DOI: 10.21088/ija.2320.0022.15326.6

Indian Journal of Anatomy
Volume 15, Number 3, September – December 2026

CASE REPORT

Occipital Encephalocele Diagnosed in Late-Third-Trimester Ultrasonography: A Case Report

Samar Choudhary[1], Alok Kumar[2], Nisha Yadav[3], Naveen Kumar M[4]

HOW TO CITE THIS ARTICLE:

Samar Choudhary, Alok Kumar, Nisha Yadav et al., Occipital Encephalocele Diagnosed in Late-Third-Trimester Ultrasonography: A Case Report. Ind Jr Anat. 2026; 15(3): 128-132.

ABSTRACT

Introduction: Encephalocele is a congenital cranial defect through which meninges, cerebrospinal fluid, and sometimes neural tissue herniate. Prenatal diagnosis permits further assessment and multidisciplinary counselling.

Case Report: A 30-year-old pregnant woman underwent ultrasonography at approximately 36 weeks and 3 days of gestation. A live singleton fetus was identified in cephalic presentation, with a fetal heart rate of 136 beats per minute. An occipital calvarial defect with an extracranial sac containing echogenic neural tissue and apparent continuity with the intracranial contents was demonstrated, consistent with an occipital meningoencephalocele. The lateral ventricular atrium measured 14.77 mm, consistent with ventriculomegaly. The estimated fetal weight was 2521 g.

Conclusion: Careful assessment of the fetal skull and intracranial structures is essential for recognising encephalocele and associated abnormalities. Further neurosonography, consideration of fetal magnetic resonance imaging, genetic counselling, and multidisciplinary planning are appropriate after prenatal diagnosis.

KEYWORDS

• Encephalocele • Occipital Encephalocele • Meningoencephalocele • Prenatal Ultrasonography

AUTHOR'S AFFILIATION:

[1] Junior Resident, Department of Anatomy, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India.

[2] Junior Resident, Department of Anatomy, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India.

[3] Associate Professor, Department of Anatomy, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India.

[4] Junior Resident, Department of Anatomy, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India.

CORRESPONDING AUTHOR:

Nisha Yadav, Associate Professor, Department of Anatomy, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India.

E-mail: dr.nishayadav@gmail.com

➢ **Received:** 02-09-2026 ➢ **Accepted:** 04-10-2026

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution NonCommercial 4.0 License (http://www.creativecommons.org/licenses/by-nc/4.0/) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the Red Flower Publication and Open Access pages (https://www.rfppl.co.in)

Key Messages: Occipital meningoencephalocele with associated ventriculomegaly was diagnosed at 36 weeks and 3 days. The case highlights the importance of systematic assessment of the fetal calvarium and intracranial anatomy during routine ultrasonography.

INTRODUCTION

Encephalocele is a congenital cranial malformation in which meninges, cerebrospinal fluid, and occasionally neural tissue herniate through a calvarial defect. A lesion containing meninges and cerebrospinal fluid alone is termed a meningocele, whereas one containing neural tissue is termed a meningoencephalocele. Occipital encephalocele has a variable prognosis depending on the defect, herniated contents, associated intracranial abnormalities, and extracranial anomalies.[1,2] Prenatal ultrasonography is important for identifying the calvarial defect and associated extracranial mass. We report an occipital encephalocele detected during late-third-trimester ultrasonography with associated ventriculomegaly.

