International Journal of Contemporary Pediatrics
Pradhan M et al. Int J Contemp Pediatr. 2025 Aug;12(8):1446-1449
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20252232

Case Report

Alobar holoprosencephaly and cebocephaly in neonate: a case report

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Received: 21 May 2025
Revised: 17 June 2025
Accepted: 02 July 2025

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ABSTRACT

Holoprosencephaly is a rare congenital malformation characterized by the failure of the forebrain to divide into two hemispheres. Cebocephaly is a form of craniofacial abnormality associated with holoprosencephaly, marked by hypotelorism (closely spaced eyes) and a malformed nose-often small, flattened, or presenting as a single imperforate nostril. This case highlights the diagnostic challenges and clinical outcomes associated with severe holoprosencephaly accompanied by cebocephaly in a preterm neonate. We report a case of alobar holoprosencephaly diagnosed via obstetric ultrasound in the third trimester. The neonate was born prematurely and presented with polyhydramnios and multiple congenital anomalies. On examination, the infant had microcephaly, hypotelorism, anophthalmia, and a small nose with a single imperforate nostril. Based on clinical and radiographic findings, the diagnosis of alobar holoprosencephaly with cebocephaly was confirmed. The parents were counselled extensively regarding the presence of multiple congenital anomalies, likely hypoxic-ischemic encephalopathy, and the poor prognosis for survival and quality of life. After a multidisciplinary discussion involving the medical team and the family, palliative care was initiated. The neonate passed away one hour after birth. This case underscores the importance of prenatal diagnosis, multidisciplinary management, and compassionate parental counselling in cases involving severe congenital anomalies such as holoprosencephaly and cebocephaly.

Keywords: Holoprosencephaly, Cebocephaly, Congenital malformations, Prenatal screening

INTRODUCTION

Holoprosencephaly (HPE) is a congenital brain malformation resulting from the incomplete division of the forebrain into two separate hemispheres. Abnormal development of the central nervous system is often accompanied by midline defects of the face and forebrain structures.[1] HPE presents a wide spectrum of neurological and craniofacial abnormalities, ranging from mild facial dysmorphism to severe cognitive and physical impairments. The most severe form, alobar HPE, is typically incompatible with life. Clinical manifestations include facial anomalies such as hypotelorism, microcephaly, and a blind-ended or single nostril.[2] Cebocephaly is a rare congenital craniofacial anomaly characterized by hypotelorism and a malformed nose, often small, flattened, or presenting as a single, imperforate nostril.[3] Understanding the clinical spectrum of HPE and its associated anomalies is essential for healthcare professionals in improving antenatal diagnosis, counseling, and management strategies.[4] Here, we present a case of alobar holoprosencephaly with cebocephaly, aiming to highlight the importance of early prenatal detection and multidisciplinary counseling.

CASE REPORT

We reported the case of an 860-gram male neonate born via spontaneous vaginal delivery at 28+5 weeks of gestation. The mother, a third gravida with two previous

healthy children, presented to the emergency department in active labor approximately four hours prior to delivery. An antenatal ultrasound performed on the day of admission revealed findings suggestive of holoprosencephaly and polyhydramnios. No prior antenatal ultrasound or fetal MRI had been conducted during the pregnancy.

At birth, the neonate did not cry and required immediate resuscitation. APGAR scores at 1 and 5 minutes were both 2. Umbilical artery blood gas analysis indicated severe metabolic acidosis, with a pH of 6.9, PCO_2 of 30 mmHg, HCO_3^- of 10 mmol/l, base excess of –16, and lactate level of 7 mmol/l.

Physical examination revealed multiple craniofacial anomalies, including microcephaly, hypotelorism, anophthalmia, and a small, malformed nose with a single imperforate nostril (Figure 1, 2).

