

# Velamentous cord insertion and birth weight discordance in monochorionic twin pregnancy: a case report

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## Abstract

**Objective:** The aim is to discuss the impact of non-central placental cord insertion on birth weight discordance in twin pregnancies.

**Case:** Thirty-year-old patient with gravida 2 and parity 1 referred to our clinic when she was found to be monochorionic diamniotic twin pregnant. Upon the determination of crown-rump length (CRL) discordance between both fetuses in the first trimester screening test carried out at twelve weeks of gestation, the patient was taken under close follow-up. Marginal insertion was found in the cord of one of the fetuses in the ultrasonographic examination performed due to the slight increase of discordance between the fetuses at 16 weeks of gestation. The case showing intrauterine growth retardation (IUGR) as of the 24 weeks of gestation was monitored closely via biophysical scoring and Doppler parameters. The patient was delivered by cesarean section due to the decrease in biophysical score and the determination of reverse flow in umbilical artery of the fetus found to have marginal cord insertion and IUGR at 30 weeks and 4 days of gestation.

**Conclusion:** Non-central placental cord insertion contributes to the birth weight discordance in monochorionic twin pregnancies. Sonographic determination of the location of placental cord insertion can be assessed as the criteria in antenatal evaluation of twin pregnancies. Also, we believe that a careful determination of umbilical cord insertions is useful together with close follow-up of the fetuses when twin discordance is found in first trimester monochorionic pregnancies.

**Keywords:** Twin discordance, monochorionic pregnancies, velamentous cord insertion.

## Özet: Monokoryonik ikiz gebelikte velamentöz kord insersiyonu ve doğum ağırlığı diskordansı: Olgu sunumu

**Amaç:** İkiz gebeliklerde, santral olmayan plasental kordon insersiyonunun doğum ağırlığı diskordansına olan etkisinin tartışılması amaçlanmıştır.

**Olgu:** Otuz yaşında, gravida 2, parite 1 olan hasta monokoryonik diamniyotik ikiz gebelik saptanması üzerine kliniğimize başvurdu. On ikinci haftada yapılan ilk trimester tarama sırasında her iki fetüs arasında baş-popo mesafesi (CRL) diskordansı saptanması üzerine hasta yakın takibe alındı. On altıncı gebelik haftasında fetüsler arasındaki diskordansın az miktarda artarak devam etmesi üzerine yapılan ultrasonografik incelemede fetüslerden birinin kordunda marjinal insersiyon saptandı. Yirmi dördüncü haftadan itibaren intrauterin gelişme geriliği (IUGR) bulguları gösteren olgu biyofizik skorlama ve Doppler parametreleri ile takibe alındı. Otuz hafta dört günlük gebelik mevcutken marjinal kord insersiyonu olan ve IUGR saptanan fetüste umbilikal arterde ters akım saptanması ve Biyofizik skorda bozulma nedeniyle hasta sezaryen ile doğurtuldu.

**Sonuç:** Santral olmayan plasental kord insersiyonu monokoryonik ikiz gebeliklerde doğum ağırlığı diskordansına katkıda bulunur. Plasental kord insersiyon yerinin sonografik tayini ikiz gebeliklerde antenatal değerlendirmede bir kriter olarak değerlendirilebilir. Ayrıca ilk trimester monokoryonik gebeliklerde ikiz diskordansı tespit edildiğinde fetüslerin yakın izleminin yanında umbilikal kord insersiyonlarının dikkatli bir şekilde tayininin faydalı olacağı görüşündeyiz.

**Anahtar sözcükler:** İkiz diskordansı, monokoryonik gebelikler, velamentöz kord insersiyonu.

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## Introduction

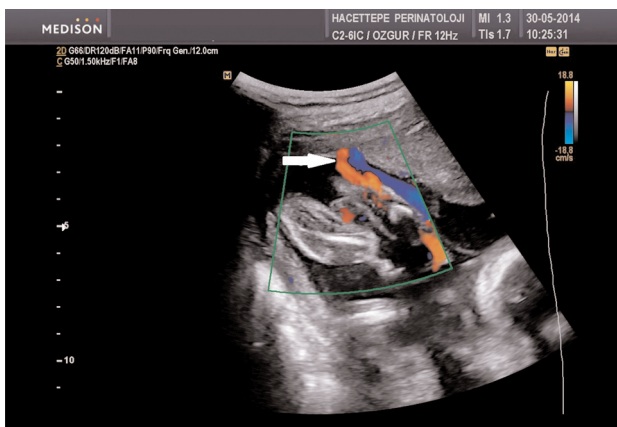
Increased morbidity and mortality are seen in all perinatal complications of twin pregnancies except post-term pregnancy and macrosomia.<sup>[1]</sup> As in other complications, compared to the dichorionic twin pregnancies, intertwin weight discordance in monochorionic twin pregnancies is observed more frequently.<sup>[2]</sup> The studies carried out until today have shown that intertwin birth weight discordance is associated with increased morbidity and mortality.<sup>[3]</sup>

