

Persistent Funic Presentation And Sonographic Assessment Of The Risk For Umbilical Cord Prolapse



Introduction

Funic presentation (also known as cord presentation) is a rare entity with an incidence that ranges from 0.006% to 0.16% in the third trimester scans (Ezra et al., *Gynecol Obstet Invest* 2003; **56**: 6–9, 2003) and is defined as the presence of the cord between the presenting part of the fetus and the internal cervical os, with or without intact membranes ("Umbilical Cord Prolapse (Green-top Guideline No. 50) | RCOG," n.d.). It may be a transient phenomenon and is usually considered insignificant until ~32 weeks. However, its persistence beyond that gestational age raises the concern of cord prolapse during labor as cervical dilation progresses. Consequently, current bibliography recommends Caesarean delivery when funic presentation is detected during labor making antenatal ultrasound detection a valuable asset in the effort to prevent the complications that cord prolapse has been associated with (Jones et al., *BJOG* 2000; **107**: 1055–7). Cord prolapse is the most significant complication of funic presentation and as such, the antenatal detection of cord presentation cases and the determination of patients that carry an increased risk for UCP are of paramount importance.

It is a mostly unpredictable obstetric emergency, in which the umbilical cord comes through the cervical os in advance of (overt prolapse – usually palpable or even visible within the vagina) or alongside (occult prolapse) the fetal presenting part in the presence of ruptured membranes. The reported incidence of umbilical cord prolapse ranges from 1 to 6 per 1000 pregnancies (Faiz et al., *Saudi Med J* 2003; **24**: 754–7). Though rare, it is associated with high perinatal mortality and morbidity as cord compression and umbilical artery vasospasm may occur preventing blood flow to and from the fetus leading to fetal asphyxia (Critchlow et al., *Am J Obstet Gynecol* 1994; **170**: 613–8).

Case Presentation

A 30-year-old pregnant woman at 32 + 2 weeks of gestation, gravida 5, para 4, pre-

sented to the outpatient clinic of our institution during the third trimester of her pregnancy, due to painless vaginal bleeding. The antenatal course had been otherwise uncomplicated. The woman's past medical history was uneventful.

During her pregnancy, she underwent no prenatal testing except for a first trimester scan at 9 weeks of gestation where the exact gestational age was determined.

She had previously had four uncomplicated pregnancies, having delivered vaginally the first two, while the third and the fourth pregnancies were delivered via caesarean section – the first one because of a footling breech presentation and the other one because of the previous caesarean section. The woman was hemodynamically stable, and the biophysical profile was normal.

The sonographic examination revealed a singleton pregnancy with positive cardiac function and an anterior low-lying placenta with its lower edge 24.8 mm from the internal os (► Fig. 1). The cord insertion was noted to be marginal towards the lower placental edge (► Fig. 1). Furthermore, multiple free loops of the umbilical cord were noted to be running over the internal cervical os (► Fig. 2). The cervix measured 24 mm in length with funneling at the time.

All fetal growth parameters, the amniotic fluid index and the Doppler assessment were within normal range for the gestational age (EFW: 2342gr (89th percentile)).

A single course of antenatal corticosteroids was given at 32 + 2 and 32 + 3 weeks of gestation, due to the fear of an impending umbilical cord prolapse.

The pregnancy was followed up with weekly ultrasound scans. The free loops remained in close proximity to the internal os, lying between the presenting part and the cervix. The pregnancy was monitored until 36 + 0 weeks of gestation, when the patient began complaining of regular contractions, a fact that was confirmed with the use of cardiotocography. A new ultrasound examination was performed with the umbilical cord loops still present between the fetal head and the cervix and an emergency caesarean section was performed.

A live, female newborn was delivered, weighing 3040 g with Apgar scores of 8 and 9 at 1 and 5 minutes, respectively. The gross examination of the placenta confirmed the marginal cord insertion of the umbilical cord (► Fig. 3).

Discussion

Identification and antenatal detection of umbilical cord presentation cases are of utmost importance due to their association with umbilical cord prolapse, which is linked to significant perinatal mortality and morbidity. The current paper presents a case of funic presentation at our department and the management that was carried out and also provides a summary of all of the available published evidence on the association between funic (cord) presentation and cord prolapse. The studies by Vintzileos et al. (*J Clin Ultrasound*. 1983 Nov-Dec; **11**(9): 510–1) and Raga et al. (*J Natl Med Assoc*. 1996; **88**(2): 94–6) describe cord presentation as the precursor to impending cord prolapse, thus highlighting the need for focused ultrasound imaging to diagnose and manage these pregnancies and then to plan the delivery of these fetuses by caesarean section.