CASE REPORT

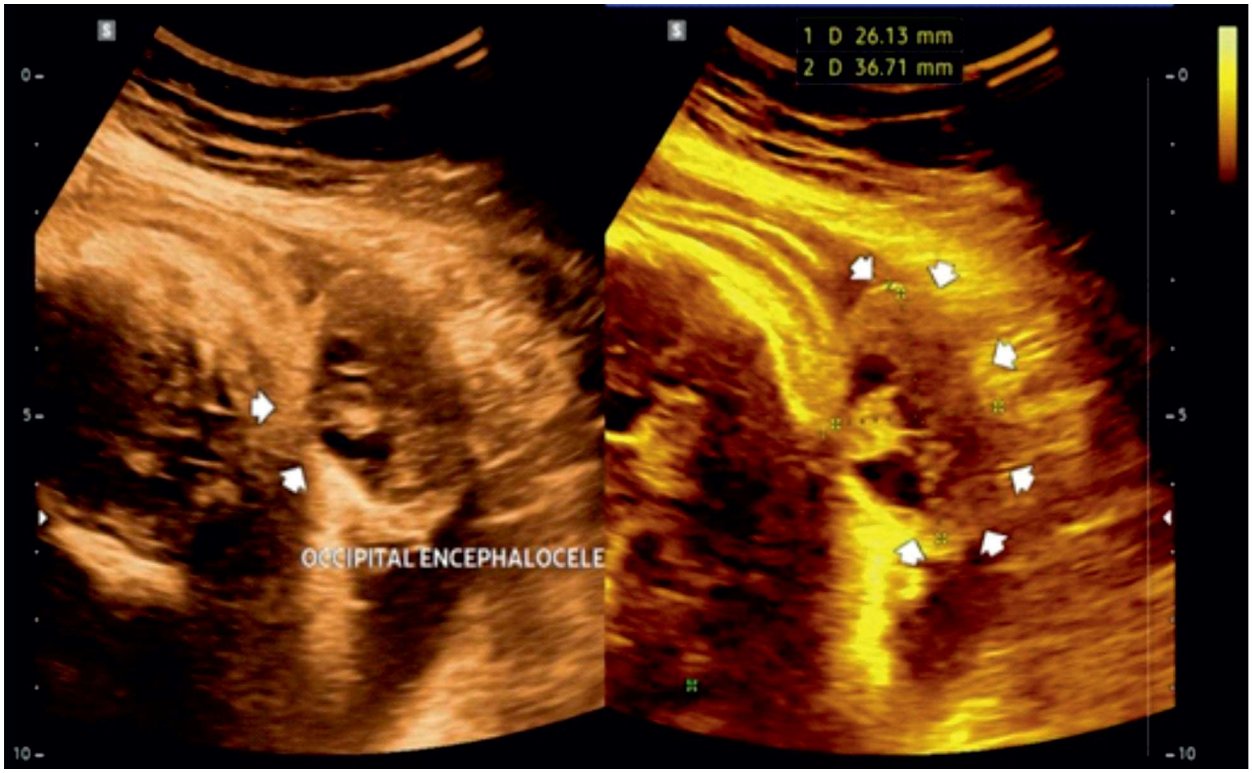


Figure 1: Prenatal ultrasonographic images demonstrating the midline occipital calvarial defect and extracranial herniation. White arrows indicate the margins of the calvarial defect and the extracranial sac containing echogenic tissue. The apparent continuity of the extracranial tissue with the intracranial contents supports the diagnosis of occipital meningoencephalocele.

A 30-year-old pregnant woman underwent antenatal ultrasonography at a tertiary care centre in Etawah, Uttar Pradesh, India. The examination was performed at approximately 36 weeks and three days of gestation according to the last menstrual period. The patient had not undergone second-trimester detailed fetal ultrasonography, and earlier scans performed elsewhere did not reveal any fetal structural anomalies. The patient's name, hospital registration number, spouse's name, exact examination date, facility-specific identifiers, and other direct identifiers have been omitted.

Ultrasonography demonstrated a live singleton fetus in cephalic presentation. The fetal heart rate was 136 beats per minute. Fetal

biometric assessment showed a biparietal diameter of 80.32 mm, head circumference of 308.07mm, abdominal circumference of 298.51mm, and femur length of 73.76mm. The estimated fetal weight was 2521g. The composite ultrasound age was approximately 34 weeks and four days. Gestational age was based on the last menstrual period, as no first-trimester dating scan was available.

