PRENATAL DIAGNOSIS OF A GIANT PLACENTAL CHORIOANGIOMA WITH FAVORABLE MATERNAL AND NEONATAL OUTCOMES: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

INTRODUCTION: Placental chorioangioma is the most common benign tumor of the placenta. Although most lesions are small and asymptomatic, giant chorioangiomas (>5 cm) are rare and may result in serious maternal and fetal complications including polyhydramnios, fetal anemia, hydrops fetalis, and preterm delivery. Early diagnosis using ultrasonography and color Doppler is essential for appropriate surveillance and timely intervention.

CASE PRESENTATION: A 22-year-old primigravida at 36 weeks of gestation was referred after routine obstetric ultrasound detected a placental mass. The ultrasound showed a 6.5×7.5 cm vascular placental lesion arising near umbilical cord insertion, consistent with a giant chorioangioma, together with polyhydramnios. Initial fetal Doppler assessment showed no evidence of fetal anemia. The patient was managed conservatively with close maternal and fetal surveillance. During admission, the tumor enlarged, polyhydramnios worsened, and middle cerebral artery peak systolic velocity suggested fetal anemia. An emergency cesarean section was performed because of non-reassuring fetal status. A healthy female infant weighing 2.7 kg was delivered and was successfully treated for neonatal anemia with blood transfusion. Histopathological examination confirmed placental chorioangioma. Both mother and infant were discharged in good clinical condition.

CONCLUSION: Giant Placental chorioangioma is associated with significant maternal and fetal morbidity. Careful antenatal surveillance using ultrasonography and color Doppler allows timely recognition of complications and appropriate management. This case demonstrates that favorable maternal and neonatal outcomes can still be achieved through close monitoring and timely delivery even in resource-limited settings.

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INTRODUCTION

Placental chorioangioma is a benign tumor that arises from the abnormal proliferation of vessels from the chorionic mesenchymal tissue. It infiltrates the stroma of enlarged placental villi, predominantly perfusing it with fetal circulation. Most of these tumors are observed in the third trimester and less commonly in the second trimester of pregnancy as solitary or multiple nodules[1].

Placental chorioangioma is the most common tumor of the placenta, with a reported prevalence of 1% of all pregnancies[2]. However, many authors argue that their true prevalence remains unknown since most are diagnosed incidentally by antenatal ultrasonography examination, and many are undetected due to their small and innocuous size[3].

In placental chorioangioma, the clinical significance is determined by the tumor size. Most of the tumors are small, less than 4cm, and are usually asymptomatic and remain undiagnosed. In contrast, large chorioangiomas larger than 5cm in diameter are rare, with a prevalence ranging from 1:9,000 to 1:50,000, and are often associated with adverse maternal and fetal outcomes[4].

Complications are mainly associated with large chorioangioma, which are associated with significant arteriovenous shunting within the placenta, leading to fetal anemia, high output cardiac failure, fetal hydrops, polyhydramnios, fetal distress, intrauterine growth restriction, and stillbirths. Complications such as fetal microangiopathic anemia and thrombocytopenia can also occur due to sequestration of red blood cells and platelets by the tumor. The increased urine output with transudate from the tumor vessels across the chorionic plate is associated with fetal hyperdynamic circulation caused either by fetal anemia or shunting of blood to placental chorioangioma, leading to polyhydramnios, which in turn, can cause maternal discomfort due to uterine overdistention, an increased risk of preterm labor, preterm prelabor rupture of membrane, abruptio placenta, and postpartum hemorrhage[4,5].

The exact cause of placental chorioangioma is unknown; however, it is believed to be caused by malformation of primitive angioblastic tissue of the early placenta and has no malignant potential.

The main determinants of the prognosis of the outcomes in placental chorioangioma are the size of the mass and the presence of fetal hydrops,which will impact the pregnancy management, such as frequent visits and the need for antenatal fetal surveillance[3].