The location of placental umbilical cord insertion is a factor contributing perinatal morbidity in singleton and twin pregnancies. Marginal cord insertion observed in 7% of singleton pregnancies is more frequent in twin pregnancies. In monochorionic twin pregnancies, this rate is distinctly higher. In this case report, we aimed to present the monochorionic twin pregnancy case with marginal cord insertion in one of the fetuses resulting with intrauterine growth retardation and to discuss its management.

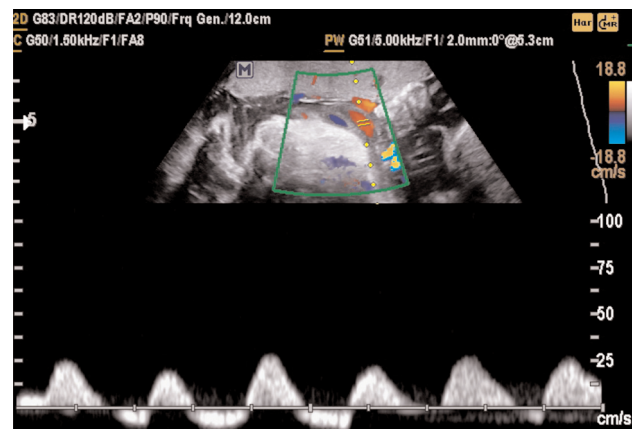
## Case Report

Thirty-year-old patient with gravida 2 and parity 1 referred to our clinic when she was found to be monochorionic diamniotic twin pregnant in another clinic. In the first examination, monochorionic diamniotic twin pregnancy was determined. The pregnancy was measured as 12 weeks and 6 days according to the last menstrual period, and crown-rump length (CRL) was 54.3 mm (12 weeks) and nuchal translucency (NT) was 1.1

mm in the right fetus while CRL was 69.7 mm (13 weeks and 1 day) and NT was 1.2 mm in the left fetus. This one week difference in the measurements of fetuses was thought to be associated with early-onset twin-to-twin transfusion syndrome (TTTS) which is reported in the literature and can be seen in monochorionic pregnancies, and the patient was taken under close follow-up. In the next follow-ups of the patient, the discordance between fetuses as of 14 weeks of gestation became more distinctive. The patient was applied amniocentesis at 16 weeks of gestation. While no fetal anomaly was determined in the ultrasonographic examination, it was found that the cord of right fetus was entering into the placenta marginally, and this condition was considered as the reason of IUGR in this fetus (**Fig. 1**). Upon the normal result of karyotype analysis, the patient was taken under ultrasonographic follow-up with two weeks of intervals. Beginning from 24 weeks of gestation, the patient was followed up with color Doppler. At 28 weeks of gestation, end-diastolic flow loss occurred in the umbilical artery of right fetus. At this stage, two doses of corticosteroid (betamethazone 12 mg with 24h interval) were administered to the patient to increase fetal lung maturation and weekly follow-ups were maintained. In the ultrasonography carried out at 30 weeks of gestation, the measurements of the fetus with central-located cord insertion were found consistent with 29 weeks of gestation, and estimated fetal weight was 1341g. The measurements of the fetus with marginal insertion were consistent with 26 weeks of gestation and estimated fetal weight was measured as 834 g. In the Doppler examina-



