Selective intrauterine growth retardation in monochorionic twins accompanied by vasa previa

Mariola Krzyścin, Mariola Ropacka-Lesiak, Grzegorz H. Bęborowicz

Abstract
Velamentous cord insertion and vasa previa can impair the fetal growth. This pathology occurs either in singleton or more often in monochorionic (MC) twin pregnancies where it can accompany the selective intrauterine growth retardation (sIUGR). This condition is related to increased fetal mortality and morbidity especially due to a very high risk of vessel rupture. Transvaginal ultrasound screening with colour flow Doppler enables antenatal diagnoses of vasa previa and improves neonatal outcome. In this paper a case of antenatally detected sIUGR with vasa previa in a MC twin pregnancy is described. Due to a reasonable twin pregnancy advancement in the case complicated by sIUGR there was made a decision about delivery. Both infants were born in 34 week by elective caesarean section in a good condition.

Key words: intrauterine growth retardation, monochorionic twins, vasa previa

Introduction
SIUGR is a twin pregnancy complication defined as an impairment of one fetus growth of more than 10 percentile as suspected according to gestational age. The fetal growth discrepancy often exceeds 25%. The same term concerns both mono- and dichorionic (DC) twin pregnancies but in fact they are completely different pathologies. There is only one placenta in MC and two placentas in DC twin pregnancies. sIUGR in MC occurs because of placental territory discordance. Normally, there are many vascular connections within monochorionic placenta called anastomoses, which level the amount of blood in two compartments. Three different types of anastomoses: veno-venosus, arterio-venosus and arterio-aretrial may be distinguished. The main problem in sIUGR is a placental territory discordance, unequal placental sharing and insufficient compensation of blood flow through anastomoses in two parts of placenta that may result in abnormal blood flow in the umbilical artery (UA). Basing on the umbilical artery diastolic blood flow in growth restricted fetus, three types of abnormal blood flow may be described (type I: present; II: constantly absent/reverse (AEDF/ REDF); III: intermittently absent or reverse end-diastolic blood flow) [1, 2]. MC placentas demonstrate an increased rate of velamentous cord insertion with an incidence of 12% and vasa previa with the incidence of around 2,5% which is much higher compared pregnancies [3]. It is believed that these findings are more common in MC twins with type II sIUGR [4]. Still, it has to be underlined that the sIUGR in MC pregnancies is a pathology with regards to both twins.

The etiology of IUGR in DC twins resembles the problem in single pregnancy and concerns only the space of one amniotic sac. There are many different causes of this but the disease always pertains one fetus and not his brother [1].

In this paper a case report of sIUGR with the presence of vasa previa in MC pregnancy is described.

Case report
A thirty year old multipara was admitted into the Department of Perinatology and Gynecology at 11 week of gestation with the initial diagnosis of MC twin pregnancy. In general the patient was a healthy woman with one previous cesarean section in anamnesis because of fetal macrosomia. The current pregnancy was following spontaneous conception. Monochorionicity we confirmed. Additionally, an enlarged nuchal translucency of 2.4 mm was found in one twin (an upper limit of the reference ranges). The blood flow in the DV and thorough the TV valve was normal in both twins. The patient was informed about the risk of chromosomal abnormalities and refused any invasive testing. In the 20. week of gestation the first symptoms of asymmetric fetal growth with the discrepancy of 15% were noticed. The smaller twin also presents signs of an enlarged lateral ventricles up to 10 mm. The transvaginal ultrasound and colour Doppler velocimetry revealed a membranous umbilical cord insertion and vasa previa were found. Within 26
weeks of gestation an AEDF in the umbilical cord in the growth restricted fetus was observed. Periodically the reversed end-diastolic flow was noticed. The blood flow during atrial contraction in the DV was positive. The patient was monitored by Doppler and ctg. Expectant management had been carried on until the absent A wave in DV appeared in 33. gestational week. Simultaneously, betamethason therapy was introduced. Because of a rational twin pregnancy advancement was achieved an elective caesarean section was performed and both twins were born in good conditions (the first one with a birth weight of 1880 g and the second one of 1550 g).

Discussion

The perinatal mortality and morbidity in MC is significantly higher than in DC twin pregnancies. The blood transfusion between fetuses through anastomoses depends on the type of anastomoses and may cause several complications including chronic and acute peripartum twin to twin transfusion syndrome (TTTS), twin anemia-polycythemia sequence (TAPS) and sIUGR [5].

MC placentas demonstrate an increased rate of velamentous cord insertion with an incidence of 12%, compared to 7% in DC placentas and 2% in singletons [3]. If the placenta is located in lower part of the uterus the velamentous cord insertion constitutes a direct risk for vasa previa. Vasa previa has traditionally been associated with potential risk of acute obstetric complications due to rupture, causing acute fetal hemorrhage [6, 7]. The prevalence of vasa previa in twin pregnancies is considerably high at 2.5% compared to singleton at around 0.04%, respectively [6, 8].

The principle cause for the development of sIUGR in MC twins is not an unequal placental sharing. Discordant fetal growth raises with increased placental territory discrepancy [9, 10]. Extremely asymmetric distribution of placental territories is often associated with very eccentric or velamentous cord insertion [11]. It is unclear, whether velamentous insertion is a sole consequence of the asymmetric placement of the vascular equator or whether it has any implications in the pathophysiology of growth restriction. Abnormal cord insertion may impede blood flow and attenuate the severity of growth restriction. Aside from placental territory discordance, a second factor largely influencing fetal growth discordance and the natural history of sIUGR in MC twins is the presence of vascular anastomoses in the MC placenta [12, 13]. Larger placental territory discordance is usually associated with more blood flow interchange that interferes in the natural history of the smaller twin.

In some circumstances anastomoses may work protectively for the smaller twin, in other they may carry additional risks to both fetuses [12].

In type II sIUGR there is a large placental discordance but poor distribution of placental inter-twin anastomoses – quite similar to uncomplicated MC twins [12]. Placental territory of the IUGR twin is usually extremely small and reflects the fetal size. Type II pattern of sIUGR is defined and characterized by persistent AEDF/REDF in the UA [1].

The visualisation of placental cords insertions by colour Doppler is an obligatory part of ultrasound examination, especially in MC twins. The sensitivity of colour Doppler ultrasound to detect velamentous cord insertion in singletons between 18 and 20 weeks is almost 100% [14]. In twins, cords insertions should be visualised up to 16. week of gestation. Usually, vasa previa may be diagnosed by transvaginal scan and colour-pulsed wave Doppler. Its accuracy for detecting vasa previa is not well known [14]. Vasa previa running across the internal os may rupture and consequently lead to severe fetal exsanguinations with mortality rate of 33% up to 100%. In presence of vasa previa rupture of amniotic membranes in a MC twin pregnancy may have catastrophic consequences for both twin as well as it may can lead to double fetal exsanguinations. Because both twins are interconnected through placental anastomoses, the rapid exsanguination and hypovolemic circulation in one twin may force the blood flow from his brother and thus lead to acute feto-fetal blood transfusion [15]. To avoid a rupture of the vasa previa during delivery an elective cesarean section after steroid administration is recommended. Unfortunately, the diagnosis of vasa previa is difficult and often vasa previa are missed antenatally. However, the suspicion of vasa previa should be made in any case of MC twins with velamentous umbilical cord insertion, especially when located close to the internal cervical os.

References


Mariola Krzyścin
Department of Perinatology and Gynecology
Poznan University of Medical Sciences
60-535 Poznań, Polna 33, Poland
e-mail: gBrebor@wp.pl