

## A case of circumvallate placenta causing preterm premature rupture of membranes post-amniocentesis

Kumari Pritti<sup>1</sup>, Vineet Mishra<sup>2</sup>, Rohina Aggarwal<sup>3</sup>, Sumesh Choudhary<sup>3</sup>

From <sup>1</sup>Associate Professor, <sup>2</sup>Professor and Head, <sup>3</sup>Professor Department of Obstetrics and Gynaecology, Institute of Kidney Diseases and Research Centre, Ahmedabad, Gujarat, India

### ABSTRACT

We report a case of circumvallate placenta which led to preterm premature rupture of membranes (PPROM) and leakage in a mother at 17 weeks of gestation. The mother underwent amniocentesis after the triple marker test showed an increased risk for trisomy 21. We encountered difficulty in aspirating amniotic fluid due to the abnormal placental structure, which was not known at the time of the invasive procedure. The mother experienced leaking 7 days post-procedure, followed by miscarriage. Autopsy examination revealed that the placenta was circumvallate, which not only caused difficulty in aspirating the amniotic fluid but also could be the cause of PPROM, a well-known complication of the circumvallate placenta. We emphasize that examining the placenta is very important to identify the cause of events in certain situations; circumvallate placenta or abnormal placenta can be suspected in cases where hindrance is encountered (not able to aspirate amniotic fluid even if the needle is visible in the amniotic sac) during amniocentesis.

**Key words:** Amniocentesis, Amniotic sac, Circumvallate placenta

Circumvallate placenta is a form of extrachorial placenta with a raised placental margin in an annular shape. Circumvallate placenta often causes persistent vaginal bleeding beginning in the first trimester, preterm premature rupture of membranes (PPROM), preterm delivery, and placental abruption, thus being associated with poor pregnancy outcomes [1]. The diagnosis is difficult during pregnancy; although ultrasound (USG)-based diagnoses of circumvallate placenta have been reported, it is often detected only by placental examination after delivery [2-5].

Herein, we report a case where post-amniocentesis at 17 weeks of gestation, the patient presented with complaints of leaking, which ultimately led to a miscarriage. On autopsy examination, the placenta was found to be a circumvallate placenta. Although at first instance, it would appear to be a complication of amniocentesis, the autopsy examination of the placenta revealed the pathology and also the cause of PPROM leading to miscarriage, thus emphasizing the importance of autopsy examination of the placenta in such cases.

### CASE REPORT

A 36-year-old female at 17 weeks of gestation with a singleton pregnancy was referred to our center for amniocentesis due to a high risk of trisomy 21 on the triple marker test. She was the second gravida with a 10-year-old healthy daughter. The previous pregnancy was uneventful. There was no history of miscarriage. There was no significant medical or family history.

The patient was on routine antenatal medicines and all the routine investigations were done which were within normal limits. The patient was counseled for the invasive procedure to confirm the results of maternal serum screening test which showed a high risk for trisomy 21.

Amniocentesis was performed under USG guidance with a 20 G, 15 cm amniocentesis needle with the needle guide attached to the probe. For the 1<sup>st</sup> time in our 10 years of experience of amniocentesis, we encountered a very strange phenomenon which was very difficult to explain during the procedure. When the needle entered the dark space (expected amniotic fluid, which appears black in color on USG) after piercing the abdominal wall and uterine wall, we tried to aspirate amniotic fluid but were unsuccessful. We attempted to enter the amniotic sac again,

| Access this article online   |  |
|--|--|
| Received - 31 July 2023<br>Initial Review - 21 August 2023<br>Accepted - 06 September 2023 | Quick Response code<br> |
| DOI: 10.32677/ijcr.v9i10.4188  |  |

**Correspondence to:** Kumari Pritti, Department of Obstetrics and Gynaecology, Institute of Kidney Diseases and Research Centre, Ahmedabad, Gujarat, India. E-mail: preeti.ikdrc@gmail.com

© 2023 Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC-ND 4.0).

thinking we had succeeded, but nothing could be aspirated. After the fourth attempt, we were finally able to obtain a sample.