This report aims describes the successful conservative management of giant placental chorioangioma complicated by severe polyhydramnios and suspected fetal anemia in a resource-limited setting. The case highlights the importance of early prenatal diagnosis, close maternal and fetal surveillance, timely obstetric intervention, and the challenges encountered when advanced fetal therapeutic procedures are unavailable.

Case presentation

A 22 – year-old primigravida female at gestational age of 36 weeks, was referred from a primary health facility after a routine obstetric ultrasound identified placental mass of uncertain origin. The pregnancy had been uneventful, and she reported normal fetal movements. She had attended regular antenatal care since 1 weeks of gestation, and routine antenatal investigations were unremarkable. On admission, the patient was in good general condition with normal vital signs. Obstetric examination revealed a singleton pregnancyin breech presentation with fundal height of 36cm and a fetal heart rate of 143 beats/minute.

A transabdominal ultrasound was done, which revealed a singleton viable pregnancy at 36 weeks and 3 days of gestation with polyhydramnios (single deepest pocket (SDP) of 10cm). A well-circumscribed hypoechoic placental mass measuring 6.5cm×7.5 cm was identified near the umbilical cord insertion on the fetal surface of the placenta. Color Doppler examination showed marked vascularity within lesion, consistent with a giant chorioangioma (Image 1). There were no sonographic signs of hydrops

fetalis. Doppler assessment revealed an MCA-PSV of 43.84 cm/s (1.0 MoM for gestational age, <1.5 MoM, which was below the threshold suggestive of fetal anemia. However, interpretation of MCA-PSV after 35 weeks of gestation loses its mathematical correlation with fetal hemoglobin levels. This results in a higher rate of false positives (incorrectly predicting anemia).To confirm severe anemia at this stage, doctors usually rely on amniocentesis or delver the fetus if maturity allows. Umbilical artery Doppler findings were normal. Baseline laboratory investigations were unremarkable except for elevated maternal serum Alpha-fetoprotein (AFP) (335.3 ng/mL) and beta-human chorionicgonadotropin (hCG) (54,297 mIU/mL).

Table 1:Initial work-ups were done as shown below;

TEST	RESULTS	NORMAL RANGE
Hemoglobin	13.0 g/dl	>11g/dL
MCV	86.4	80-100Fl
MCHC	33	32-36g/dL
Platelets	357 x 109/L	150-450 x 109/L
Blood group/Rh typing	O positive	
Hepatitis B	Negative	
HIV	Negative	
Syphilis	Non-reactive	
hCG	54,297 mIU/mL	<5mIU/mL
AFP	335.3 ng/mL	10 to 150 ng/mL

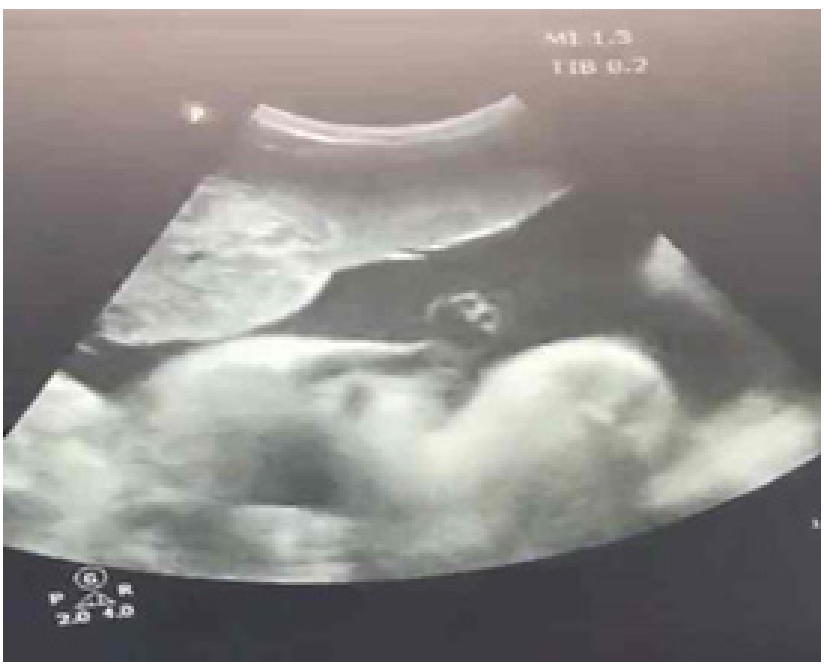

Image 1: Ultrasound image showing B-mode picture of polyhydramnios and placental mass giant chorioangioma of 6.5 cm x 7.5 cm, well-circumscribed mass extending beyond the placental margin.