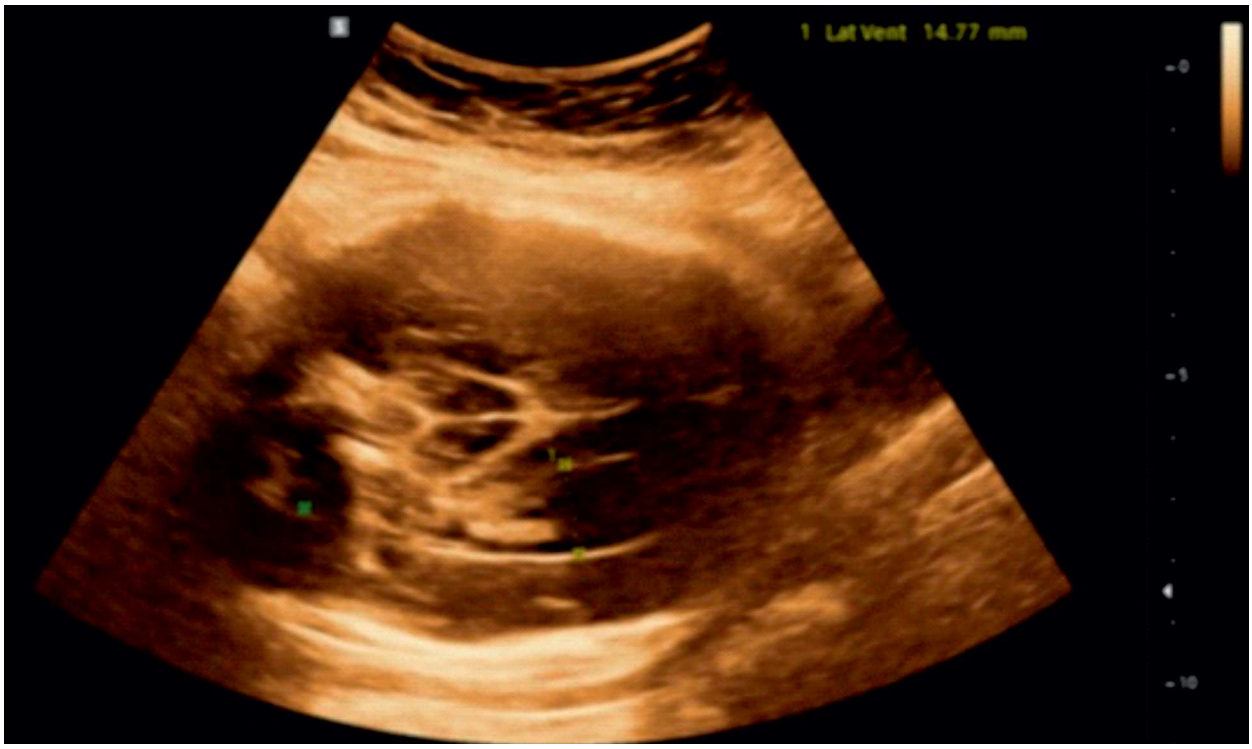


Figure 2: Prenatal ultrasonographic measurement of the lateral ventricular atrium, measuring 14.77 mm, consistent with ventriculomegaly



Figure 3: Postnatal photograph demonstrating the lesion.

Examination of the fetal cranial anatomy demonstrated a defect involving the occipital region of the calvarium. An associated extracranial lesion was identified, measuring approximately 26.13×36.71 mm, with herniation of echogenic tissue and apparent continuity with the intracranial contents, consistent with an occipital meningoencephalocele.

The lateral ventricular atrium measured 14.77 mm, consistent with ventriculomegaly.

The report did not document a complete assessment of the corpus callosum, cerebellum, posterior fossa, facial profile, or other fetal organ systems.

Based on the sonographic findings, a prenatal diagnosis of occipital meningoencephalocele with associated ventriculomegaly was made. The fetus was delivered by caesarean section on the same day. Postnatal examination demonstrated an occipital encephalocele, corresponding to the prenatal sonographic findings (Figure 3).

Privacy Protection

All direct patient identifiers have been removed.

DISCUSSION

Encephalocele results from abnormal development of the cranial vault and neural tube, leading to herniation of intracranial contents through a calvarial defect. The herniated sac may contain cerebrospinal fluid and meninges alone or may include neural tissue.[1,2]

The aetiology of encephalocele is multifactorial. Genetic susceptibility, inadequate periconceptional folate, pregestational diabetes, maternal obesity, hyperthermia during early pregnancy, and exposure to certain teratogenic medications have been proposed as possible risk factors. Consanguinous marriage has also been reported in a proportion of affected families.[3,4] This association may be related to an increased probability of autosomal-recessive disorders or syndromic conditions; however, the strength of the association varies between populations, and consanguinity alone does not establish causation.

The principal sonographic feature of an encephalocele is a calvarial defect with an extracranial cystic, solid, or mixed mass. The sonographic appearance varies according to the contents of the herniated sac.

In the present case, ultrasonography demonstrated a midline occipital calvarial defect with an extracranial sac measuring approximately 26.13 × 36.71 mm. Echogenic neural tissue was identified within the sac, with apparent continuity with the intracranial contents, supporting the diagnosis of an occipital meningoencephalocele. In the present case, the abnormality had not been detected on previous antenatal ultrasonographic examinations performed at other centres, and a formal second-trimester anomaly scan had not been performed. The lesion was subsequently identified at 36 weeks and 3 days during assessment of the fetal cranial anatomy. This highlights the importance of systematic evaluation of the fetal calvarium and intracranial structures during routine fetal anomaly ultrasonography.

Routine second-trimester fetal anomaly ultrasonography is important for detecting cranial malformations. When a central nervous system abnormality is suspected, targeted fetal neurosonography should be performed to assess the ventricular system, corpus callosum, vermis, cortical development, posterior fossa, and communication between the intracranial and extracranial components.[9,10] Fetal magnetic resonance imaging may provide additional information when ultrasonographic findings are incomplete or difficult to characterise.[3,11]

Prognostic significance of occipital encephalocele depends on severity, progression, size, the volume of herniated neural tissue, hydrocephalus, microcephaly, posterior-fossa abnormalities, and the presence of other structural or genetic abnormalities. Encephalocele may occur as an isolated defect or as part of syndromes such as Meckel–Gruber syndrome.[2,5-7]

Periconceptional folic acid supplementation, preconception counselling, optimisation of maternal diabetes, review of potentially teratogenic medication, and prevention of maternal hyperthermia are important neural tube defect prevention strategies.[8] These measures reduce risk but cannot prevent every case.

