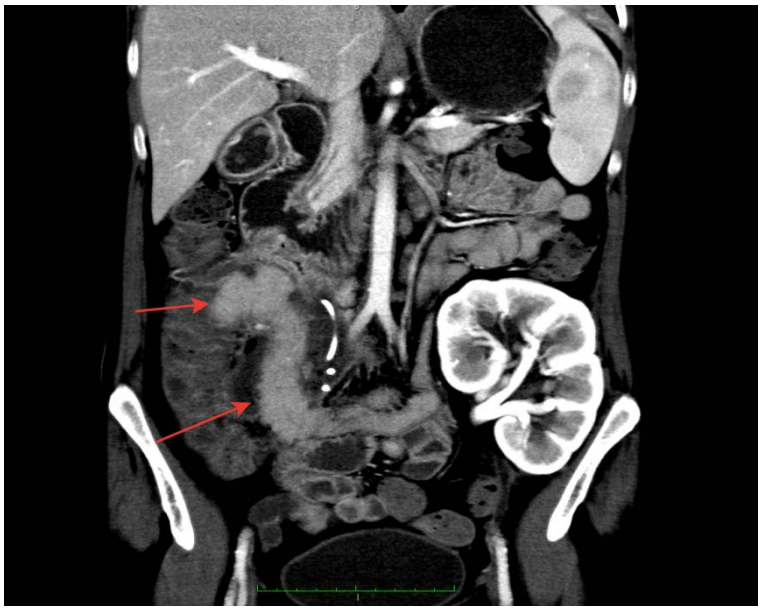

Fig. 1. Multislice spiral computed tomogram of the abdominal cavity

The early postoperative period was complicated with lymphorrhea and urinary tract infection. In addition, there was a small intestine obstruction, which required surgical intervention. In this regard, the patient was discharged from the hospital only on June 26, 2019, for the follow-up of a transplant doctor of the VDMC Outpatient Center for Transplantology and Hepatology. The patient was recommended to take the following medications on an ongoing basis: tacrolimus 5.5 mg, twice a day, mycophenolic acid 360 mg, twice a day, and methylprednisolone 4 mg, once

a day.

During the first year after kidney and pancreas transplantation, the patient made multiple visits to the doctors of the Outpatient Transplant Center due to exacerbation of transplanted kidney pyelonephritis caused by Klebsiella pneumoniae, which required a temporary reduction of immunosuppressive therapy (mycophenolic acid was canceled). The patient continued to take tacrolimus and glucocorticosteroids on an ongoing basis. During 2020, the patient proceeded her follow-up at the Outpatient Transplant Center; the functional parameters of transplanted organs remained stable throughout the year, the creatinine level being 125.3±10.1 μmol/L, urea 9.5±2.7 mmol/L, glucose 4.9±0.7 mmol/L.

A year and a half after the simutaneous pancreas and kidney transplantation, the patients became pregnant. A Council of doctors, including transplant surgeons, obstetrician-gynecologists, nephrologists, and therapists, made the decision on continuation the pregnancy. The patient got registered for dispensary follow-up for pregnancy at the VDMC clinic. At a gestational age of 13–14 weeks, there was a single exacerbation of graft chronic pyelonephritis, and no further signs of an inflammatory process in the genitourinary system were noted. Due to the unstable tacrolimus concentration (3.8–6.7–1.2 ng/mL) due to pregnancy, the extended release tacrolimus 13.5 mg, once a day; methylprednisolone 4 mg once a day were administered. According to the ultrasound examination (USE) results and biochemical screening in the first trimester, the pregnancy developed according to the term. Laboratory examination of the patient was performed every 2 weeks, a blood test showed the progression of iron deficiency anemia (hemoglobin 92.2 ± 7.3 g/L), which required the administration of iron preparations and erythropoietins. No functional abnormalities of the

pancreas graft were seen, the parameters remained at the following levels: glucose 5.49±1.45 mmol/L, glycosylated hemoglobin 5.25±0.15%, C peptide 3.5±0.46 ng/mL, lipase 26.38±8.41 U/L, amylase 26.01±9.28 U/L.

Fetus dopplerometry at 22–23 weeks of gestation showed no impairments in uteroplacental blood flow. According to ultrasound data at 30 weeks of gestation, no abnormalities were detected (Fig. 2).

Fig. 2. Ultrasound examination, 3rd screening

The mean creatinine level during pregnancy was 150.86±25.76 μmol/L, urea was 9.18±1.21 mmol/L.

Due to the increased risk of developing preeclampsia at 31 weeks of gestation, the patient was admitted at the maternity hospital of the Dzerzhinsky Perinatal Center. At a period of 35 weeks of pregnancy, the patient underwent a planned abdominal delivery under conditions of combined spinal-epidural anesthesia. A girl was born with a body weight of 2350 g and a body length of 45 cm. The child's condition was assessed as satisfactory, the Apgar score was 7/7 points. The examination conducted in the perinatal center revealed no pathological abnormalities in the condition of the newborn.

The mother's recovery in the postoperative period was without complications, the test and examinations performed revealed no signs of graft dysfunction. The use of immunosuppressants required the suppression of lactation; the patient and the child were discharged home on the 12th day.

The patient continues regular follow-up visits to the Outpatient Transplant Center. From June 2021 to April 2022, a stable function of the pancreas graft was maintained with glucose being 5.2±0.42 mmol/L, glycosylated hemoglobin 5.3±0.17%, C peptide 3.7±1.72 ng/mL, lipase 37.26±11.68 U/L, amylase 43.94±10.04 U/L. The results of regular instrumental and laboratory studies revealed no pathology of transplanted organs. The patient also regularly visits an obstetrician-gynecologist, reporting no complaints.

During the first year of life, no abnormalities in the child's health status were seen.

Conclusion

The results of the presented Case Report indicate the possibility of restoring fertility, onset of pregnancy, pregnancy course, and safe delivery after kidney and pancreas transplantation. In our opinion, the most important factor for achieving such a result is the interdisciplinary interaction of transplant doctors and obstetrician-gynecologists who monitor the patient's condition on an outpatient basis.

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