ORIGINAL PAPER https://doi.org/10.61785/ael/174961

Prenatal diagnosis of chorioangioma – series of cases and management options

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Publishing info

Received: 2023-10-09
Accepted: 2023-11-07
Online first: 2023-12-27

Keywords
embolization
placenta
chorioangioma
fetoscopy
intrauterine transfusion

Abstract

Introduction: Large chorioangioma is one of the causes of fetal anemia and heart failure as well as preterm deliveries.

Aim: The aim of the study was to assess the clinical implications of prenatal diagnosis of chorioangioma and present new treatment options: laser coagulation and embolisation of feeding vessles.

Material and methods: Chorioangioma was diagnosed in 5 patients (4 singleton pregnancies and 1 dichorionic twin pregnancy). Ultrasound examinations and routine follow-up were performed in these women to detect possible fetal and maternal complications caused by the placental tumor. Pregnancy management, including invasive procedures and outcome, was analyzed.

Results and discussion: A high proportion of the patients in the study group (80%) required prenatal intervention due to the fetal heart failure or polyhydramnios. Three patients underwent laser coagulation of superficial supplying vessels; embolization of the deep vessel in the tumor was performed in 1 woman with dichorionic twin gestation. One woman opted for termination of pregnancy following an ineffective laser procedure. One pregnancy (20%) was uncomplicated and managed conservatively. In the group of 4 patients after prenatal treatment, all women gave birth to viable neonates; however, in the case of twin gestation, the affected fetus expired.

Conclusions: Prenatal diagnosis of chorioangioma should entail a detailed follow-up of the patient to detect pregnancy complications early enough to introduce intrauterine treatment, preventing intrauterine fetal demise.

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1. Introduction

Chorioangioma is the most common tumor of the placenta and is found in approximately 1% of pregnancies.[1] Clinically, the size of the tumor is the most important feature. Lesions smaller than 5 cm are usually benign and no pregnancy complications are observed; often, the diagnosis is determined postnatally. With the increasing size of the tumor the risk of preeclampsia, placental abruption, preterm delivery, polyhydramnios, fetal growth restriction (FGR), fetal anemia, fetal heart failure and non-immune hydrops increases.[2–4]

2. Aim

The purpose of the study was to assess the clinical implications of prenatal diagnosis of chorioangioma and present new treatment options: laser coagulation and embolisation of feeding vessles.

3. Material and methods

All the patients diagnosed with placental chorioangioma during pregnancy, with singleton or multiple pregnancy, with no other maternal or fetal pathology, were included in the study. We intended to exclude patients with previously diagnosed hypertension, diabetes or any other maternal chronic disease, women with fetal malformations, serological immunization and intrauterine infection, but no patient with chorioangioma met exclusion criteria.

A prospective, observational study was performed to assess the pregnancy complications, management, and outcome in the group of women with chorioangioma diagnosed during pregnancy. During the analyzed period, 8078 patients were hospitalized at the Department of Obstetrics of Medical University of Gdańsk, Poland. Out of the total number of patients, 5 cases of chorioangioma (1 : 1600) were diagnosed prenatally.

Pregnancy complications, including pregnancy induced hypertension (PIH), placental abruption, polyhydramnios, FGR, fetal anemia, fetal heart failure, and non-immune hydrops, as well as pregnancy outcomes were analyzed.

PIH was diagnosed when the blood pressure was 140/90 mm Hg or higher.[5] Polyhydramnios was defined as maximal vertical pocket (MVP) of 8 cm or more,[6] or amniotic fluid index (AFI) of 25 cm or more.[7] FGR was confirmed when estimated fetal weight (EFW) was lower than the 10th percentile.[8] Fetal anemia was diagnosed when peak systolic volume (PSV) in middle cerebral artery (MCA) was 1.5 MoM or more.[9] Fetal heart failure was described as cardio-vascular score (CVS) of 7 or less points.[10] Non-immune hydrops was diagnosed when no maternal immunization was detected and patient presented with both tissue edema and an effusion in at least one body cavity.[11]

4. Results

The median maternal age in the analyzed group was 28 years (age ranged between 26 and 36 years). Chorioangioma was diagnosed between 20 and 27 weeks of gestation (median gestational age was 25 weeks). Size of the tumor was 5 cm or more in 4 cases; in 1 case it was smaller (4 cm). Median diameter of the tumor was 8 cm (4–10 cm). Pregnancy complications are presented in Table 1.