On the 7<sup>th</sup> day after amniocentesis, the patient reported leaking, and she was diagnosed with PPRM. On the 9<sup>th</sup> day after amniocentesis, fetal cardiac activity was absent, leading to complete abortion. On local examination of the placenta, it showed a thickened and raised placental margin (Fig. 1). The chorionic plate, on the fetal side of the placenta, was smaller than the placental basal plate on the maternal side. The periphery was uncovered, and the fetal surface presented a central depression circumferentially surrounded by a thick, grey-white ring. The amniotic sac appeared to be evolving from the root of the umbilical cord. All the above findings confirmed the circumvallate placenta.

## DISCUSSION

This is the first case where we encountered difficulty in aspirating amniotic fluid. On retrospect, we can conclude that the dark space shown in USG (which we thought to be the amniotic sac filled with amniotic fluid) was actually a dead space between the fetal side of the placenta and the outer surface of the amniotic sac. Therefore, we could not aspirate the amniotic fluid. It was initially suspected that the leaking was a complication of amniocentesis. However, it is highly likely that the premature rupture of the membrane could be a consequence of the circumvallate placenta.

The circumvallate placenta group shows poor pregnancy and delivery outcomes. The circumvallate placenta may lead to vaginal bleeding during the second trimester, PPRM, and preterm delivery. A hematoma reportedly forms in the circumvallate placenta margin, causing ascending infection progressing to chorioamnionitis [1]. Women with circumvallate placenta frequently had clinical symptoms of vaginal bleeding during pregnancy and PPRM.

Several studies have reported that circumvallate placenta can be diagnosed based on ultrasonographic abnormalities in placental appearance [2-5]. McCarthy *et al.* [5] reported diagnostic criteria based on an irregular, uplifted placental edge (rounded placental

margin) or a marginal shelf or rim (thin or sheet-like placental edge). Suzuki [2] described the measurement of placental thickness (thickest part  $\geq 3.0$  cm) as being useful for circumvallate placenta screening. Harris *et al.* [3] found the accuracy of sonography for the diagnosis of complete circumvallate placenta to be 2% based on their criteria, concluding that it is difficult to diagnose this condition using sonography.

In the present case, circumvallate placenta could not be suspected; however, there was a strong suspicion of some structural abnormality causing hindrance in aspirating the amniotic fluid. Circumvallate placenta was not suggested by ultrasonographic findings alone.

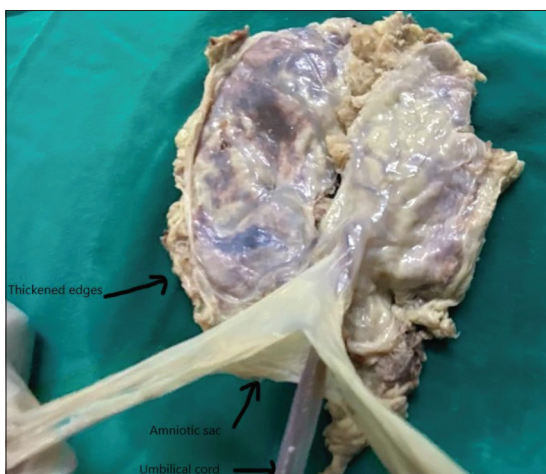
However, since the rupture occurred 7-day post-amniocentesis, we need to evaluate the procedure association as a cause for premature rupture. Factors that are associated with increased fetal loss rates include a transplacental approach, multiple needle insertions, larger needle calliper, an abnormal fetus, and potentially operator experience [6,7]. Complications due to amniocentesis have been reported in the first 48 h after the procedure. These include alterations in fetal heart rate, placental hemorrhage, placental abruption, uterine rupture, preterm labor, and rupture of membranes [8-10]. Since the leaking started 7-day post-procedure, it again indicates that rupture of the membrane could be due to circumvallate placenta rather than the amniocentesis procedure. A few studies have reported an increased risk of pregnancy loss with multiple attempts, the presence of blood-stained amniotic fluid, or fetal abnormalities. Ogilvie similarly concluded that operator-specific risks were found to be more appropriate, and women should be counseled to understand that miscarriage risk following an invasive procedure is very low and that any pregnancy loss is likely due to other pregnancy-related and maternal factors [11].

