CASE REPORT

Placental abruption after amnioreduction for polyhydramnios caused by chorioangioma

Angela Kim, Megan A Economidis, Hindi E Stohl

Department of Obstetrics and Gynecology, Harbor UCLA Medical Center, Torrance, California, USA

Correspondence to
Dr Angela Kim,
akimfajilan@gmail.com

Accepted 10 February 2018

SUMMARY

Placental chorioangioma is the most common type of a benign placental tumour that occurs in 1% of pregnancies. A large chorioangioma is associated with adverse pregnancy outcomes. We present a case of placental abruption necessitating preterm delivery after multiple amnioreductions for polyhydramnios caused by a large chorioangioma. If antenatal diagnosis of a significant chorioangioma is made as the cause of polyhydramnios, caution should be taken when performing rapid amnioreductions.

BACKGROUND

Placental chorioangioma is a rare, benign placental tumour that arises from abnormal proliferation of vessels from chorionic tissue.¹ Large chorioangiomas greater than 4–5 cm are associated with fetal morbidity, such as high cardiac output failure due to arteriovenous shunting, platelet consumption and preterm delivery.^{2,3} Chorioangiomas are also associated with polyhydramnios. Polyhydramnios has been associated with premature rupture of membranes, premature labour and placental abruption.^{4,5} While there are multiple accounts of polyhydramnios and risk for placental abruption, little has been mentioned in the literature regarding chorioangiomas as potential cause for clinically significant placental abruption.

We present a patient with chorioangioma-associated polyhydramnios and placental abruption after multiple amnioreductions.

CASE PRESENTATION

A multigravid patient in her 30s transferred her prenatal care at 25 6/7 weeks' gestation due to a diagnosis of polyhydramnios. Her pregnancy was otherwise uncomplicated. She had two prior term caesarean deliveries. She denied any medical history. Ultrasound was notable for a morphologically normal fetus without evidence of ascites or hydrops. Amniotic Fluid Index (AFI) was 38 cm. Estimated fetal weight was 1295 g, and transvaginal cervical length (TVCL) was 4.3 cm. Prenatal laboratory tests, including a 1-hour glucose tolerance test, were unremarkable. In a follow-up ultrasound 1 month later, appropriate interval fetal growth and a normal-appearing lateral placenta but with persistence of polyhydramnios (AFI of 35.5 cm) were noted.

TREATMENT

The patient was subsequently admitted to labour and delivery at 31 4/7 weeks' gestation with painful

uterine contractions and concern for preterm labour. Ultrasound was notable for a deepest vertical pocket (DVP) of greater than 20 cm (AFI was not reported). The patient was treated with tocolysis and received betamethasone for fetal lung maturity. Continuous fetal and contraction monitoring were performed given the high risk for preterm labour, premature rupture of membranes and placental abruption. She then underwent an amnioreduction under ultrasound guidance and with continuous fetal monitoring. Approximately 2500 mL of amniotic fluid was removed using an 18-gauge spinal needle connected to vacutainers at a rate of 100 mL/min. Fetal chromosomal karyotype, microarray, alpha-fetoprotein, herpes simplex virus, cytomegalovirus, *Parvovirus*, HIV and syphilis on the amniotic fluid were all sent and were within normal limits. Fetal status was reassuring throughout the procedure as well as postprocedure.

While the patient initially had symptomatic relief, painful regular contractions resumed a couple of days later. Her AFI was 42 cm. Her contractions were refractory to conservative treatments. The patient therefore underwent a second amnioreduction procedure with the removal of an additional 2700 mL of fluid. Her contractions abated and she achieved symptomatic relief. Fetal heart monitoring during the procedure and for several hours thereafter demonstrated a baseline of 140 beats/min with moderate variability and accelerations. However, approximately 12-hour postprocedure, fetal heart rate baseline increased to a baseline of 160 beats/min, had prolonged periods of minimal variability and was without accelerations. On a biophysical profile, the absence of gross movements, fine movements and fetal breathing were noted. Fetal vibroacoustic stimulation failed to result in an appropriate response. The decision was therefore made to proceed with urgent repeat caesarean delivery at 32 1/7 weeks' gestation.