All complications were observed in patients with large tumors (more than 5 cm). Median size of the tumor in this group was 8 cm (6–10 cm).

Prenatal invasive procedures were performed in 4 out of 5 patients from the group with prenatal diagnosis of chorioangioma. In 3 cases, patients were scheduled to laser photocoagulation of the superficial supplying vessels (Figure 1), in 1 case (twin gestation) – to sclerotherapy of the deep supplying vessel due to fetal complications (Table 2).

Table 1. Pregnancy complications in patients with prenatally diagnosed chorioangioma.

Type of pregnancy complication	*N*	%
PIH	0	0
Polyhydramnios	3	60
IUGR	1	20
Fetal anemia	2	40
Fetal heart failure	3	60
Hydrops	1	20

Table 2. Indications for prenatal intervention in patients with prenatal diagnosis of placental chorioangioma.

	Fetoscopy (3 patients) *N*	Sclerotherapy (1 patient) *N*
Fetal heart failure	2	1
Polyhydramnios	3	0
Fetal anemia	1	1

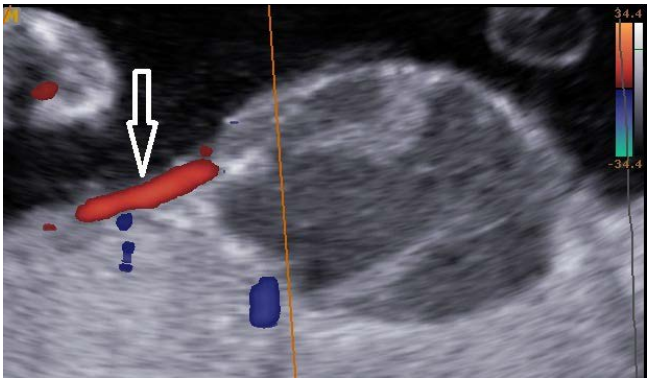

Figure 1. Superficial vessel supplying chorioangioma (arrow).

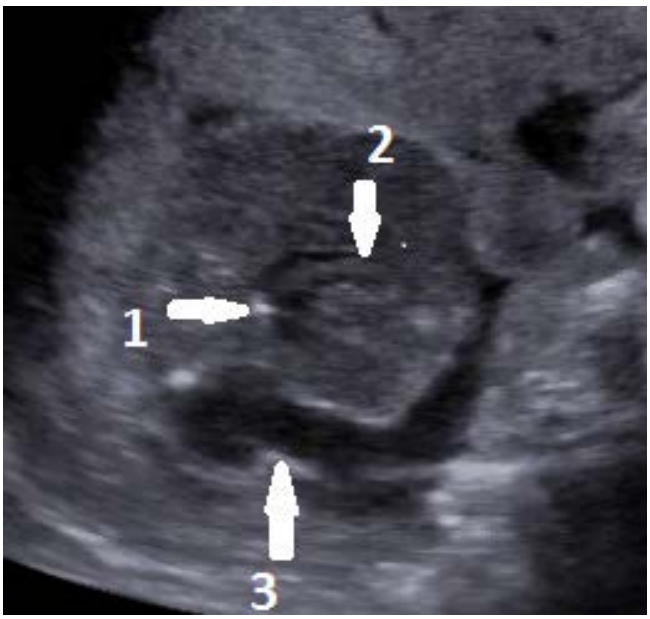

Figure 2. Sclerotherapy of chorioangioma.

In 1 case, where the tumor was sized at 8 cm and the patient was scheduled for laser therapy, an additional vessel deep in the middle of the tumor was also present. In this case, fetal heart failure did not resolve after surgery. The woman was offered embolization of the deep vessel, but chose termination of the pregnancy. Performance of the fetal heart improved following fetoscopy in 2 subjects. However, despite this improvement, 1 of the fetuses required 2 intrauterine transfusions in the 1st week after surgery; afterwards, there was no need for further treatment.