After counseling regarding the diagnosis, potential maternal and fetal complications, and available management options, the patient was admitted for close maternal and fetal surveillance. Antenatal corticosteroids were administered through intramuscular injection of dexamethasone 6mg 12 hourly for 48 hours to accelerate fetal lung maturity in anticipation of possible preterm delivery. Therapeutic amnioreduction was considered; however, the procedure could not be perfomed because the hospital lacked the fetal medicine specialist.

During hospitalization, the fetus was closely monitored with serial ultrasonography, Doppler assessment, and fetal surveillance. Three days after admission, polyhydramnios had increased despite a reassuring fetal condition. On the 6th day of admission (36 weeks and 6 days of gestation), she developed persistent abdominal pain, marked abdominal distention,and reduced fetal movements. Repeat ultrasonography demonstrated enlargement of the placental mass of 9cm by 10cm with worsening polyhydramnios (single deepest pocket of 15 cm). MCA-PSV had increased to 74.26 cm/s (1.7 MoM), suggesting fetal anemia (Image 2), while the biophysical profile score had decreased to 2/10, indicating non-reassuring fetal status.

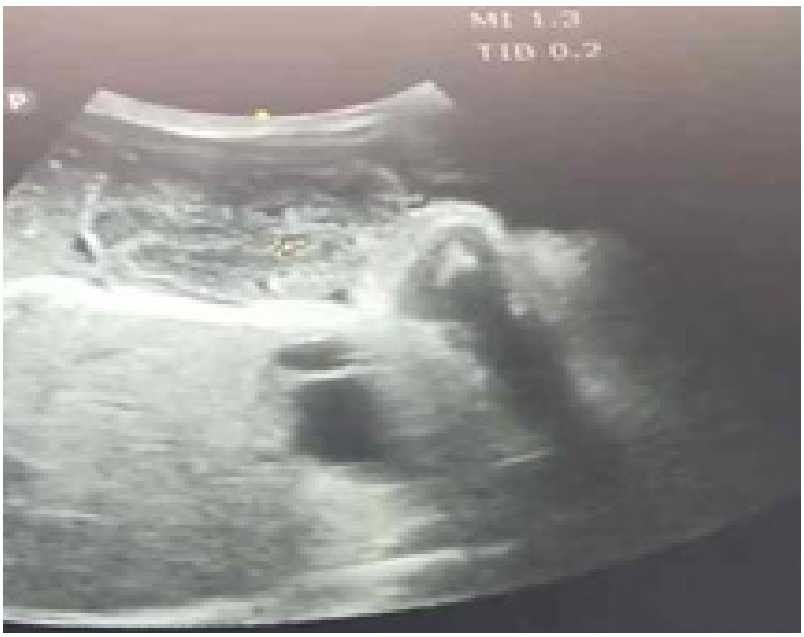

Image 2: Ultrasound image showing B-mode picture of increased size of the placental mass (giant chorioangioma) of 9 cm x 10 cm, well-circumscribed mass extending beyond the placental margin.

