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CASE REPORT PEER REVIEWED | OPEN ACCESS

A case of a massive placental lake in the second trimester

Holly George, Amy Smith, John Tomlinson

ABSTRACT

We present a rare case of a massive placental lake, found on routine anomaly scan in the second trimester, in an otherwise low risk pregnancy. There is sparse literature on this subject and we propose the use of the term "Maternal Lake" for cases where there is a greater than 3 cm echolucent area with demonstrated blood flow in the retroplacental space. This case resulted in termination of pregnancy. We discuss the challenges of diagnosis and management in such rare cases.

Keywords: Fetal medicine, Obstetrics, Placental lake

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Holly George[1], Amy Smith[2], John Tomlinson[3]

Affiliations: [1]MBChb, ST4 Trainee Obstetrics and Gynaecology, Royal Bolton Hospital, Minerva Road, Farnworth, Bolton, BL4 0JR, United Kingdom; [2]MBChb, ST2 Trainee Obstetrics and Gynaecology, Royal Bolton Hospital, Minerva Road, Farnworth, Bolton, BL4 0JR, United Kingdom; [3]MBChb, FRCOG, Consultant Obstetrics and Gynaecology, Royal Bolton Hospital, Minerva Road, Farnworth, Bolton, BL4 0JR, United Kingdom.

Corresponding Author: Dr. Holly George, MBChb, ST4 Trainee Obstetrics and Gynaecology, Royal Bolton Hospital, Minerva Road, Farnworth, Bolton, BL4 0JR, United Kingdom; Email: hollyg13@doctors.org.uk

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INTRODUCTION

This is an interesting case report of a massive placental lake found on ultrasound imagining in the second trimester. This report reviews the challenges of diagnosis and management in such cases, along with the limited literature.

CASE REPORT

This is a case of a Gravida 4 Para 1 booked at 8 weeks gestation. She was low risk with a booking body mass index (BMI) of 21, history of uncomplicated asthma and family history of diabetes. She had a normal dating scan performed at 12+4 weeks gestation (Figure 1), with a normal combined aneuploidy screening result (PAPP-A 0.79 Corrected MoM and less than 1 in 5000 chance of trisomy 13, 18, or 21). In her previous substantive pregnancy her baby was on the 85th centile for birth weight.

The patient presented four days after her dating scan, with a threatened miscarriage. Ultrasound was performed which showed a viable intrauterine pregnancy with unremarkable placental appearance.

At the anomaly scan performed at 20+4 weeks gestation, the placenta was found to be posterior, abutting the cervical os with a large maternal lake (Figure 2). The placenta was attached at its margins with the body of placenta floating on top of the maternal lake (Figure 3). Normal uterine artery Doppler waveforms were obtained. The fetus was extremely growth restricted with all measurements less than the 3rd centile and estimated fetal weight of 157 g (3rd centile at 20 weeks gestation was 274 g).

As the fetal prognosis was extremely poor and there was concern regarding disruption of the marginal placental attachment with possible massive antepartum hemorrhage, the decision was taken to terminate the pregnancy. This was attempted medically however massive bleeding occurred and the baby was delivered by hysterotomy. Total blood loss was 2200 mL. There was no evidence of retroplacental clot at delivery and placental histology showed an eccentrically inserted cord. The placenta measured 80 mm in diameter and 20 mm thickness, the fetal surface was unremarkable. The maternal placental surface was disrupted by an area of

infarct equivalent to 10% of the surface area. There was no villitis. The male baby weighed 140 g at birth, which is significantly lower than the 3rd centile. The baby was euploid for chromosomes 13, 18, and 21 when assessed after delivery.

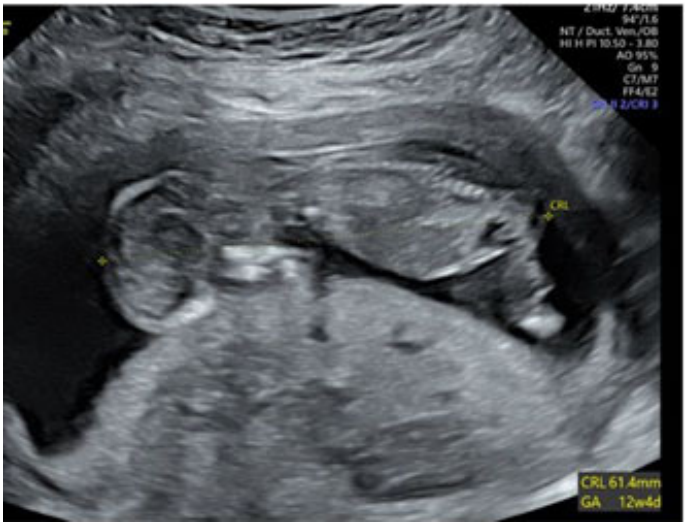

Figure 1: First trimester dating scan at 12+4 weeks gestations – Normal posterior placenta.

