

**CASE REPORT**

# Pregnancy and delivery in a patient with an ectopic kidney transplant and bilateral hearing loss

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The authors have declared that no competing interests exist

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**Summary**

**Introduction:** Pregnancy management and the choice of delivery method in kidney transplant patients are still a matter of debate. The goal is to achieve the balance between mother's underlying disease treatment and optimal conditions for fetal development and maturity.

**Case study:** The patient is a 36-year-old woman whose first pregnancy was complicated by kidney transplantation 11 years ago. During hospitalization, the values of all renal function parameters and cyclosporine concentration in the blood were regularly monitored, and nephrologists and urologists were regularly consulted. Having in mind the pelvic presentation of the fetus, ectopic localization of the transplanted kidney and comorbidities such as deafness, gestational diabetes and gestational hypertension, the delivery was completed by caesarean section with the presence of a urologist and a healthy male child was born.

**Conclusion:** By following the trends in current literature and applying team work, intensive supervision and adequate therapy for the mother and the fetus, it is possible to manage pregnancy in complicated transplanted patients and achieve outcomes equal to those of a physiological pregnancy.

**Keywords:** transplanted kidney, pregnancy, delivery mode

## INTRODUCTION

Owing to the progress of medicine, in recent years the number of pregnant women with chronic diseases has increased. A special challenge for perinatologists is balancing the well-being of the mother in treating her chronic disease while maintaining optimal conditions for fetal development and bringing the pregnancy as close to the due date as possible. The method of delivery is an additional dilemma in such pregnancies. It is necessary to involve all relevant specialists in the management of such pregnancy.

Nowadays, more and more patients get a chance for survival and good quality of life owing to organ transplantation, and some of these patients decide to get pregnant. One of the most frequently transplanted organs are kidneys. Pregnancy management and delivery method in kidney transplant patients are still a matter of debate among experts (1).

In this case study, we present a patient who achieved her first pregnancy 11 years after renal transplantation indicated for congenital renal anomaly requiring nephrectomy and subsequent hemodialysis and who delivered a baby by caesarean section in the 37th week of gestation (GW).

## CASE STUDY

The patient is a 36-year-old female who was admitted to the Clinic for Gynecology and Obstetrics of the University Clinical Center of Serbia (CGO UCCS) in the 33rd GW of a desired spontaneous pregnancy complicated by kidney transplantation performed 11 years ago.

Kidney transplantation was performed in 2001 after nephrectomy due to congenital kidney disease, after which the patient was included in the hemodialysis program for the next three years. The patient's mother was the donor.

In addition to the kidney transplant, the patient underwent spina bifida surgery during her childhood. After nephrectomy, the patient reported impaired hearing, which is why she has had hearing aid implanted in both ears.

The pregnancy was regularly controlled at the local level, and then at the CGO UCCS. Combined screening of the first trimester showed 1:184 probability chromosome 21 trisomy, and values of bHCG and PAPP<sub>A</sub> were 4.28 MoM and 1.88 MoM respectively. Bearing in mind the use of immunosuppressive therapy during the entire pregnancy, including the first trimester, the patient was presented to the Genetic counseling board of the CGO UCCS, after which she opted for further diagnostics in the form of cordocentesis because other types of genetic diagnostics were unavailable at the gestational age the patient presented to the CGO UCCS. Cordocentesis showed a normal male karyotype (46, XY).

At the time of admission and during hospitalization, the patient was with no complaints. The patient's height at admission was 150 cm with BMI 22.22 kg/m<sup>2</sup>.

During hospitalization, specialists in nephrology, surgery and urology were consulted on several occasions.

The values of kidney function parameters (urea, creatinine, eGFR, uric acid, albumins, proteins, ionogram, p/c ratio in the morning sample and 24h urine) as well as the level of cyclosporine in the blood were monitored, and the dose of the drug was increased as needed. On several occasions, the patient received transfusion with filtered erythrocytes. Bacteriological analyzes were performed regularly, with an emphasis on a urine culture to prevent the development of pyelonephritis. Abdominal ultrasound scan showed that the right kidney was located in iliac fossa and apart from that it was a normal finding.

Due to approximately two-fold increase in pancreatic amylase, a general surgeon was consulted on several occasions. After examining abdominal ultrasound scans, as well as clinical signs and symptoms, continued monitoring of the mother and the fetus was indicated, with no signs of acute pancreatitis.

During hospitalization, gestational hypertension developed, which was well controlled with methyldopa, as well as gestational diabetes, which was well controlled by means of antidiabetic diet. Due to the risk of preterm birth, fetal lung maturation was performed with dexamethasone according to the protocol.

Delivery method was chosen according to obstetric indications. Considering the pelvic presentation of the fetus, while taking into account previous surgeries and comorbidities, it was decided to end the pregnancy by caesarean section with the presence of a urologist.

A caesarean section was performed in the 37th GW with the presence of urology consultants and the patient gave birth to a live male child measuring 46cm/2270g/33cm, with Apgar score 8/9. Intraoperatively, it was established that the transplanted kidney was ectopic, placed in the right iliac fossa, polycystically altered and with a dilated ureter. The procedure went smoothly, there was no lesion of the urinary tract and hemostasis was correct.