OUTCOME AND FOLLOW-UP

At delivery, a bicornuate uterus was discovered with the fetus in the right horn. A viable female infant was delivered weighing 2430 g, with Apgar scores of 6 and 9 at 1 and 5 min, respectively. Meconium was present at delivery. The placenta was noted to have a marginal cord insertion. There was evidence of dark blood clots on the placenta—approximately 15%—consistent with placental abruption. Furthermore, a 4.5 cm × 4 cm well-circumscribed mass was seen at the edge of the placenta. Final placental pathology showed a 680 g large-for-gestational-age

To cite: Kim A, Economidis MA, Stohl HE. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-222399

placenta with congested vessels and blood clots but without infarcts, and placental mass consistent with chorioangioma.

The patient's postpartum course was uncomplicated and she was discharged home on postoperative day 3. She was noted to be doing well at her 6-week postpartum visit. The infant was discharged from the neonatal intensive unit after 1 month of management for prematurity. Neonatal echocardiogram showed a structurally normal heart. Genetics consultation demonstrated no evidence of a genetic syndrome or defect of metabolism. At 7 weeks of life, the infant was noted to be doing well in the paediatric clinic.

DISCUSSION

Placental chorioangioma has an incidence of 1%.³ Chorioangiomas greater than 4–5 cm increase the risk of polyhydramnios by increasing the intravascular pressure in the placenta and causing transudation into the amniotic fluid.^{3,6} Polyhydramnios is defined as AFI $\geq$ 24 cm or DVP $\geq$ 8 cm. Placental abruption (abruptio placentae) is defined as premature separation of the placenta, complicating 1% of births.⁷ It is most often a clinical diagnosis. While polyhydramnios is associated with an increased risk for placental abruption, there are little data on whether chorioangiomas or chorioangioma-related polyhydramnios increases the risk of placental abruption.⁸ We found one case report documenting a chorioangioma found at delivery of a stillborn at 37-week gestation, with clinical and pathological evidence of placental abruption.⁹ While this has been little studied, understanding the pathophysiology of the effect of a large chorioangioma on the maternal–fetal circulation helps support this hypothesis. A large placental mass can alter the fetal–maternal circulation by exerting mechanical pressure, causing separation, or abruption, of the placenta. Analogously, there is a case report that suggests that chorioangiomas are associated with separation of the chorioamniotic membrane, which can lead to premature rupture of membranes, preterm delivery and fetal distress.¹⁰

Our patient underwent two amnioreductions of average volume at a rate of approximately 100 mL/min for symptomatic relief of preterm contractions caused by polyhydramnios. Theoretically, a sudden change in the negative pressure as a result of large volume and/or fast-rate amnioreduction can result in separation of the placenta.¹¹ However, studies have shown no increased risk for placental abruption after amnioreduction, even after rapid vacuum drainage.¹² Rapid drainage is considered as removing up to 3.5 L in less than 30 min. Recently, a retrospective study by Kleine and colleagues (2016) was published that looked at the risk of pregnancy complications after amnioreduction in severe polyhydramnios compared with those with severe polyhydramnios without need for amnioreduction (ie, asymptomatic for dyspnoea or abdominal pain). They found that there were no placental abruptions within 48 hours of the amnioreduction and no difference in the risk of placental abruption even after the 48-hour period (amnioreduction 2.6% vs no amnioreduction 3.3%, OR 0.79, 95% CI 0.08 to 7.87).¹³

In the absence of placental or uterine abnormality, rapid or even large-volume amnioreductions for polyhydramnios do not seem to increase the risk of placental abruption. However, our case illustrates that in the setting of placental and uterine abnormality, a sudden change in the amniotic fluid volume may have detrimental effects. We believe that the second amnioreduction caused clinically significant disruption in the equilibrium set between the mechanical pressure created by the chorioangioma and the counterpressure exerted by the polyhydramnios. With the sudden increase in negative pressure from the second

amnioreduction, the amniotic fluid could not sufficiently counter the pressure exerted by the placental mass, which may have been further unstable due to the uterine anomaly, leading to premature separation of the placenta. Though there was less than 50% placental abruption, in combination with the placental tumour, this was enough to cause this detrimental shift in this case. The non-reassuring fetal status was indicative of a concealed, but clinically significant placental abruption necessitating prompt delivery.

