Journal of Neonatal-Perinatal Medicine 14 (2021) 149–152
DOI:10.3233/NPM-190329
IOS Press

Case Report

Non-invasive fetal electrocardiography ameliorates fetal outcome in chorioangioma: A case report

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Received 24 August 2019
Revised 24 October 2019
Accepted 7 January 2020

Abstract. Chorioangioma is a rare vascular placental tumour. Large chorioangiomas are known to have many maternal and perinatal complications. The case of placental chorioangioma detected via ultrasound is presented. This paper is focused on non-invasive fetal electrocardiography (NI-FECG) clinical use for diagnosing fetal anemia in chorioangioma.

A 22-year-old primigravida was admitted to the department of fetomaternal medicine at 30 weeks of gestation. She had threatened preterm labour, polyhydramnios, and breech presentation. The large echogenic mass of 77 mm × 66 mm × 83 mm, located in the uterine bottom, protruded into the amniotic cavity, and connected to the marginal sinus of the placenta was determined via ultrasound. The sinusoidal pattern of beat-to-beat variations was diagnosed via NI-FECG in spite of normal blood flow velocity in the fetal middle cerebral artery. Therefore, NI-FECG was superior in the detection of fetal anemia. The female baby weighing 1500 g and measuring 42 cm in length, with a head circumference of 30 cm and Apgar score 3⟶5, was delivered by caesarean section. The baby had severe anemia and respiratory distress syndrome.

NI-FECG was a good option for the clinician for the timely and accurate diagnosis of fetal anemia and fetal compromise in placental chorioangioma.

Keywords: Chorioangioma, non-invasive fetal electrocardiography, perinatal complications, fetal compromise

1. Introduction

Chorioangioma is a rare vascular placental tumour. The incidence of chorioangioma is 1–2 % among all pregnancies [1–3]. Chorioangiomas are not voluminous in the majority of cases and do not have any adverse effect on fetal well-being. But large tumours are known to have many maternal and perinatal complications: pre-eclampsia, postpartum haemorrhages, fetal growth restriction, polyhydramnios, fetomaternal transfusion, fetal anemia, low fetal platelet count, neonatal cardiomegaly, cardiac failure, and respiratory distress [3–8]. Chorioangioma could be easily detected via ultrasound. Doppler ultrasound is used for the differentiation from placental teratoma, uterine myoma, and blood clot. This method is also used for the timely diagnosis of fetal anemia [1, 5, 6].

Non-invasive fetal electrocardiography (NI-FECG) is a prospective method for fetal monitoring. NI-FECG has some limitations but it is feasible to detect the true fetal cardiac cycles and rhythm disturbances [9–13]. Since placental abnormalities affect the fetal outcome, the potentials of NI-FECG

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to detect fetal deterioration are of great interest. This paper is focused on NI-FECG clinical use for diagnosing fetal aemia in chorioangioma.

2. Case presentation

A 22-year-old primigravida was admitted to the department of fetomaternal medicine at 30 weeks of gestation. She had a left shoulder fracture and osteomyelitis because of the traffic accident in her anamnesis. She visited the antenatal clinic regularly. First-trimester biochemical tests and ultrasound screenings data were normal. She had threatened preterm labour, polyhydramnios, and breech presentation. The ultrasound was performed. No structural fetal anomalies were found. The length of the cervix was shortened to 14 mm. An amniotic index was 31.8 cm. The fetoplacental (umbilical) hemodynamic doppler variables and blood flow velocity in the fetal middle cerebral artery were normal. The increased resistance for blood flow was detected in both uterine arteries. The large echogenic mass of 77 mm × 66 mm × 83 mm, located in the uterine bottom, protruded into the amniotic cavity, and connected to the marginal sinus of the placenta was determined via ultrasound (Fig. 1). This tumor was found to be highly vascularized predominantly in the region of the chorionic plate on colour doppler

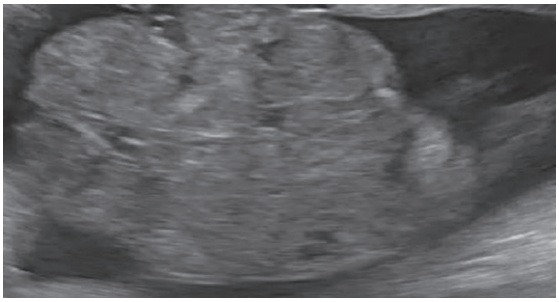

Fig. 1. Ultrasound image of chorioangioma.

imaging. Betamethasone (24 mg) was administered to stimulate fetal lung maturation and intravenous infusion of terbutaline was started for tocolysis. The NI-FECG tracing was obtained from the maternal abdominal wall with the use of the Cardiolab Baby-Card equipment (the XAI Medica Scientific Research Centre, Ukraine) [10, 11]. The study protocol was approved by the Bioethics Committee of the Kharkiv Medical Academy of Postgraduate Education (registration number 0116U002865). The data of NI-FECG demonstrated the suppressed fetal autonomic tone with the sinusoidal pattern of beat-to-beat variations curve (an analogue of the ultrasound cardiotocography curve) (Fig. 2). The preterm rupture of the fetal membrane occurred the next day. The registration of NI-FECG has been performed again.