## CONCLUSION

We would like to emphasize the importance of post-delivery evaluation of the placenta to rule out any placental anomaly. It not only provides clues for the events that occurred but also aids in confirming the diagnosis. Once the diagnosis is confirmed, it becomes easier to counsel the parents and provide proper advice for subsequent pregnancies. In women where difficulty in aspirating amniotic fluid is encountered, even though the needle is presumed to be in the amniotic sac based on USG, the circumvallate placenta should be suspected and the clinical courses should be carefully monitored.

## AUTHORS' CONTRIBUTIONS

KP and VM conceived of the presented idea and wrote the manuscript. RA, SC, and KP performed the examination, evaluated the reports, and verified the analytical methods. VM encouraged KP to investigate and supervised the findings of this work. KP designed the figure. KP, VM, RA, and SC aided in interpreting the results and worked on the manuscript. All authors discussed the results and contributed to the writing of the manuscript.



**Figure 1:** Placenta showing thickened and raised placental margin. The periphery was uncovered; and circumferentially surrounded by a thick, grey-white ring. The amniotic sac appeared to be evolving from the root of the umbilical cord

## REFERENCES

1. Suzuki S. Clinical significance of pregnancies with circumvallate placenta. *J Obstet Gynaecol Res* 2008;34:51-4.
2. Suzuki S. Antenatal screening for circumvallate placenta. *J Med Ultrason* (2001) 2008;35:71-3.
3. Harris RD, Wells WA, Black WC, Chertoff JD, Poplack SP, Sargent SK, *et al.* Accuracy of prenatal sonography for detecting circumvallate placenta. *AJR Am J Roentgenol* 1997;168:1603-8.
4. Siström CL, Ferguson JE. Abnormal membranes in obstetrical ultrasound: Incidence and significance of amniotic sheets and circumvallate placenta. *Ultrasound Obstet Gynecol* 1993;3:249-55.
5. McCarthy J, Thurmond AS, Jones MK, Siström C, Scanlan RM, Jacobson SL, *et al.* Circumvallate placenta: Sonographic diagnosis. *J Ultrasound Med* 1995;14:21-6.
6. Tongsong T, Wanapirak C, Sirivatanapa P, Piyamongkol W, Sirichotiyakul S, Yamphochai A. Amniocentesis-related fetal loss: A cohort study. *Obstet Gynecol* 1998;92:64-7.
7. Akolekar R, Beta J, Picciarelli G, Ogilvie C, D'Antonio F. Procedure-related risk of miscarriage following amniocentesis and chorionic villus sampling: A systematic review and meta-analysis. *Ultrasound Obstet Gynecol* 2015;45:16-26.
8. Zalud I, Janas S. Risks of third-trimester amniocentesis. *J Reprod Med* 2008;53:45-8.
9. Galle PC, Meis PJ. Complications of amniocentesis: A review. *J Reprod Med* 1982;27:149-55.
10. Gordon MC, Narula K, O'Shaughnessy R, Barth WH Jr. Complications of third-trimester amniocentesis using continuous ultrasound guidance. *Obstet Gynecol* 2002;99:255-9.
11. Ogilvie C, Akolekar R. Pregnancy loss following amniocentesis or CVS sampling-time for a reassessment of risk. *J Clin Med* 2014;3: 741-6.

*Funding: Nil; Conflicts of interest: Nil.*

**How to cite this article:** Pritti K, Mishra V, Aggarwal R, Choudhary S. A case of circumvallate placenta causing preterm premature rupture of membranes post-amniocentesis. *Indian J Case Reports*. 2023;9(10):296-298.