In the case of dichorionic twin gestation, umbilical cord insertion of one of the fetuses was localized on the surface of the tumor (diameter of the tumor was 8 cm), and umbilical vessels were surrounded by tumor tissue. Severe fetal anemia and heart failure were observed in the affected twin. Intrauterine transfusion was performed and aethoxysclerol was infused to the artery supplying chorioangioma to achieve embolization (Video 1, see online version of the paper). The affected twin expired during the first 24 h after the procedure, probably due to the compression of the umbilical vessels by tumor tissue hardening following embolization. The pregnancy was continued until the 32nd week, at which time 1 live child was delivered vaginally.

In 1 case, chorioangioma (4 cm) did not need any prenatal intervention, and no complications during pregnancy were observed.

Pregnancy outcome in all the patients with chorioangiomas diagnosed prenatally is presented in Table 3. Survival of the fetuses affected with placental chorioangioma diagnosed prenatally was 3 out of 5 (67%); however, after excluding termination of pregnancy, this value was found to be 3 out of 4 (75%).

5. Discussion

Our study showed, that large placental chorioangioma usually cause fetal complications and require intervention. In our series laser treatment was safe and effective. Embolization in 1 of patients failed probably due to unfortunate umbilical vessels insertion.

Chorioangioma may cause fetal heart failure, anemia, and other pregnancy complications depending on the size and vasculature of the tumor.[2–4] Various management options have been proposed for cases requiring intervention. Fetal anemia should be treated with intrauterine transfusion, repeated as many times as necessary.[2,4,12] Although anemia was not the main problem in any of the cases in the analyzed group, it was confirmed in 2 patients with heart failure as an additional feature.

Isolated polyhydramnios may be treated with serial amnioreduction or indomethacin.[12,13] In cases complicated by polyhydramnios and fetal heart failure, amnioreduction is only part of the treatment as only the closure of the vessels supplying the tumor may improve the fetal heart performance. Quintero reported ligature of the vessels visible on the surface of the placenta after separating them from the placenta in fetoscopy,[14] while laser coagulation of deep vessels was proposed by Bhide.[3] We did not offer those types of therapy to any of our patients.

Lau, Sepulveda, Wanapirak, and Nicolini performed the embolization of the supplying vessels with the use of microcoils, alcohol, and enbucrilate.[12,15–18] We used aethoxysclerol for this purpose. Failure of the method in our patient was probably caused by the localization of the umbilical cord insertion – the umbilical vessels going through the chorioangioma were compressed by the tissue hardening following embolization. On the other hand, it was also possible that the material used for embolization was transported to the umbilical vessels and closed them directly, similarly to one of the cases described by Sepulveda.[12]

Laser coagulation of superficial vessels supplying the tumor, as described by Quarello,[19] gave good results in our group. The use of this method is reserved for the patients with superficial vessels supplying the tumor. In 1 case, where there was also 1 deep vessel, we hoped that closing the superficial supply would decrease blood flow

Table 3. Pregnancy outcome in patients with prenatal diagnosis of placental chorioangioma.

Outcome	Values
Preterm delivery, *n* (%)	4 (80)
Intrauterine fetal demise, *n* (%)	1 (20)
Termination of pregnancy, *n* (%)	1 (20)
Gestational age at delivery, median (min–max), weeks	34 (31–40)
Birth weight, median (min–max), g	2685 (1570–3550)

to the tumor and, consequently, the performance of the fetal heart would improve, but the surgery was found to be ineffective. The procedure was only effective in the cases with superficial supply, initiating the resolution of polyhydramnios and fetal heart failure. Probably interstitial laser would be a better option in this case, giving good results according to Hosseinzadeh review.[20]

6. Conclusions

According to the results of the performed observational study and taking into account the available literature, management of chorioangiomas diagnosed during pregnancy must be individualized. Decision on the employed prenatal intervention has to be based on the observed complications and the type of procedure should be chosen according to the ultrasound image of the supplying vessels. It would be very interesting to compare different management options in a randomized study. However there are two problems. Due to poor results of conservative management it would be very difficult to obtain permission of ethical committee and due to a rare occurrence – to find adequate number of patients to conduct such a study.

CONFLICT OF INTEREST

Not declared.

FUNDING

Not declared.

ETHICS

Presented study is an observational study, and it did not require ethical committee permission.

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