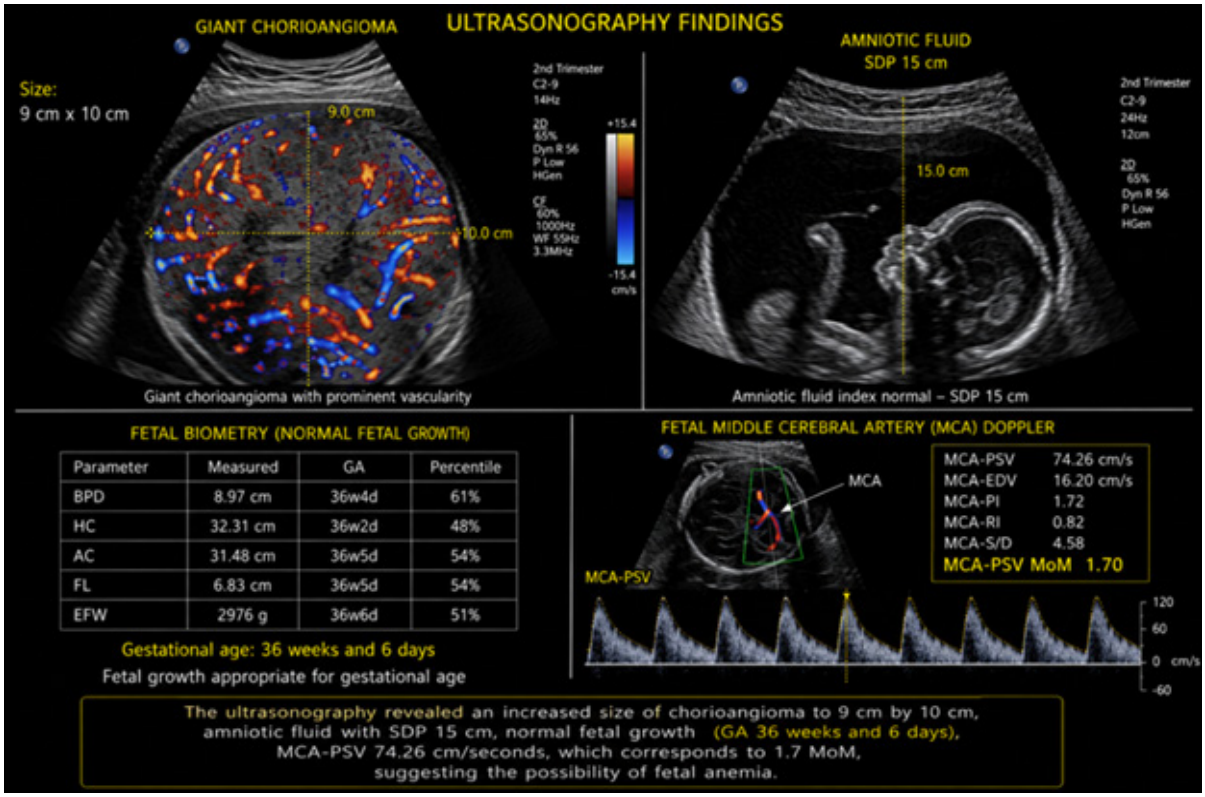

Image 2A: MCA-PSV/Color Doppler

In view of progressive maternal symptoms, worsening polyhydramnios, suspected fetal anemia, and fetal compromise, an emergency category II cesarean section was performed. A live female infant weighing 2.7 Kg was delivered with an APGAR score of 8 in the 1st minute and 10 in the 5th minute, respectively. Approximately, 5L of meconium-stained amniotic fluid was drained. Gross examination revealed a giant placental chorioangioma measuring 11 cm by 10cm attached near umbilical cord insertion (image 3). The placenta was submitted for histopathological examination, which confirmed a benign placental chorioangioma (Image 4).

