

Bipolar Cord Coagulation in a Monochorionic Twin Pregnancy Discordant for Anencephaly

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Abstract

We present ultrasound guided bipolar coagulation of the umbilical cord in a case of monochorionic twin discordant for anencephaly with polyhydramnios at 26 weeks of gestation. For ligation of the umbilical cord, we used 3.5 mm laparoscopic trocar and 3.0 mm bipolar forcep. The procedure was completed in 30 minutes without maternal and fetal complications. Postoperative course of the patient and the surviving twin was uneventful. At 35 weeks of gestation, nine weeks after the procedure, the patient was admitted in labor. The patient delivered vaginally a live female baby and anencephalic female fetus weighing 2200 g and 530 g, respectively. Placental examination revealed monochorionic diamniotic placentation weighing 450 g. Postpartum period was uneventful and the mother and the infant were discharged at 48h. The infant is now 1-year-old and grows up healthy.

Keywords: monochorionic twin, anencephaly, fetal reduction, electrocoagulation, umbilical cord

Özet

Monokoryonik İkiz Eşi Anensefali Fetusu Bipolar Kord Koagülasyonu

Bu çalışmada, 26. gebelik haftasında ağır polihidramnios nedeniyle refere edilen monokoryonik ikiz gebelikte, ikiz eşinde anensefali tespit edilmiş ve bu fetusa bipolar kord koagülasyonu işlemi yapılan bir olgu sunuldu. Kord koagülasyonu için 3.5 mm laparoskopik traktor ve 3.0 mm bipolar forseps kullanıldı. İşlem 30 dakika sürdü ve maternal ve fetal komplikasyon gelişmedi. İşlem sonrası gebe izleme alındı, 35. gebelik haftasında 2200 g sağlıklı bir kız çocuğu ve 530 g dişi anensefali fetus vajinal doğurtuldu. Postpartum muayenede 450 g ağırlığındaki plasentanın monokoryonik diamniotik olduğu teyit edildi. Anne ve bebek 2 gün izlem sonrası sağlıklı taburcu edildi. Kız çocuğu, şu anda 1 yaşında olup sağlıklı büyümeye ve gelişmeye devam etmektedir.

Anahtar sözcükler: monokoryonik ikiz, anensefali, selektif fetosid, bipolar koagülasyon, kord ligasyonu

Introduction

Selective fetocide may be considered in a monochorionic twin pregnancy when one fetus is affected by a condition not compatible with postnatal life and compromising the nonaffected fetus, especially in twin-to-twin transfusion syndrome, twin reversed arterial perfusion, and discordance for fetal abnormality (1,2). Monochorionic twin pregnancy discordant for anencephaly places the normal twin at risk for fetal death and may lead to polyhydramnios and its related complications (3).

The conventional technique of intracardiac injection of potassium chloride is not an option in monochorionic twins because

the vast majorities have vascular anastomoses (4). More appropriate techniques aim at arresting the umbilical cord flow completely and permanently (5,6). Neodymium/yttrium-aluminum-garnet (Nd:YAG) laser (6,7), fetoscopic ligation (8), monopolar thermocoagulation (5) and bipolar cord ligation (1,2) are invasive procedures and have been suggested for selective fetocide in monochorionic twin, particularly in twin-to-twin transfusion syndrome and acardiac twin pregnancy. But bipolar cord ligation in monochorionic twin discordant for anencephaly was reported in few cases in the literature (2,8). We present ultrasound guided bipolar coagulation of the umbilical cord in a case of monochorion twin discordant for anencephaly.

Case Report

A 31-year-old multigravid was referred to our maternal and fetal unit due to suspicion of fetal anomaly in a monochorionic

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twin pregnancy. At referral detailed ultrasonographic scanning revealed monochorionic diamniotic twin pregnancy discordant for acrania and structurally normal co twin with a fetal biometry of 14 weeks of gestation (Figure 1a). The parents were counseled about the potential risks and for complications of monochorionic twin pregnancy discordant for acrania-anencephaly as preterm delivery and spontaneous intrauterine death, and intervention to occlude umbilical cord of the fetus with acrania was considered. But the parents refused the intervention. Subsequently the fetus with acrania became anencephalic (Figure 1b) and gradually developed severe polyhydramnios with 35 cm amniotic fluid index at 26 weeks of gestation. The parent was informed for bipolar cord coagulation or serial amnion-drainage as treatment options, including their inherent risks.



Figure 1. (a) Ultrasonographic image demonstrating two fetuses in the single chorionic cavity (monochorionic) at 8 weeks (arrows). (b) The fetus with anencephaly at 16 weeks (arrow). (c) Bipolar forceps passed through the trocar and grasped the umbilical cord (arrow). (d) Steam bubbles of bipolar coagulation (arrow).