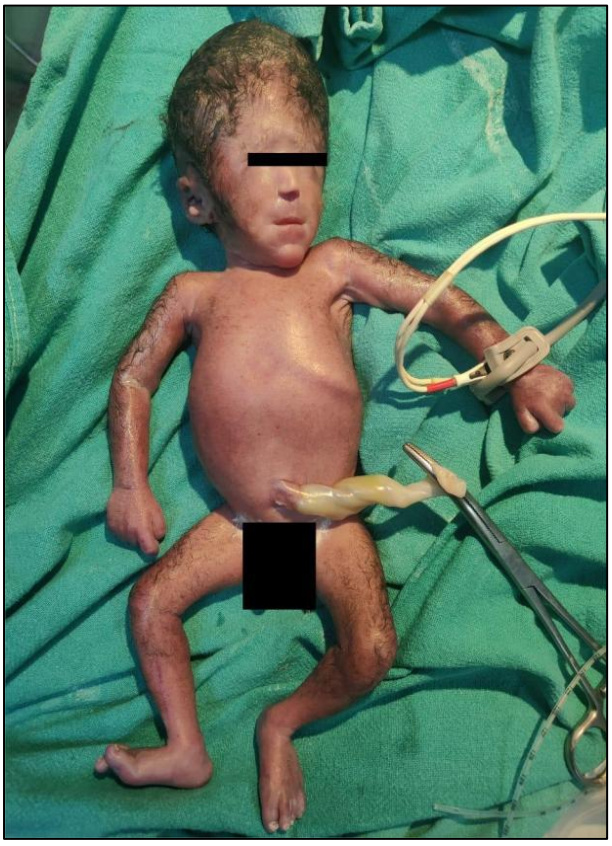

Figure 1: Baby's face and head dysmorphism.

A cranial ultrasound performed in the delivery room revealed an alobar brain structure with a single fluid-filled ventricle and absence of the interhemispheric fissure or septum, confirming the diagnosis of alobar holoprosencephaly (Figure 3). Based on clinical and radiographic findings, the neonate was diagnosed with alobar holoprosencephaly associated with cebocephaly. The parents were counseled extensively regarding the multiple congenital anomalies, including severe hypoxic-ischemic encephalopathy, and the extremely poor prognosis for survival and quality of life.

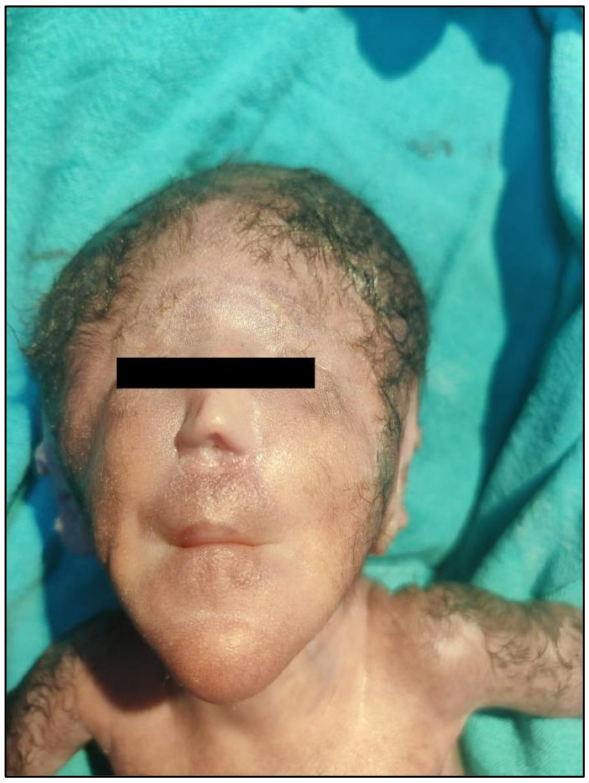

Figure 2: Face showing anophthalmous, hypotelorism, single nasal cavity with imperforate nostril.