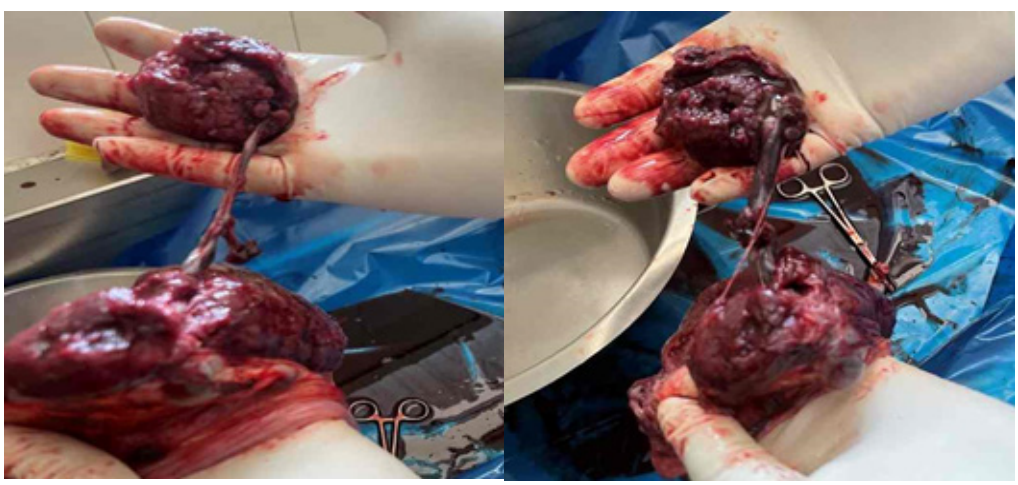

Image 3: Gross examination of the placenta showing a chorioangioma with the stalk connecting to the placenta.