Prevention of encephalocele is not absolute because the condition is genetically and environmentally heterogeneous. Periconceptional folic acid supplementation

and optimisation of maternal medical conditions are established strategies for reducing the risk of neural tube defects. Review of potentially teratogenic medications and appropriate genetic counselling may also be relevant depending on maternal and familial risk factors. These measures reduce risk but cannot guarantee prevention.

CONCLUSION

Late-third-trimester ultrasonography demonstrated an approximately 26.13 × 36.71 mm occipital meningoencephalocele associated with ventriculomegaly, with the lateral ventricular atrium measuring 14.77 mm.

This case demonstrates that an occipital meningoencephalocele may be recognised even in late-third-trimester ultrasonography, including after the abnormality has not been detected on previous antenatal examinations. Identification of the calvarial defect, extracranial neural tissue, and associated ventriculomegaly is important for diagnosis and prognostic assessment. Targeted neurosonography and, when indicated, fetal MRI can further characterise the lesion and associated intracranial abnormalities and facilitate multidisciplinary perinatal counselling.

Acknowledgement

We would like to express our sincere gratitude to all those who contributed to the successful completion of this case report.

Conflict of Interest: No conflict of interest.

Source of Funding: No external funding was received.

Informed Consent: Written informed consent was taken.

REFERENCES

1. Markovic I, Bosnjakovic P, Milenkovic Z. Occipital encephalocele: cause, incidence, neuroimaging and surgical management. Curr Pediatr Rev. 2020;16(3):200–205. doi:10.2174/1573396315666191018161535.
2. Dąbkowska S, Kucińska-Chahwan A, Beneturska A, Ilnicka A, Nowakowska B, Panek G, et al. Prenatal diagnosis and clinical significance of cephalocele—a single institution experience and literature review. Prenat Diagn. 2020;40(5):612–617. doi:10.1002/pd.5654.
3. Sepulveda W, Wong AE, Andreeva E, Odegova N, Martinez-Ten P, Meagher S. Sonographic spectrum of first-trimester fetal cephalocele: review of 35 cases. Ultrasound Obstet Gynecol. 2015;45(6):669–675. doi:10.1002/uog.14661.
4. Gaulden AL, Nagaraj UD, Emmert AS, Vuong SM, Kline-Fath BM, Bierbrauer KS, et al. Imaging-based prediction parameters of perinatal morbidity and mortality for fetal occipital cephaloceles. Prenat Diagn. 2024;44(11):1327–1334. doi:10.1002/pd.6660.
5. Kanjilal S, Verma PK, Rai S, Kumar A, Bhaisora KS, Maurya VP, et al. Occipital encephalocele: a retrospective analysis and assessment of post-surgical neurodevelopmental outcome. Childs Nerv Syst. 2024;40(12):3945–3952. doi:10.1007/s00381-024-06506-5.
6. Hussen E, Gebremedhin FW. Giant occipital encephalocele: a case report and literature review. Int Med Case Rep J. 2023;16:529–535. doi:10.2147/IMCRJ.S433167.
7. Gadgil N, McClugage SG, Aldave G, et al. Natural history of posterior fetal cephaloceles and incidence of progressive cephalocele herniation. J Neurosurg Pediatr. 2022;30(3):342–348. doi:10.3171/2022.6.PEDS22102.
8. Fedoua W, Zineb S, Sanna B, Mohammed J, Amine L, Said B. Occipital encephalocele: Presentation of case. Int J Surg Case Rep. 2023 Sep;110:108642. doi: 10.1016/j.ijscr.2023.108642. Epub 2023 Aug 9. PMID: 37651806; PMCID: PMC10509805.
9. Malinger G, Paladini D, Timor-Tritsch IE, Monteagudo A, Pilu G, Salomon LJ, et al. ISUOG Practice Guidelines (updated): sonographic examination of the fetal central nervous system. Part 1: performance of screening examination and indications for targeted neurosonography. *Ultrasound Obstet Gynecol*. 2020;56(3):476–484. doi:10.1002/uog.22145.
10. Paladini D, Malinger G, Birnbaum R, Monteagudo A, Pilu G, Salomon LJ, Timor-Tritsch IE. ISUOG Practice Guidelines (updated): sonographic examination of the fetal central nervous system. Part 2: performance of targeted neurosonography. *Ultrasound Obstet Gynecol*. 2021;57(4):661–671. doi:10.1002/uog.23616
11. Sefidbakht S, Iranpour P, Keshavarz P, Bijan B, Haseli S. Fetal MRI in prenatal diagnosis of encephalocele. J Obstet Gynaecol Can. 2020;42(3):304–307. doi:10.1016/j.jogc.2019.03.013.