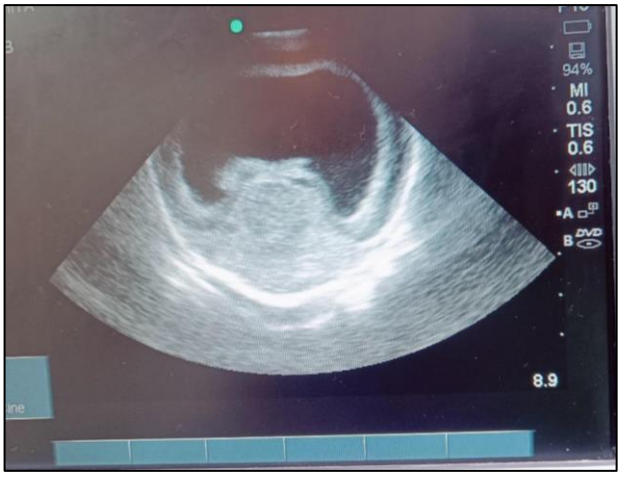

Figure 3: USG cranium (coronal view) of baby showing fluid filled single cavity without any brain parenchyma suggestive of alobar holoprosencephaly.

Following a multidisciplinary discussion involving the medical team and family, a decision was made to initiate palliative care. Supportive measures included thermoregulation under a radiant warmer in servo mode, oxygen support via nasal prongs, minimal handling, and encouragement of parental involvement. The infant passed away at one hour of life. The parents declined

consent for post-mortem examination and genetic testing, limiting further etiological evaluation. In this clinical context, differential diagnoses considered included septo-optic dysplasia, DiGeorge syndrome, hydranencephaly, porencephalic cyst, and arachnoid cyst. However, the combination of clinical features and imaging findings was most consistent with alobar holoprosencephaly.

DISCUSSION

Holoprosencephaly (HPE) is a severe congenital anomaly caused by the failure of the prosencephalon to divide properly between days 18 and 28 of embryonic development, leading to abnormalities in both brain and facial structures. It is estimated to occur in 1/16,000 live births and 1/250 conceptuses.[1] The severity of the clinical phenotype is broad and usually mirrors the radiologic and associated facial features.[5] It is the translation of a defect of ventral induction of the prosencephalon at the level of the mesodermal prechordal plate after, during, but also before, the closure of the neural tube.

Based on how distinctly the cerebral hemispheres develop, Demyer and Zeman classified HPE into three types: alobar, semi-lobar, and lobar. The first two forms have a very poor prognosis, thus justifying early medical termination of the pregnancy.[6] HPE has a diverse range of causes, though it frequently arises sporadically. Chromosomal anomalies are detected in 25–50% of cases, predominantly trisomy 13 (75%), followed by triploidy (20%) and trisomy 18 (1–2%). Single-gene disorders have also been reported. HPE may result from teratogenic exposure, such as poorly controlled blood glucose levels in maternal diabetes.[7]

HPE probably results from a combination of genetic mutations and environmental influences during the initial weeks of pregnancy. While some individuals with HPE may not survive the neonatal period, others may live but often present with varying degrees of developmental delay.[8] Severe craniofacial anomalies linked to HPE include conditions such as cyclopia, synophthalmic, cebocephaly, and the presence of a proboscis. Milder features can include a small head (microcephaly), closely spaced eyes (hypotelorism), a flat nasal bridge, a single central incisor, and midline facial clefts.[7]

Several characteristic midline facial malformations are associated with holoprosencephaly, including hypotelorism.[9] Our case had microcephaly, anophthalmus, hypotelorism, and a single nostril. These complex malformations probably led to severe hypoxic ischemic encephalopathy and the baby died at one hour of life. Uttara et al reported a similar case of a 28-year-old primigravida who came for medical termination at 25 weeks of gestation and delivered a 600-gram dead female fetus with cyclopia, fetal proboscis, and neurocutaneous marker.

High-resolution prenatal imaging plays a critical role in diagnosing HPE and providing prenatal counseling, though milder brain abnormalities may be challenging to detect before birth.[8] Poenaru et al. reported a similar case of a preterm male infant born at 32 weeks gestational age by a 26-year-old mother. The birth weight was 1800 grams. The infant died immediately after birth. The pregnancy, which was partially investigated, had an uncomplicated course. The mother had a previous cesarean section in 2002, and her first child had normal neurologic development until now. At 29 weeks of gestation, alobar holoprosencephaly was diagnosed by a brain scan.