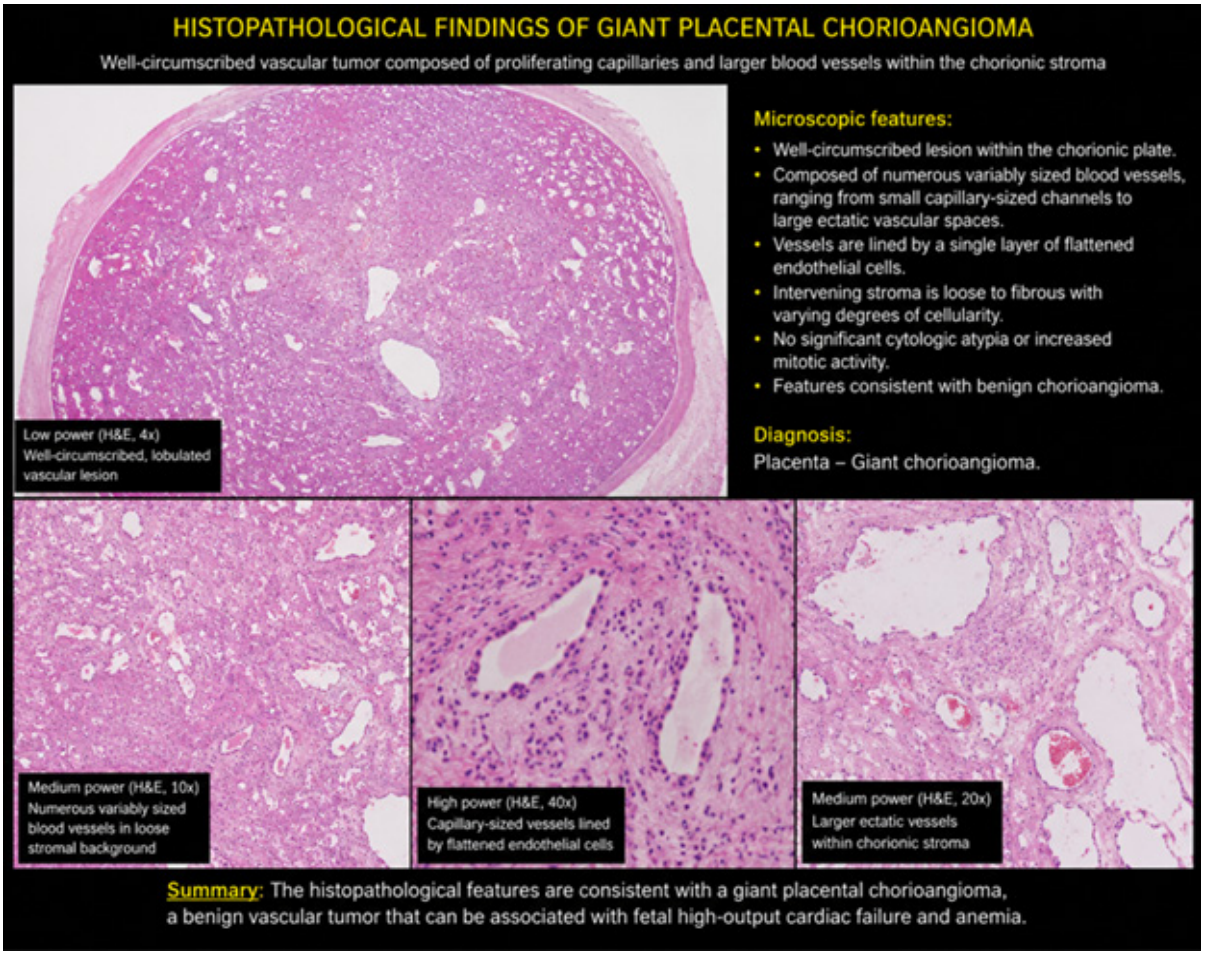

Image 4: The histopathology/ photomicrograph of the Vascular Neoplasia

The baby was taken to the Neonatal Intensive Care Unit (NICU) because of anemia (hemoglobin (Hb) 8 g/dl) and received two whole blood transfusions within the first 48hrs of life, after which the hemoglobin increased to 13g/dl. Echocardiography was normal.The neonate was discharged on day 3, and the mother was discharged in good clinical condition on postoperative day 4.

DISCUSSION

Giant placental chorioangioma is an uncommon placental vascular tumor associated with significant maternal and fetal morbidity, first described by Clarke in 1798. It resembles a hemangioma as a benign vascular neoplasm, but its precise cause is still unknown. This condition is often associated with metabolic disorders like hypertension and diabetes mellitus, as well as higher maternal age (over 30), female infants, and multiple pregnancies. In our case, the patient was 22 years old and a primigravida, which differs from these known associations.

The recurring risk associated with this tumor is still unknown but is generally considered very low. Some describe chorioangioma as a hamartoma or a hyperplastic capillary lesion rather than a true neoplasm, because it cannot metastasize and has no malignant potential. Additionally, a chorioangioma can lead to elevated maternal serum alpha-fetoprotein levels, which can help diagnose.

Chorioangioma usually develops on the 16th day after fertilization, and there have not been cases of chorioangioma in the first trimester. It is usually found as a solitary nodule in the third trimester, with the most common location being on the fetal side of the placenta in close proximity to the umbilical cord insertion. Chorioangioma typically develops in areas with reduced blood flow, likely caused by hypoxia. This hypoxic state, driven by vascular growth factors, encourages active proliferation of connective tissue and the growth of villous capillaries. The occurrence of chorioangioma is also associated with pre-eclampsia, high altitude pregnancy, and fetal anemia, suggesting that decreased oxygen tension may play an important role in the pathogenesis[7].

In placental chorioangioma, the clinical significance is determined by the size of the tumor. The majority of the tumors are small, less than 4cm, and are usually asymptomatic and remain undiagnosed. In contrast, large chorioangiomas larger than 5cm in diameter are rare, with a prevalence ranging from 1:9,000 to 1:50,000, and are often associated with adverse maternal and fetal outcomes[4]. In our case, the patient had a tumor measuring 11 cm x 10 cm following delivery.

Complications mainly occur with large chorioangiomas, which involve significant arteriovenous shunting within the placenta. This can lead to fetal anemia, high-output cardiac failure, fetal hydrops, polyhydramnios, fetal distress, intrauterine growth restriction, and stillbirths. Additionally, fetal microangiopathic anemia and thrombocytopenia may develop due to sequestration of red blood cells and platelets by the tumor. The increased urine output, along with transudate from tumor vessels crossing the chorionic plate, is linked to fetal hyperdynamic circulation caused either by fetal anemia or blood shunting to the placental chorioangioma. This can result in polyhydramnios, which may cause maternal discomfort from uterine overdistention, and increase the risks of preterm labor, preterm prelabor rupture of membranes, placental abruption, and postpartum hemorrhage[4,5]. In our case, initially the patient had polyhydramnios, although later on the Doppler ultrasonography showed the MCA-PSV 74.26 cm/seconds, corresponding to 1.7 MoM, suggesting the possibility of fetal anemia and the BPP of 2, revealing non-reassuring fetal status, which required immediate delivery.