**Fig. 1.** Marginal cord insertion into the placenta on the right fetus (arrow).



**Fig. 2.** Reverse flow in umbilical artery shown in ultrasonographic examination.

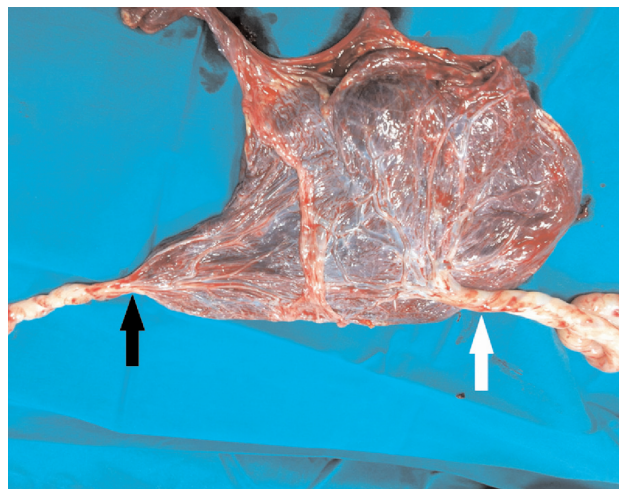
tion, the delivery was decided due to the observation of poor biophysical score and reverse flow in umbilical artery of this fetus (**Fig. 2**). Babies which were 1140 g and 736 g were delivered by cesarean section with 1-minute and 5-minute Apgar scores as 3; then, they were intubated and taken into newborn intense care unit. Marginal insertion was observed in the cord of the smaller fetus (**Fig. 3**). The babies were discharged after newborn intense care follow-up without any complication.

## Discussion

Twin pregnancies are associated with increasing perinatal morbidity rates.<sup>[1]</sup> While growth discordance causes poor outcomes, these cases are the patients that should be considered as the high-risk group.<sup>[4]</sup> In twin pregnancies, there are many reasons causing discordance and varying according to chorionicity.

The studies show that unequal placental share and umbilical cord insertion anomalies in monochorionic twin pregnancies cause growth discordance. This rate is lower in dichorionic twins compared to monochorionic twins.<sup>[5]</sup> It was found in the study carried out on the placentas of 60 monochorionic twin pregnancies that either the existence of velamentous or marginal insertion significantly increases weight discordance.<sup>[6]</sup> There are studies in the literature investigating the accuracy of determining cord insertion sonographically in singleton and twin pregnancies. In a study carried out by Di Salvo et al. on singleton and twin pregnancies, it was proved that cord insertion was determined accurately in the ultrasonography examination by histopathological studies performed on 49 out of 54 pregnancies later.<sup>[7]</sup>

In twin pregnancies, CRL discordance is a non-rare condition which can be observed depending on the different genetic potential or unequal placental share. Besides, there are studies in the literature showing that CRL discordance at early weeks is associated with pregnancy loss, chromosomal anomalies or structural malformations.<sup>[8,9]</sup> In the systematic review of D'Antonio et al., it was reported that the increase of CRL discordance at 11–14 weeks of gestation is associated with intrauterine loss risk. Accordingly, when CRL discordance exceeds 50%, intrauterine mortality of one of the fetuses reaches to 100%.<sup>[8]</sup> Also, there is an increase in preterm labor and the risk of IUGR. In addition, increases in diaphragmatic hernia, ventricu-



**Fig. 3.** Marginal insertion of cord on the right side of placenta specimen after birth (black arrow), and central-located insertion of cord on the left side (white arrow).

lomegaly, schizencephaly, aortic atresia and sacral agenesis were reported in fetuses with CRL discordance at first trimester.<sup>[10]</sup>

While it was expressed that predictive value of CRL discordance is weak for poor perinatal outcome, it was reported that the rate of perinatal loss doubles when monochorionicity is determined. There are studies showing that CRL discordance at an early period such as first trimester can be a predictor to determine weight discordance.<sup>[9]</sup> As a result of these studies, when chromosomal and structural anomalies are ruled out, it has been shown that CRL discordance has a weak relationship with poor perinatal results. Also, it has been highlighted that this association is not useful to estimate poor outcomes that may develop after 14 weeks of gestation in monochorionic and dichorionic pregnancies.<sup>[9]</sup>

Antenatal observation is significant in twin pregnancies in terms of increased risks. In this report, fetal weight evaluation has a 20% margin of error. The factors that may cause weight discordance including the location of placental cord insertion should be investigated in these cases.

## Conclusion

Marginal cord insertion is a condition that may cause first trimester CRL discordance, estimated fetal weight discordance and intrauterine growth retardation in

monochorionic twin pregnancies. Insertion location of the cord in twin pregnancies can be a parameter to determine during antenatal period in terms of gestational follow-up.

**Conflicts of Interest:** No conflicts declared.

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