In conclusion, limited data suggest that both chorioangioma and an amnioreduction in the setting of polyhydramnios each independently confer a theoretical risk of placental abruption. However, in combination, they may increase the risk for a clinically significant placental abruption. Furthermore, the uterine anomaly may have been further basis for unstable placenta implantation. Placental tumours may not always be detected antenatally due to technical limitations (ie, size of tumour, location of the tumour and depth of fluid). Therefore, in the case of idiopathic or chorioangioma-associated polyhydramnios, caution should be taken when performing large-volume or rapid amnioreductions, especially in very preterm pregnancies.

Learning points

- Polyhydramnios has many aetiologies, including the rare benign placental tumour called a chorioangioma.
- Antenatal amnioreduction is usually a safe way to remove amniotic fluid for symptomatic relief in a pregnancy complicated by severe polyhydramnios.
- Caution should be taken when performing large-volume amnioreduction(s) in the setting of idiopathic or chorioangioma-associated polyhydramnios, especially in very preterm pregnancies.

Contributors All authors are responsible for the following: (1) substantial contributions to the conception of this case as well as the acquisition, analysis or interpretation of data and literature for the work; (2) drafting the work or revising it critically for important intellectual content; (3) final approval of the version to be published and (4) agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Funding This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- 1 Wou K, Chen MF, Mallozzi A, et al. Pregnancy outcomes and ultrasonographic diagnosis in patients with histologically-proven placental chorioangioma. *Placenta* 2011;32:671–4.
- 2 Moore T, et al. Placenta and umbilical cord imaging. In: Creasy RK, Resnik R, Iams JD, . *Maternal-fetal medicine*. 7th edn. Philadelphia, PA: Elsevier Saunders, 2014:387–9.
- 3 Sepulveda W, Alcalde JL, Schnapp C, et al. Perinatal outcome after prenatal diagnosis of placental chorioangioma. *Obstet Gynecol* 2003;102:1028–33.
- 4 Zhang L, Cox RG, Graham J, et al. Association of maternal medical conditions and unfavorable birth outcomes: findings from the 1996–2003 Mississippi linked birth and death data. *Matern Child Health J* 2011;15:910–20.
- 5 Aviram A, Salzer L, Hirsch L, et al. Association of isolated polyhydramnios at or beyond 34 weeks of gestation and pregnancy outcome. *Obstet Gynecol* 2015;125:825–32.
- 6 Abdalla N, Bachanek M, Trojanowski S, et al. Placental tumor (chorioangioma) as a cause of polyhydramnios: a case report. *Int J Womens Health* 2014;6:955–9.

- 7 Oyelese Y, Ananth CV. Placental abruption. *Obstet Gynecol* 2006;108:1005–16.
- 8 Cunningham FG, Leveno KJ, Bloom SL, et al. Placental abnormalities. In: *Williams obstetrics*. 24th edn. New York (NY): McGraw-Hill Education, 2014:116–26.
- 9 Kohler HG, Iqbal N, Jenkins DM. Chorionic haemangiomas and abruptio placentae. Case report and review. *Br J Obstet Gynaecol* 1976;83:667–70.
- 10 Eom HM, Kim YN, Choi BH, et al. Chorioamniotic membrane separation caused by the seromucinous collection from a placental chorioangioma. *Obstet Gynecol Sci* 2016;59:233–7.
- 11 Pritchard JA, Mason R, Corley M, et al. Genesis of severe placental abruption. *Am J Obstet Gynecol* 1970;108:22–7.
- 12 Leung WC, Jouannic JM, Hyett J, et al. Procedure-related complications of rapid amniocentesis in the treatment of polyhydramnios. *Ultrasound Obstet Gynecol* 2004;23:154–8.
- 13 Kleine RT, Bernardes LS, Carvalho MA, et al. Pregnancy outcomes in severe polyhydramnios: no increase in risk in patients needing amnioreduction for maternal pain or respiratory distress. *J Matern Fetal Neonatal Med* 2016;29:4031–4.

Copyright 2018 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow