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Cyclopia Associated with Sexual Ambiguity Discovered at the Birth of a Newborn Whose Mother Contracted COVID-19 in Early Pregnancy: A Rare Case at the Teaching Hospital of Angre (ABIDJAN)

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Abstract

Cyclopia is a rare congenital brain malformation frequently associated with facial anomalies. It is characterized by the presence of a single eye with varying degrees of doubling of the intrinsic ocular structures located in the middle of the face. It is the most severe facial expression of holoprosencephaly. Its aetiology is still poorly understood, but several factors could play a role in its occurrence, including certain viruses contracted during pregnancy. Obstetrical ultrasound has made antenatal diagnosis and the search for associated malformations possible. This diagnosis must be made antenatally because the prognosis is poor, hence the decision to terminate the pregnancy. We report a case of cyclopia associated with ambiguity of the external genitalia, discovered intraoperatively in a patient with poor prenatal follow-up, in whom a coronavirus infection (COVID-19) had been diagnosed in early pregnancy.

Keywords

Cyclopia, Holoprosencephaly, Congenital Malformation, COVID-19

1. Introduction

Cyclopia (also cyclocephaly or synophthalmos) is a rare form of holoprosencephaly. It is a congenital malformation characterized by the inability of the embryonic prosencephalon to properly divide the eye sockets into two cavities. It is the most

severe facial expression of holoprosencephaly syndrome. According to De Meyer's classification, there are three forms of increasing severity of HPE: lobar, semi-lobar and alobar [1]. Cyclopia presents mainly as the alobar type, where there is a complete or near-complete deficit of the interhemispheric fissure and varying degrees of separation of the prosencephalon. Typically, the nose is missing or replaced by a non-functioning nose in the form of a proboscis. The incidence is 1 in 100,000 newborns. The etiology of this rare, life-incompatible syndrome is still largely unknown, with most cases being sporadic. According to the literature, various risk factors were implicated in the pathogenesis of cyclopia, such as diabetes and genetic factors [2].

Although certain viruses contracted in early pregnancy have been incriminated in the development of this pathology in the foetus, formal proof of their involvement has not yet been demonstrated. Through this clinical case, we would like to draw attention to a potential link between the Coronavirus and this pathology.

2. Case Report

This was a 32-year-old G2P0 patient (with a voluntary termination of pregnancy) who was transferred from a community health centre to our department for the transverse presentation of a 40-week + 2-day pregnancy in active labour.

The pregnancy was poorly monitored, as the patient had only 2 antenatal consultations. She did not have any biological tests or ultrasound. She contracted the COVID-19 infection when she was 11 weeks of amenorrhoea, without any signs of severity. She was, therefore, quarantined and given only symptomatic treatment, which progressed well. No other intercurrent pathology during pregnancy had been noted.

After her second antenatal visit at 21 weeks by a midwife, she did not have subsequent visits to the health centre until uterine contractions began. It was then that she went to the community health centre, which transferred her to us.

She had no known pathological history, nor was there any family history of malformation or consanguineous marriage.

When she was admitted to our department, we decided to perform a caesarean section due to the transverse presentation in the active phase of labour (the cervix was dilated to 6 cm). Intraoperatively, we extracted a fetus weighing 3200 g, poly malformed with cyclopia combining the presence of a single eye on a horizontal slit in the middle of the forehead, a total absence of nose and malformations of the hands and ambiguity of the external genitalia (**Figure 1** and **Figure 2**). The newborn's APGAR score was 6 at 1 minute and 3 at 5 minutes. He died 30 minutes after birth. An X-ray of the skull revealed a single orbital cavity at eye level and no nasal structures. The karyotype could not be performed because of the non-accessibility of the examination in our context and also due to the parent's refusal.

3. Discussion

Cyclopia results from incomplete cleavage of the prosencephalon in the right and

Figure 1. The face of the newborn.

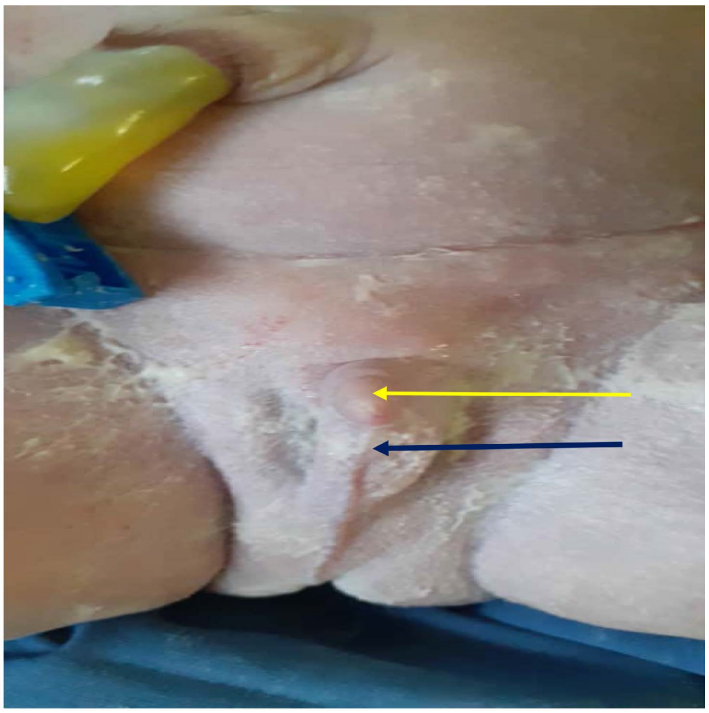

Figure 2. Ambiguous genitalia (the yellow arrow denotes the penis and the blue arrow the vulva).