Fig. 2. The sinusoidal pattern of beat-to-beat variations. The upper line is fetal beat-to-beat variations curve and the lower one is maternal. The line crossing the fetal heart rate pattern shows the estimated basal heart rate (baseline).

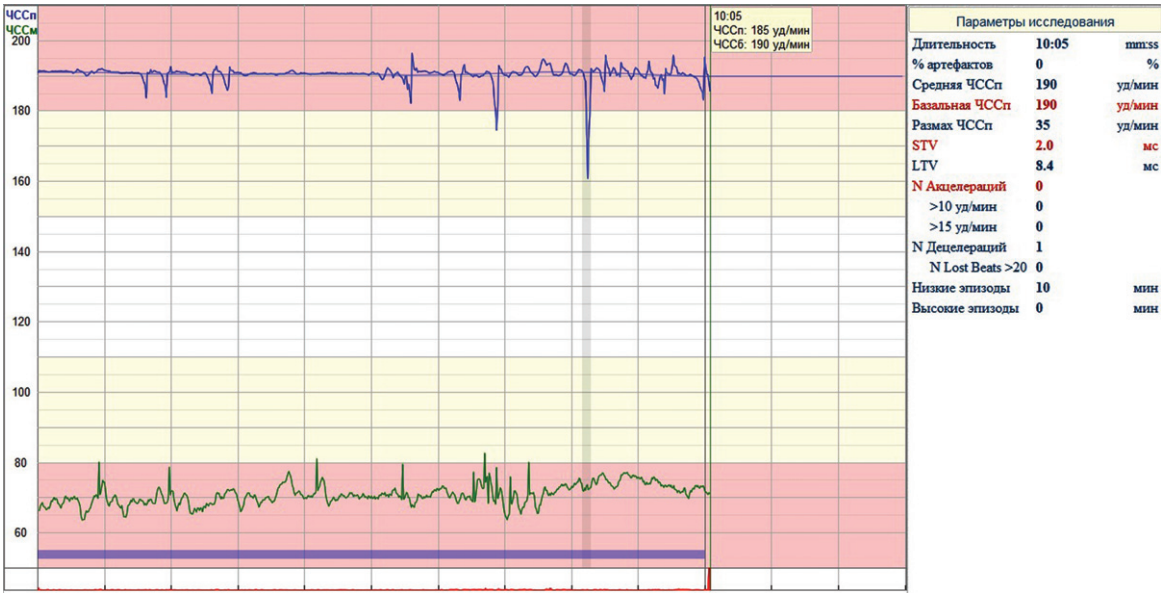

Fig. 3. The tachycardia and nonreactive type of beat-to-beat variations with deceleration shaded grey.

The tachycardia (basal heart rate of 190 beats/min) and nonreactive pattern of beat-to-beat variation were revealed (Fig. 3). The lack of accelerations and very low short term variation (STV) (2.0 ms) were detected. These variables featured fetal distress.

The female baby weighing 1500 g and measuring 42 cm in length, with a head circumference of 30 cm and Apgar score 3⟶5 was delivered via caesarean. The baby had severe anemia (Hb-50 g/l) and respiratory distress syndrome.

The newborn was admitted to the neonatal resuscitation unit and was sent home 56 days later.

3. Discussion

Since the placental mass was a reason for gestational and perinatal pathology, this clinical case showed a necessity for the diagnosis of placental chorioangioma. This tumour is similar to a peripheral arteriovenous shunt [1, 4, 8]. The potentials of fetal surgery are known in the treatment of chorioangioma [14]. But preterm fetal membrane rupture, breech presentation, and fetal compromise were reasons for the abdominal route of delivery. The conventional chorioangioma complications were found: preterm birth, polyhydramnios, respiratory distress syndrome, and fetal anemia. But cardiomegaly, cardiac failure, and hydrops were not detected. The connection of the tumor to the placenta in the region of the marginal sinus was atypical [1, 3, 5, 8].

The use of NI-FECG for the detection of fetal deterioration in placental chorioangioma was shown for the first time. In spite of normal blood flow velocity in the fetal middle cerebral artery, a sinusoidal pattern of beat-to-beat variations was diagnosed via NI-FECG. Therefore, NI-FECG was superior in the detection of fetal anemia. The pathogenesis of this complication could be associated with the sequestration of fetal red blood cells in the vascular bed of chorioangioma or fetomaternal transfusion [3, 4, 6]. NI-FECG contributed to the diagnosis of fetal compromise and provided a beneficial perinatal outcome. This thesis should be supported by further investigations.

4. Conclusion

NI-FECG was a good option for the clinician for the timely and accurate diagnosis of fetal anemia and fetal compromise in placental chorioangioma.

Acknowledgments

None.

Competing interests

No conflict of interest was declared by the author.

Funding

The author declared that this study has received no financial support.

Patient consent

The patient gave her informed consent to participate in the study. The patient provided written informed consent for the publication and the use of their images.

Ethical approval

The study was approved by the Research Council and Ethical Committee of Kharkiv Medical Academy of Postgraduate Education, No 29.0619p and performed in accordance with the principles of the Declaration of Helsinki.

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