Case Report

Otocephaly revealed: A case study of a rare facial anomaly

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ABSTRACT

Otocephaly (OC) is a rare malformation characterized by the association of agnathia (agenesis of mandible) or mandibular hypoplasia, melotia (anteromedial malposition of ears), microstomia (small mouth), aglossia or microglossia (absent or rudimentary tongue). We present an extremely preterm/very low birth weight/female baby born to a G2P1IUD1 mother. The baby did not cry at birth. APGAR was 3 at 1 min and 1 at 5 min. On examination, the baby had multiple craniofacial abnormalities including an absent mandible, small mouth, rudimentary tongue, ventromedian malposition of ears, and bilateral choanal atresia. Mother had gestational diabetes mellitus and severe polyhydramnios. No similar history in the family. Within 30 s of life, the baby became cyanotic. Bagging with mask and intubation was tried but resuscitation was not successful due to upper airway malformation. The baby had bradycardia and expired at 20 min of life.

Key words: Agnatho-otocephaly complex, Ex-utero intrapartum treatment, Otocephaly

Otocephaly (OC) is an extremely rare congenital disorder, occurring in <1 in 70,000 births. Despite its rarity, around 65 cases have been documented over the past three decades [1]. This condition is characterized by distinct facial abnormalities, including absence or hypoplasia of the mandible (agnathia), ventromedial malposition of the ears with or without auricular fusion (synotia), and microstomia with hypoplasia or absence of the tongue (aglossia). These anomalies arise between 4 and 7 weeks of gestation, during a critical period of facial development, specifically affecting structures derived from the first pharyngeal arch [1]. This syndrome is thought to result from a defect in blastogenesis or impaired neural crest cell migration, leading to alterations in midline development [2]. OC etiology is not clear; however, it has been related to genetic and teratogenic factors, such as mutations in the PRRX1 gene or unbalanced translocations [3]. There have been occasional reports of familial aggregation, suggesting a possible genetic component [2]. OC can show extracranial malformations (mainly holoprosencephaly). The severity of OC signs may vary from mandibular hypoplasia to situs inversus and holoprosencephaly [1]. Diagnosing OC prenatally can be difficult, but it's often suspected when seen alongside other abnormalities, such as polyhydramnios, holoprosencephaly, or situs inversus. Polyhydramnios is the most frequent early sign, but most cases are diagnosed later in pregnancy, typically beyond 24 weeks [2]. When OC is suspected, facial defects should be carefully investigated, and 3D ultrasound has been shown to be more sensitive than 2D ultrasound for this diagnosis [3,4].

OC is an extremely rare congenital anomaly making this case reports a valuable contribution to the limited existing literature. This report highlights the importance of diagnosis, genetic counseling, and multidisciplinary management of such complex cases.

CASE REPORT

Extreme preterm (30 weeks)/very low birth weight (1.12 kg)/female baby, born out of non-consanguineous marriage to G2P1IUD1 mother by vaginal delivery was antenatally diagnosed to have gestational diabetes mellitus and severe polyhydramnios. Anomaly scan was not done. The patient was referred to us for delivery.

The baby did not cry after birth and the APGAR scores were 3 and 1 at 1 min and 5 min, respectively. The baby was pink and had multiple craniofacial anomalies. Within 30 s, the baby was cyanotic (Fig. 1). Bagging with a mask and intubation was tried. As there was upper airway malformation, resuscitation was not successful. Bradycardia worsened and the baby expired in 20 min of life.

DISCUSSION

We describe a case of OC in a female child. Kandala and Nalluri [5] suggested in their case report that failed migration

Access this article online	
Received - 21 September 2024 Initial Review - 05 October 2024 Accepted - 23 November 2024	Quick Response code
DOI: ***	

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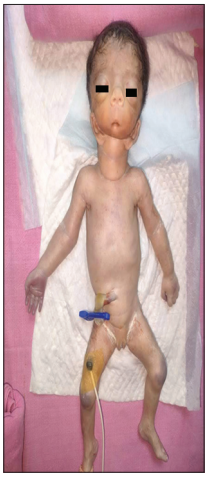

Figure 1: Clinical picture of the baby

of neural crest cells from the hindbrain, is crucial for the development of the first pharyngeal arch's maxillary and mandibular prominences which leads to OC. Vanhees *et al*. [6] in a case report suggested that OC-agnathia, astomia, and synotia can be prenatally diagnosed by 3D/4D ultrasound and tomographic ultrasound image. Fabiani *et al*. revealed that the origin of OC has been linked to both genetic and teratogenic causes. Factors such as salicylates, theophylline, radiation, and alcohol exposure during pregnancy have been reported as potential causes [7]. Faye-Petersen *et al*. [2] Through a case series of 5 OC cases concluded that a commonly associated condition in OC is holoprosencephaly, although skeletal, genitourinary, cardiovascular anomalies and situs inversus have also been reported. Golinko *et al*. revealed that long-term survival is nearly impossible due to the poor prognosis associated with the agnathia OC complex [8].

Although Agnatho-OC complex (AOC) is typically lethal, recent studies suggest that isolated agnathia may have a more favorable prognosis, particularly with timely and effective airway management. Notably, Alexander *et al*. reported a series of 9 patients with isolated agnathia who achieved remarkable survival outcomes, ranging from 10 months to 27 years. In almost all cases, a tracheostomy was required to manage the acute airway obstruction [9]. Breaking ground in fetal medicine, a recent report showcased the Ex-utero intrapartum treatment (EXIT) procedure's effectiveness in stabilizing the fetal airway in three micrognathia cases. The EXIT procedure is a lifesaving intervention for fetuses with congenital airway abnormalities, including upper and lower airway obstructions, providing a controlled environment for secure airway establishment and temporary respiratory support during the perinatal period [10]. Commonly, EXIT is indicated for large oropharyngeal masses, intrinsic airway obstruction, or severe micrognathia [11]. By harnessing uteroplacental circulation, this technique enabled pre-surgical management and improved outcomes.

CONCLUSION

This case report highlights the rare and lethal congenital anomaly, otocephaly, presenting with severe craniofacial malformations and upper airway obstruction. Despite advances in prenatal diagnosis and management, OC remains a significant challenge due to its complex nature and poor prognosis. Recent studies, however, offer hope for improved outcomes in isolated agnathia cases with timely airway management and innovative interventions, such as the EXIT procedure. Our case underscores the importance of prenatal diagnosis and counseling, multidisciplinary care teams, advanced imaging techniques, and innovative airway management strategies. Future research should focus on improving prognostic indicators, developing novel prenatal interventions, and enhancing multidisciplinary collaboration. This report contributes to the limited literature on OC, emphasizing the need for continued exploration and innovation in managing this complex and rare congenital anomaly.

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Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Kumble A, Phadke AK, Raikar P, Siriac A. Otocephaly revealed: A case study of a rare facial anomaly. Indian J Case Reports. 2024; December 02 [Epub ahead of print].