left hemispheres occurring between 18 and 28 days of gestation [1]. The exact causes of cyclopia remain unknown as most cases are sporadic. However, several factors were suggested in the literature that should be involved. These include genetic and environmental factors. Environmental factors include maternal diabetes (the only officially recognised environmental factor with a 1% risk and a 200-fold increase in fetal holoprosencephaly), infections during pregnancy (Toxoplasmosis, rubella, cytomegalovirus and herpes), certain medications during pregnancy (alcohol, aspirin, lithium, anticonvulsants, hormones, retinoic acid, anticancer agents and fertility drugs), physical agents such as ultraviolet light, previous

pregnancy loss and first trimester bleeding. Genetic factors are mainly represented by trisomy 13, consanguineous marriages [2].

Some authors have described cases of cyclopia in newborns whose mothers were infected with certain viruses, such as cytomegalovirus and HIV, during pregnancy [3] [4].

Although some of the viruses mentioned above were implicated in the occurrence of cyclopia, no case of association of COVID-19 during pregnancy and cyclopia was reported to date. In our patient, despite infection with Coronavirus in early pregnancy, the pregnancy was diagnosed at 11 weeks, beyond the period of prosencephalon cleavage.

To date, no study has accurately demonstrated the mechanism by which these viruses may cause cyclopia. However, the transplacental passage of these viruses during pregnancy could cause damage to the developing cells of the fetus and promote this pathology.

Certain anomalies may be associated with cyclopia, such as polydactyly [5]. In our case, the newborn had a sexual ambiguity of hermaphroditism, with a micropenis instead of a clitoris and a vulva. We were not able to carry out the karyotype, as this examination is almost impossible to carry out in our context (inaccessible or even unavailable).

Diagnosis can be made during pregnancy by ultrasound. An ultrasound scan at the end of the first trimester or in the second trimester can usually show clear signs of cyclopia or other forms of holoprosencephaly. In addition to orbital hypotelorism, abnormal formation of the fetal brain and internal organs may be seen on ultrasound [6]. When an ultrasound shows an abnormality but cannot provide a clear picture, the doctor may recommend fetal magnetic resonance imaging (MRI). If the diagnosis is made during pregnancy, medical termination may be discussed with the parents.

If cyclopia is not diagnosed during pregnancy, it may be diagnosed at birth, following an examination of the newborn. This was the case with our patient, who was diagnosed at birth. In fact, in our context, many patients have a poor follow-up of their pregnancy and generally do not carry out prenatal check-up because of unfavourable socio-economic conditions.

Most fetuses die in utero or sometime after birth, as reported in our observation, where the newborn died 30 minutes after birth.

4. Conclusion

Cyclopia is a serious malformation that is incompatible with life. The aetiology remains unknown, but several environmental and viral factors are believed to be involved in its occurrence. Several grey areas exist concerning this disease, notably the involvement of certain viruses in its occurrence, which should be the subject of research. In our regions, where prenatal consultations are not properly followed up, with no prenatal ultrasound, the diagnosis can only be made in the delivery room.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. Informed consent from the patient regarding the use of her data for medical studies/research was taken.

Conflicts of Interest

All authors declare that they have no conflict of interest.

References

[1] Turgut, A.Ç., Hall, W.A. and Turgut, M. (2019) Three Mythic Giants for Common Fetal Malformation Called "Cyclopia": Polyphemus, Tepegöz, and Grendel. *Child's Nervous System*, **37**, 725-726. https://doi.org/10.1007/s00381-019-04207-y

[2] Kumar, V., Devi, S. and Singh, K. (2020) A Review on Holoprosencephaly Disease (CYCLOPIA): Risk Factors, Causes, Pathophysiology and Diagnosis with Spotlight of Various Features Reported in Cases. *International Journal of Research in Pharmaceutical Sciences*, **11**, 4170-4181.

[3] Byrne, P.J., Silver, M.M., Gilbert, J.M., Cadera, W., Tanswell, A.K. and Reynolds, J.F. (1987) Cyclopia and Congenital Cytomegalovirus Infection. *American Journal of Medical Genetics*, **28**, 61-65. https://doi.org/10.1002/ajmg.1320280110

[4] Liu, D.P., Burrowes, D.M. and Qureshi, M.N. (1997) Cyclopia: Craniofacial Appearance on MR and Three-Dimensional CT. *American Journal of Neuroradiology*, **18**, 543-546.

[5] Singh, K., Sharma, S., Agarwal, K. and Kalra, A. (2018) Cyclopia-Otocephaly-Agnathia-Synotia-Astomia Complex: A Case Report. *Journal of Clinical Neonatology*, **7**, 177-180. https://doi.org/10.4103/jcn.jcn_23_18

[6] El-Dessouky, S.H., Aboulghar, M.M., Gaafar, H.M., Abdella, R.M., Sharaf, M.F., Ateya, M.I., *et al.* (2020) Prenatal Ultrasound Findings of Holoprosencephaly Spectrum: Unusual Associations. *Prenatal Diagnosis*, **40**, 565-576. https://doi.org/10.1002/pd.5649