After approval of the hospital ethic and perinatal-neonatal committees, and written informed consent of the parents, it was decided to occlude the umbilical cord with bipolar coagulation. For ligation of the umbilical cord, we used 3.5 mm laparoscopic trocar and 3.0 mm bipolar forceps (Karl Storz, Tuttlingen, Germany). The procedure was done in the operating room after achievement of complete aseptic conditions and 50 mg meperidine im for sedation and local anesthesia by injection of 1% lidocaine deep into myometrium. The port insertion site was chosen according to the position of the fetus and location of the placenta, and the target umbilical cord. The trocar was inserted into amniotic cavity under ultrasonographic guidance (Figure 1c). Bipolar forceps was passed through the trocar and the portion of the umbilical cord close to the placental insertion site as possible was grasped (Figure 1d). Bipolar coagulation started at power setting of 20 W, and was applied during 30 seconds and was increased by increments of 5 W up to maximum 50 W until arrest of flow was demonstrated by color Doppler ultrasonography.



Figure 2. (a) Bipolar coagulation site of the umbilical cord (arrows). (b) Surviving cotwin. (c) The anencephalic fetus. (d) The portion of monochorionic placenta perfused by the anencephalic fetus.

After no visible flow, one juxtaposed cord segment was coagulated in a similar fashion (Figure 2a). Drainage of 1500 ml amniotic fluid was also done for relief of uterine distention. The procedure was completed in 30 minutes without maternal and fetal complications. Routine prophylactic measures included indomethacin tocolysis for 48 hours and 3 g ceftazolin for 24 hours. Two doses of betamethasone 12 mg intramuscularly 24 hours apart were also given due to possibility of preterm labor.

The patient was kept in the hospital for 48 hours. Postoperative course of the patient and the surviving twin was uneventful. At 35 weeks of gestation, nine weeks after the procedure, the patient was admitted in labor. The patient delivered vaginally a live female baby and anencephalic female fetus weighing 2200 g (Figure 2b) and 530 g (Figure 2c), respectively. Placental examination revealed monochorionic diamniotic placentation weighing 450 g (Figure 2d). After two days of hospitalization, the mother and the baby were discharged. The infant is now 1-year-old and grows up healthy.

Discussion

Selective termination of the fetus having anomaly such as anencephaly not compatible with life and compromising the nonaffected fetus is a treatment option in monochorionic twin pregnancies. Monochorionic twin pregnancy discordant for anencephaly places the normal twin at risk for fetal death and may lead to polyhydramnios and its related complications. It was reported that the expectant management is associated with spontaneous intrauterine death of the anencephalic fetus in about 25% of cases and places the normal co-twin at risk in monochorionic twins due to vascular anastomoses (3). Amniotransfusion does not cure underlying pathophysiology, and reaccumulation of the amniotic fluid necessitates serial drainage which is not far from the complications. Arresting the umbilical cord flow completely and permanently is more appropriate and definitive technique (1,2,5,9).

Several techniques were reported for occluding the umbilical cord flow, such as Nd:YAG laser (6,7) fetoscopic ligation (8), monopolar thermocoagulation (5), bipolar cord ligation (1,2) and alcohol ablation (10), and have been suggested for selective feticide in monochorionic twin, particularly in twin-to-twin transfusion syndrome and acardiac twin pregnancy. Bipolar cord ligation and Nd:YAG laser are favored techniques in clinical practice. Fetoscopic laser has a high failure rate above 20 weeks of gestation (6,7). Fetoscopic cord ligation is relatively complex, and the procedure needs the higher number of ports and fails in about 10% of cases (6,8).

Ultrasound guided bipolar cord coagulation is a simpler and effective technique for cord ligation. The procedure can be done through one port and relies on existing instrumentation. Bipolar coagulation simultaneously obliterates both the umbilical arteries and the vein, causing immediate cessation of flow. This technique has been mostly experienced in twin-to-twin transfusion syndrome and twin reversed arterial perfusion, with survival rates of about 70-80% and preterm ruptures of the membranes as 20-30% (1,2). But bipolar cord ligation in monochorionic twin discordant for fetal anomaly was reported in limited number of cases (2,8). In this report we present successful ultrasound guided bipolar coagulation of the umbilical cord in a case of monochorion twin discordant for anencephaly. In conclusion cord ligation with ultrasound guided bipolar coagulation seems to be currently the best

available option for selective feticide in monochorionic twin pregnancies in which the anencephalic fetus is compromising the nonaffected fetus.

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