The prognosis of placental chorioangioma primarily depends on the tumor size and the presence of fetal hydrops, which influence pregnancy management, such as more frequent visits and antenatal fetal monitoring. In our case, the chorioangioma measured 11 cm by 10 cm, making it large enough to cause several complications. Nevertheless, the fetus did not develop hydrops.

Placental chorioangioma can be detected during prenatal checkups using gray-scale sonography, color flow Doppler, and MRI. On ultrasound, it appears as a hypoechoic, rounded, well-defined placental mass with either uniform or mixed internal features, located on the fetal side of the placenta. Changes such as calcification, degeneration, or necrosis can

alter its ultrasound appearance. Color flow Doppler helps differentiate placental chorioangioma from other placental lesions and confirms its vascular nature. In this case, it was diagnosed through ultrasonography, with the diagnosis supported by elevated serum AFP, which increased the likelihood of placental chorioangioma as shown on Image 2A. Placental chorioangioma can be diagnosed during antenatal visits using gray-scale sonography, color flow Doppler ultrasonography, and Magnetic Resonance Imaging (MRI). On ultrasound, placental chorioangioma appears as a hypoechoic, rounded, well circumscribedplacental masses homogeneous or heterogeneous internal architecture located on the fetal surface of theplacenta. Calcification, degeneration, or necrosis of the tumor may cause a different appearance on the ultrasound. The application of color flow Doppler can be used to differentiate the placental chorioangioma from other placental lesions and to confirm the vascular component of the tumor. On MRI, placental chorioangioma appears as a heterogeneous mass, which can be used in conjunction with ultrasound findings[6].

Giant chorioangiomas should be managed based on the presence and severity of related complications. Many cases are treated conservatively with close monitoring through serial ultrasounds and Doppler studies. Reported treatment options include alcohol-based chemosclerosis, fetoscopic or interstitial laser ablation of feeding vessels, embolization, medical therapy with propranolol, and surgical vessel ligation. In cases of severe polyhydramnios, amnioreduction can provide temporary relief. Intrauterine transfusion may correct hematologic imbalances in hyperdynamic fetal circulation, especially when significant anemia is present. In this case, the patient needed amniocentesis; however, limited resources prevented this due to lack of fetal medicine specialist. The increased MCA-PSV indicated a higher risk of fetal anemia, for which fetal sampling could have been performed, and intrauterine infusion could have been beneficial, but resource limitations hindered this approach. Consequently, the pregnancy was closely monitored until signs of fetal anemia, non-reassuring fetal status, and maternal distress due to severe polyhydramnios appeared.

There are no established guidelines in Tanzania for managing placental chorioangiomas, and it is usually not a reason to perform a Cesarean section. Typically, vaginal delivery is preferred over Cesarean for a large placental hemangioma. In our case, the patient underwent a Cesarean due to non-reassuring fetal status and a giant chorioangioma, considering the potential risk of rupture and severe bleeding that could threaten fetal life.

Conclusion

This case demonstrates that giant placental chirioangioma can be successfully managed with close maternal and fetal surveillance, even in resource-limited settings where advanced fetal therapeutic interventions are unavailable. Serial ultrasonography , color Doppler assessment, and timely recognition of maternal and fetal deterioration were essential in guiding the timing of delivery and achieving favorable maternal and neonatal outcomes. This case also highlights the importance of early referral to a tertiary care center and the need to strengthen fetal medicine services to improve the management of complicated placental chorioangioma in low-and middle-income countries.

Declaration of use of Artificial Intelligence (AI)

AI was not used in the development of this manuscript.

Ethical clearance

This paper is a case report and not a research study. Therefore, ethical approval was not necessary.

Informed consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal upon request.

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