The sonography showed: fused cerebral hemispheres in their anterior and middle regions, major dilatation of the cerebral ventricles, proboscis, microcephaly, bilateral microphthalmia, and hypotelorism; the orbits were situated between the mouth and the proboscis. At birth, the infant presented with: cyclopia, proboscis, and macroglossia.

The autopsy showed, besides the facial malformations, fused cerebral hemispheres, a single ventricle, and fused thalamic nuclei in their caudal portion and suprarenal glands agenesis.[11] Our case involved an unbooked pregnancy with only a single antenatal visit during the first trimester. At this visit, a nuchal translucency (NT) measurement of 2.7 mm was recorded. However, no follow-up anomaly scan or additional diagnostic tests were performed. The mother did not take folic acid supplementation during the first trimester. At 28 weeks and 5 days of gestation, the mother presented to the labor room in active preterm labor.

A late antenatal ultrasound revealed severe brain malformations consistent with alobar holoprosencephaly. Molecular diagnosis can be made by gene sequencing and allele quantification. Clinically, prenatal detection of HPE primarily relies on ultrasound and MRI, as molecular testing is not commonly employed during routine screening. Treatment is symptomatic and supportive and requires multidisciplinary management. Child outcome depends on the HPE severity and the medical and neurological complications associated. Severely affected children have a very poor prognosis. Mildly affected children may exhibit few symptoms and may live a normal life.[1]

CONCLUSION

Alobar holoprosencephaly and cebocephaly presents significant challenges in prenatal care, neonatal resuscitation, and ethical decision-making. As the condition is incompatible with life, early detection via ultrasonography and fetal MRI is vital for appropriate management and counselling of the parents. The case emphasizes the need for comprehensive antenatal screening, including early diagnostic testing and anomaly

scans. Palliative care plays important role in such cases where survival with quality of life is unlikely.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Dubourg C, Bendavid C, Pasquier L, Henry C, Odent S, David V. Holoprosencephaly. Orphanet J Rare Dis. 2007;2:8.
2. Ariyo IJ, Mchaile DN, Magwizi M, Kayuza M, Mrindoko P, Chussi DC. Alobar holoprosencephaly with cebocephaly in a neonate: A rare case report from Northern Tanzania. Int J Surg Case Rep. 2022;93:106960.
3. Lin CH, Tsai JD, Ho YJ, Lin WC. Alobar holoprosencephaly associated with cebocephaly and craniosynostosis. Acta Neurol Taiwan. 2009;18(2):123-6.
4. Ramakrishnan S, Das JM. Holoprosencephaly. In: StatPearls. Treasure Island (FL): StatPearls Publishing. 2024. Available at: http://www.ncbi.nlm.nih.gov. Accessed on 21 January 2025.
5. Malta M, AlMutiri R, Martin CS, Srour M. Holoprosencephaly: review of embryology, clinical phenotypes, etiology and management. Children (Basel). 2023;10(4):647.
6. Fedoua W, Mouna H, Hasana S, Boufettal H, Mahdaoui S, Samouh N. Holoprosencephaly (HPE): case report and review of the literature. Int J Surg Case Rep. 2023;110:108723.
7. Monteagudo A. Holoprosencephaly. Am J Obstet Gynecol. 2020;223(6):13–6.
8. Scelsa B, Gano D, Hart AR, Vollmer B, Lemmon ME, Tarui T, et al. Prenatally diagnosed holoprosencephaly: review of the literature and practical recommendations for pediatric neurologists. Pediatr Neurol. 2025;162:87-96.
9. Sawhney S, Machado L, Jain R. Prenatal MRI image of a fetus with semilobar holoprosencephaly. Sultan Qaboos Univ Med J. 2008;8(1):93-4.
10. Gautam U, Shrestha S, Phuyal R. Cyclopia: A Rare Congenital Anomaly. Available at: http://jkahs.org.np/jkahs/index. Accessed on 21 February 2025.
11.Poenaru MO, Vilcea ID, Marin A. Holoprosencephaly: two case reports. Maedica. 2012;7(1):58-62.

Cite this article as: Pradhan M, Shinde SG, Kar S, Som T. Alobar holoprosencephaly and cebocephaly in neonate: a case report. Int J Contemp Pediatr 2025;12:1446-9.