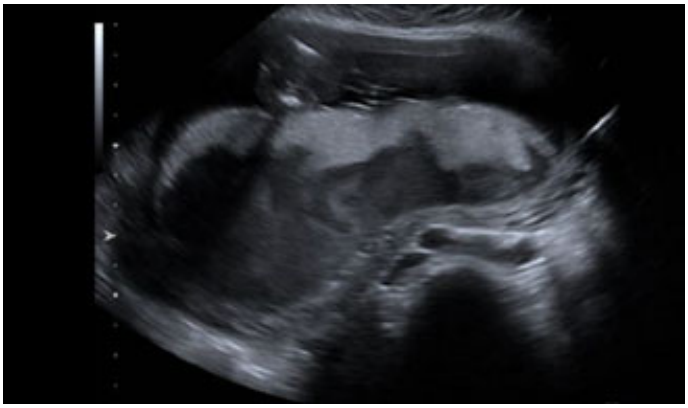

Figure 2: Anomaly scan. Showing large echo lucent area 11 × 9 cm.

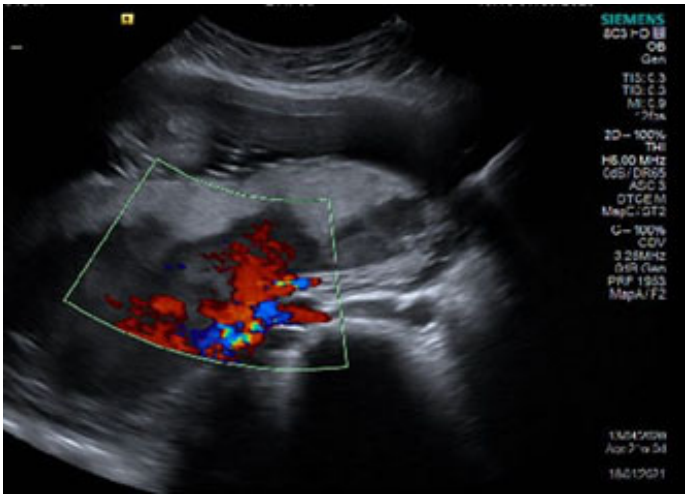

Figure 3: Turbulent flow of blood within large placental lake.

DISCUSSION

The authors have not found a similar case in the medical literature. The etiology of this case is unclear. At implantation there is interaction between the endometrium and the extra-embryonic membranes. Villous trophoblastic cells anchor the placenta to the endometrium and trophoblastic cells then leave the placenta to invade the maternal tissues to improve blood flow to the placenta. The basic placental structure (with spiral arteries supplying the placental bed and drained by venous sinuses) is established four weeks after implantation [1, 2]. The scan performed at 12 weeks revealed that the maternal lake had not yet developed at that stage. A few days later the patient presented with a bleed and the placenta morphology was noted to be normal. It is our postulation that there was damage to the placental anchoring mechanism at this event that then went on to develop into the massive maternal lake. As the placenta was not normally attached the delivery of oxygen and other nutrients to the placental villi would be impaired, hence the placental infarction observed and the severe fetal growth restriction.

There has not been any reports of such a large maternal lake previously. The nomenclature for variations of this appearance is diverse with terms including placental lakes, placental venous lakes, placental caverns, and placental lacunae [3]. The most common term used is placental lakes, which are defined as sonolucent spaces, where blood can be seen to be flowing within when colour flow Doppler is used. They can be singular or multiple and are often considered to be benign [4]; however can be associated with fetal growth restriction [5]. The prevalence of placental lakes has been reported as between 2.2% [6] and 17.8% [7] with associated findings of increased placental thickness, placenta accreta, and placental insufficiency. Classically swirling jets of fluid have been reported in some cases, with others revealing negative colour Doppler [7]. The closest we have found to a similar case is the report by Muramatsu et al. [7]; however, the size of the maternal lake is significantly larger in our case.

Jauniaux and Nicolaides [8] postulated that the etiology of maternal lakes was due to incomplete transformation of the spiral arteries resulting in focal overpressure, which caused disruption of the villous tissue resulting in feto-maternal hemorrhage. However, in our case there was no evidence of abnormal maternal uterine artery blood flow at 20 weeks, nor was there biochemical evidence of placental dysfunction with a normal PAPP-A at 12 weeks gestation.

The case presented is an extreme presentation with uncertain etiology, we hypothesize this started as a small area of placental disruption and extended to affect the whole placental attachment. There is a lack of clarity in the medical literature about the differentiation of physiological (placental lakes, with good outcome and affecting 1 or 2 placental cotyledons) and larger lesions (occasionally referred to as maternal lakes). We propose that the term maternal lake should be used if there is a >3 cm area in width affected (which is equivalent to more

than two placental cotyledons). Such patients should be followed closely for fetal growth restriction.

CONCLUSION

We conclude a rare case of placental lake in pregnancy with an unfortunate fatal outcome. The literature found is limited, and this case adds to the body of knowledge surrounding placental lakes their diagnosis, classification, and management.

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Author Contributions

Holly George – Design of the work, Acquisition of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree 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

Amy Smith – Design of the work, Acquisition of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree 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

John Tomlinson – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree 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

Guarantor of Submission

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Source of Support

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Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.