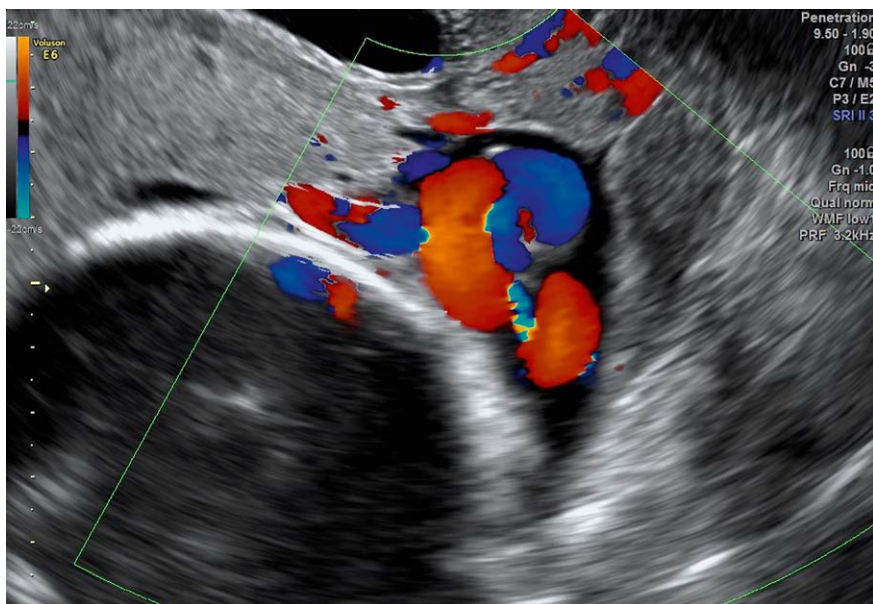
In contrast, (Ezra et al., *Gynecol Obstet Invest* 2003; **56**: 6–9) demonstrated that cord prolapse was preceded by the identification of cord presentation via routine ultrasound in just 12.5% of cases. In addition, a considerable proportion of funic presentation cases diagnosed antenatally resolved spontaneously without resulting in cord prolapse (4 out of 7 turned to vertex presentation), underlining that the two conditions are not synonymous. The authors, however, stated that the sonographic finding of cord presentation carries a significant risk of cord prolapse given the fact that, in their dataset, 1 out of 13 women with cord presentation had a clinical prolapse. Contradictory to the above results, there is some case report evidence underlining the necessity of the assessment of the position of the placental cord insertion in funic presentations since it is the author's



► **Fig. 1** Transvaginal ultrasound revealed a marginal cord insertion in the placenta close to the lower placental edge.



► **Fig. 3** The examination of the placenta postpartum confirmed the marginal cord insertion.



► **Fig. 2** Umbilical cord free loops were detected overlying the cervical internal os.

belief that the anatomic relationship between the internal os and the marginal or velamentous cord insertions would preclude the possibility of such a resolution (Oyelese et al., *Ultrasound Obstet Gynecol.* 2004; 24(6): 692–3).

In terms of following up the pregnancies with cord presentation, there is only one cohort study with historical controls that assessed the efficacy of weekly internal ultrasound examinations in women with breech fetuses after 36 weeks of gestation

(Kinugasa et al., *J Obstet Gynaecol Res.* 2007; 33(5): 612–8). There were no cases of cord prolapse when such a screening method was adopted, in a 10-year period (1995–2005), while in the historic control group there were 10 cases of cord prolapse noted along with one perinatal death in an 11-year period (1983–1994). The authors agreed with Ezra et al. that the two conditions are not synonymous and underlined the importance of serial transvaginal ultrasound assessments given the fact that

there were cases in which there were no funic presentations initially, but they developed eventually.

It is well established that transvaginal ultrasound is the best available modality to diagnose a funic presentation and it is a great tool to differentiate it from vasa previa, a condition in which the fetal vessels traverse the membranes near the internal os in advance of the fetal presenting part. In funic presentation cases, the umbilical cord moves away from the cervix during ultrasound examination whereas in vasa previa the cord remains fixed in place. However, there is currently no definitive consensus regarding the optimal timing of delivery in cases of funic presentation. Some researchers advocate close monitoring in an effort to achieve vaginal delivery, while others recommend scheduled cesarean delivery prior to the onset of labor (Jones et al., *BJOG* 2000; 107: 1055–7). Current evidence, based on the data provided by Ezra et al., is inclined towards a more personalized approach to the condition given the fact that funic presentation will not inevitably lead to prolapse (Jones et al., *BJOG* 2000; 107: 1055–7). However, several cases of cord prolapse did not appear to have detectable cord presentations prenatally. Weekly ultrasound examination could be performed, and vaginal delivery could be considered in cases of resolution of the funic presentation.

Conclusion


The presence of funic presentation has been established as a documented risk factor for cord prolapse and its detection prenatally raises the risk of such an adverse event during labor. Ultrasound assessment

is a well-established tool for the prenatal detection of cord presentation but the evidence regarding the proper management and the timing and mode of delivery is quite limited as it is the result of case reports and retrospective cohorts. The need for randomized controlled studies or case-control studies with a larger sample size should be emphasized in an effort to ameliorate the situation and optimize the management of the care of these pregnant women.

Conflict of Interest

The authors declare that they have no conflict of interest.

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