CASE REPORT

Trap Sequence and its Consequences

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Summary

TRAP sequence is a rare, serious malformation with reported incidence 0.3 in 10.000 pregnancies. The prognosis is lethal for the recipient, whereas perinatal mortality and malformation risks are up to 50 % and 10% in pumping twin.

We present three cases of TRAP sequence diagnosed and followed at our institution from August to October 2011.

Outcome of TRAP sequence depends on the time of diagnoses, treatment modality and timely delivery.

Key words: *Acardiac twin*, TRAP sequence, fetoscopic Radiofrequent ablation

AIM OF THE DEMONSTRATION

Acardiac twinning or TRAP (Twin reversed arterial perfusion) sequence is a rare, but serious malformation with reported incidence 0.3 in 10.000 pregnancies (8). This complication occurs in 1% of monozygotic twins (1). Pathophysiology includes abnormal vascular anastomoses in the placenta with reversal flow in the acardiac twin (7). The antenatal diagnosis of TRAP sequence can be established during the first-trimester screening (5,12).

We present three cases of TRAP sequence diagnosed and followed at our institution from August to October 2011. In two cases fetoscopic Radiofrequent ablation (RAF) was performed in Luvén University Hospital, Belgium.

CASE REPORT 1

A 40-year-old lady, (G7P0, intracytoplasmic sperm injection /embryo transfere) was referred for the second opinion scan at 23+4 weeks of gestational. Ultrasound revealed monochorionic, diamniotic twin pregnancy with one normally appearing retarded fetus with abnormal venous Doppler. A single large placental mass was located in the fundal region. The second fetus had an incompletely formed skeleton, partly formed head and an abdominal stump without any intraabdominal organs 95x54x45mm in size; there were one well-developed lower limb which showed massive, diffuse, soft tissue edema (Fig.1). The umbilical cord of the abnormal fetus had a single umbilical artery. This appearance was typical for TRAP sequence with an acardiac twin. Uncomplicated radiofrequent ablation (RAF) was performed in Luvén University Hospital (Fig.2). After invasive procedure this patient was followed-up with serial ultrasound examinations. Cesarean section was performed at 31+3weeks due to premature rupture of membrane. Severely retarded girl (716g) was born with Apgar scores 4/6/7 in 1/5/10 minutes. The newborn experienced necrotizing colitis, laparotomy due to volvulus and congenital narrowing of jejunum, septic shock, and intraventricular hemorrhage. At her 6 corrected months of life her weight was 4500g, 55 cm length with severely increased tone in extremities.

CASE REPORT 2

A 28-year-old lady (G2P2) was referred for a second opinion anomaly scan. TRAP sequence was confirmed at 16+6 weeks of gestation. The anomalous fetus was an amorphous heterogeneous mass; it had an abdominal stump 80x40 mm with an echogenic structure that resembled the spine. It had both small lower and upper limbs; their autonomous movements were registered. Surviving fetus was consistent with 15+6 weeks of gestation, growth restricted, but with normal Doppler. After RAF procedure ex-pumping twin grew appropriately; 4 weeks after invasion resumed vascularisation in acardiac twin. Antenatal death of surviving fetus was confirmed at admission at 38+6 weeks. Birth weight of macerated neonate was 2760g. Partly mumified acardiac fetus was born together with placenta [Fig.3].

CASE REPORT 3

In a 31-year-old lady (G5P2) TRAP sequence was confirmed at 16+5weeks. In surviving fetus multiple anomalies-ventriculomegaly, ventricular septal defect, hypoplastic kidneys were revealed in the presence of karyotype 46XX. The labour was induced due to antenatal death of pumping fetus at 26 weeks of gestation.

DISCUSSION

The first time acardiac malformation was described by *Benedetti* in 1553. The artery-to-artery anastomosis in fused placenta between twins lead to the retrograde perfusion of deoxygenated blood from pump foetus to „recipient“ twin, resulting in variety structural abnormalities in the latest (10). Acardiac twin never survive, and the perinatal mortality of the pump twin is reported to be around 50% (4). The poor outcome of the pump twin is primarily due to congestive heart failure, prematurity or major malformations (9). The early recognition of this abnormality in the antenatal period becomes important for the proper management. Management options include elective termination, observation, selective nonsurgical and surgical interventions. Different surgical techniques have been

applied (2, 6). Elective reduction of the acardiac twin with RFA was found to be minimally invasive and effective. That therapeutic intervention before the onset of intrauterine fetal complications became available recently either for Latvian citizens in Luven University Hospital (European project N E112). Studies place the safest time for delivery of twin pregnancies at 36 to 38 weeks (3). That makes us think that case 2 would have another, more favorable outcome if induced earlier. Therefore outcome of pregnancy with TRAP sequence depends on the time of diagnoses, treatment modality and timely delivery.

Conflict of interest: None

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Fig.1. Case 1: Transabdominal USG shows the abdominal stump of the abnormal fetus demonstrating heterogeneous echotexture, without any discernable internal organs with diffuse massive soft tissue edema

Fig.2 Radiofrequency ablation technique. Procedure performed by single puncture with a 17-gauge needle 1 mm diameter in size, using real-time ultrasound guidance. In utero time is 15min, intra fetal time of RFA is 10 minutes. Tips temperature is 20°C. Adapted from http://fetus.ucsfmedicalcenter.org/twin/learn_more_trap.asp

Fig.3 Case 2: Partly mumified acardiac fetus, which was born together with placenta. We can see both lower and upper extremities, that continued to grow after resuming of vascularization