## DISCUSSION

In addition to challenges in managing pregnancy after kidney transplantation, the localization of the transplanted kidney in the iliac fossa represents an additional predisposition to the development of typical complications such as hydronephrosis and pyelonephritis due to the pressure of pregnant uterus. Moreover, this localization represented an additional intraoperative risk, and during the caesarean section, urologists were called in for consultation, a practice that is known and recommended in other centers (2). This kind of cooperation, as well as

regular consultations of nephrologists make good team work which is essential for optimal pregnancy management and well-directed delivery.

Multiple consultations with nephrologists enabled precise monitoring of allograft function with the aim of preventing its rejection. Generally, patients who had good creatinine clearance before pregnancy should not have an increase in serum creatinine during pregnancy, and a subtle increase in creatinine levels may be overlooked as an early sign of allograft rejection. However, most studies (1, 3, 4) show that pregnancy is not a predisposing factor for graft rejection, and if there is any suspicion, kidney biopsy is recommended to detect the cause of allograft dysfunction (5).

According to recent research by Kattah and the authors (6), hyperfiltration that exists in physiological pregnancy can lead to glomerular hyperfiltration injury, which in some cases progresses to glomerulosclerosis worsening the quality of life postpartum. Hydration and regular monitoring of eGFR values in order to prevent hyperfiltration injury was therefore another task of the nephrology team.

In a recent paper by Shwartz et al. (7) eGFR before pregnancy correlated with GW at delivery and with the percentage of eGFR decline during pregnancy. The age of transplantation (time after transplantation + age of the donor at the time of donation) was not correlated with the percentage of graft loss during pregnancy, which was also confirmed in our patient whose transplantation was performed 11 years before pregnancy. An eGFR of less than 40 mL/min/1.73 m<sup>2</sup> before pregnancy was not only associated with a high risk of loss of graft function, but also with a high risk of fetal or perinatal death of the offspring. According to this study, an eGFR of 40 mL/min/1.73m<sup>2</sup> marks the lower limit of a reasonably planned pregnancy.

The most common maternal complications in pregnant women with kidney transplants are the development of gestational hypertension, preeclampsia or gestational

diabetes due to a chronic use of corticosteroids (8). Our patient developed gestational hypertension in the last trimester, which was successfully controlled with methyldopa and did not require a preventive use of aspirin in order to prevent the development of preeclampsia (9). The same applies to gestational diabetes mellitus, which was well controlled by a diet without elements of fetal macrosomia, although data in the literature show that 10% of patients on calcineurin inhibitor therapy require insulin therapy during pregnancy (8,10).

A question that is raised in this case could be the examination of hereditary factors or *in utero* exposure of the patient, given her characteristic comorbidities such as spina bifida and extremely short stature.

## CONCLUSION

This is a case of a female patient who was admitted to a tertiary level health care institution for pregnancy management after a kidney transplant 11 years before with comorbidities such as bilateral hearing loss and extremely short stature, and whose pregnancy was complicated by breech presentation of the fetus. With successful teamwork and cooperation between perinatologists, nephrologists and urologists, the patient had a successful delivery by means of caesarean section, giving birth to a healthy child with an Apgar score of 8/9 at full-term. By following current literature and applying team work, intensive supervision and adequate therapy for the mother and the fetus, it is possible to manage pregnancy in complicated transplant patients and achieve outcomes equal to those in a physiological pregnancy.

## Conflict of interest:

None to declare.

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## TRUDNOĆA I POROĐAJ KOD PACIJENTKINJE SA EKTOPIČNIM TRANSPLANTIRANIM BUBREGOM I BILATERALNOM NAGLUVOŠĆU

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### Sažetak

**Uvod:** Održavanje trudnoće i izbor načina porođaja kod pacijentkinja sa transplantiranim bubregom su i dalje predmet debate gde je cilj postići balans između lečenja osnovne bolesti majke i postizanja optimalnih uslova za razvoj i dosezanje zrelosti ploda.

**Studija slučaja:** Radi se o pacijentkinji uzrasta 36 godina čija je prva trudnoća komplikovana stanjem nakon transplantacije bubrega pre 11 godina. Tokom hospitalizacije redovno su praćene vrednosti svih parametara bubrežne funkcije i koncentracije ciklosporina u krvi, i redovno obavljane konsultacije nefrologa i urologa.

**Cljučne reči:** transplantirani bubreg, trudnoća, porođaj

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Imajući u vidu karličnu prezentaciju ploda, ektopičnu lokalizaciju transplantiranog bubrega i komorbiditete u vidu nagluvosti, gestacionog dijabetesa i gestacione hipertenzije, porođaj je završen carskim rezom uz prisustvo urologa i rođeno je zdravo muško dete.

**Zaključak:** Uz aktuelno praćenje literature, timski rad i intezivan nadzor i adekvatnu terapiju kod majke i ploda, moguće je kod komplikovanih transplantiranih pacijentkinja trudnoću voditi i svesti na nivo ishoda kao kod fiziološke trudnoće.