Median Facial Cleft

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Introduction

Median or midline clefts are rare congenital anomalies and account for approximately 0.38–3% of orofacial clefts.[1,2]

Definition

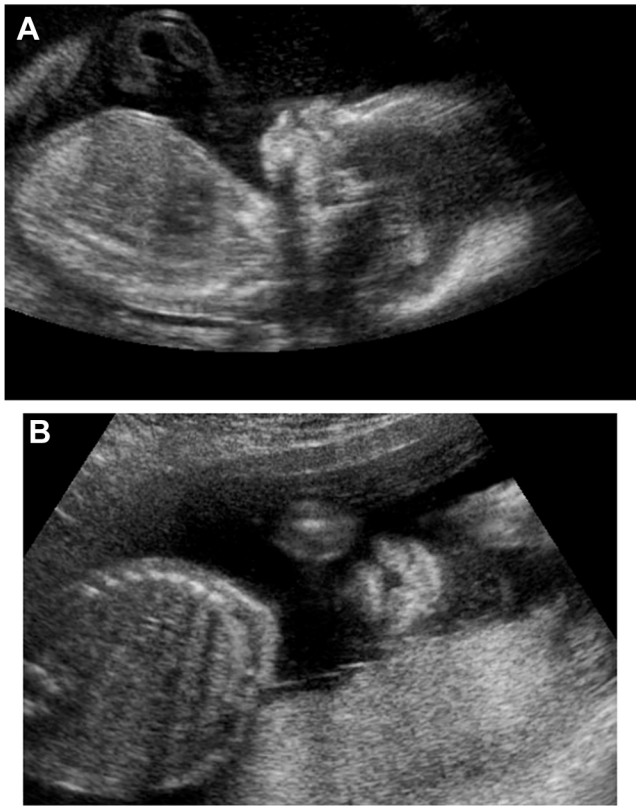
A median cleft occurs when the defect is in the median line of the face. A median cleft may be complete, extending up to and involving the nasal cavity and maxilla, or incomplete, transgressing only a portion of the vermillion.

Ultrasound Findings

The coronal view can demonstrate the extent of separation of the lip in the midline and the appearance of the nares and nasal contour. The sagittal plane is useful in the evaluation of the profile for evidence of midface hypoplasia, the presence of the nasal bone, nasal tissue, the presence of a proboscis, and the appearance of the forehead (Figure 1). The axial scan should be used to assess the size and position of the fetal orbits and to assess for defects of the palate. Imaging the fetal palate can be enhanced with the use of specialized techniques, such as a reverse-face or flipped-face technique.[3-5] In addition, a three-dimensional surface rendering can be helpful to evaluate the size and position of the fetal ears and to evaluate the palate; this can be useful in providing information to inform discussions with a multidisciplinary team (Figure 2).

Uniform terminology to describe the sonographic findings is encouraged. The location of the cleft should be identified (median or midline) and the extent of soft tissue involvement (complete or incomplete) should be reported. The normal or

FIGURE 1
Two-dimensional views



A, Two-dimensional midsagittal view of a second-trimester fetus shows an abnormal contour of the upper lip. **B,** Coronal view of the same fetus shows a median gap in the upper lip (median cleft lip).

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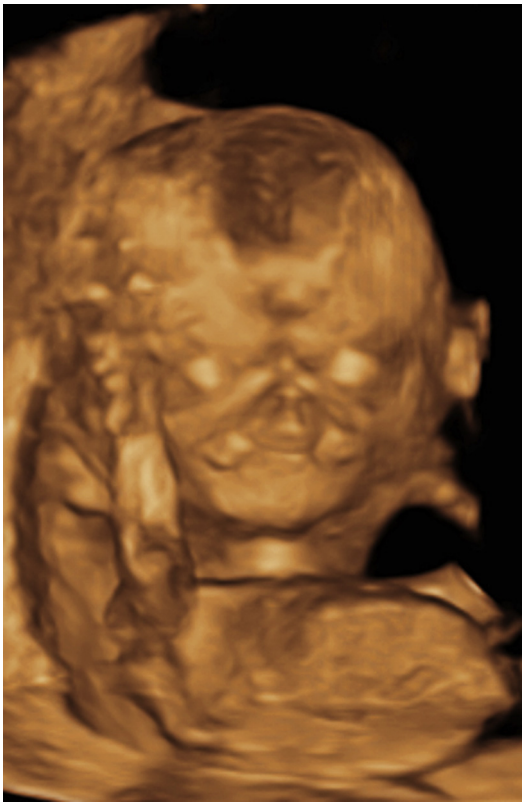
FIGURE 2
Three-dimensional rendering



Three-dimensional view of a fetus at 14 weeks of gestation shows a large median cleft that involves the lip and nose.

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abnormal appearance of other craniofacial features, such as the palate, nose and nares, and orbits and eyes, should be reported.

The diagnosis of a facial cleft can be made in the first trimester by evaluation of the retronasal angle, the frontonasal space distance, and the continuity of the maxilla.[6-9] Associated abnormalities of the central nervous system, such as holoprosencephaly, should be identifiable between 11 and 13 weeks of gestation.[10]

Associated Abnormalities

A median cleft lip may be small and isolated or may be large and associated with numerous other structural anomalies. A detailed anatomic assessment of the fetal anatomy is required, including a neurosonogram and a detailed evaluation of the fetal heart and distal extremities. Median clefts may be seen with hypertelorism or hypotelorism, which includes cyclopia. There may be arrhinia (absent nose), bifid nose, or a proboscis (a malformed tubular structure usually in a supraocular location). Central nervous system abnormalities, such as holoprosencephaly or agenesis/lipoma of the corpus callosum, may help in the identification of a syndromic cause. Evaluation of the hands (for polydactyly) and the musculoskeletal system is critical.

Differential Diagnosis

The differential diagnosis of a median cleft is largely dependent on the size of the abnormality and the association with other structural anomalies.[2] Primary craniofacial syndromes that are associated with a median facial cleft are typically within the holoprosencephaly spectrum and are often secondary to aneuploidy, particularly trisomy 13. Frontonasal dysplasia or median cleft face syndrome are considerations when a median cleft (either complete or incomplete) is associated with hypertelorism. A median cleft with nasal polyp and lipoma of the corpus callosum should raise the suspicion of Pai syndrome, which is a developmental disorder that can include nasal polyps and other anomalies. Other syndromes that are associated with a median cleft include short rib-polydactyly syndrome type 2 (Majewski syndrome) and orofacial digital syndrome. Numerous chromosomal and genetic syndromes have been associated with median cleft lip.

Genetic Evaluation

Diagnostic testing (amniocentesis or chorionic villus sampling) with chromosomal microarray analysis (CMA) should be offered when a midline cleft is detected. Given the association with holoprosencephaly and trisomy 13, it is reasonable initially to perform karyotype analysis or fluorescence in situ hybridization, with reflex to CMA if these test results are normal. After appropriate counseling, cell-free DNA screening is an option for patients who decline diagnostic evaluation because it will detect most cases of trisomy 13 and other common aneuploidies. If there are additional anomalies, consanguinity, or a family history of a specific condition, gene panel testing or exome sequencing is sometimes useful because CMA does not detect single-gene (Mendelian) disorders. If exome sequencing is pursued, appropriate pretest and posttest genetic counseling by a provider who is experienced in the complexities of genomic sequencing is recommended.[11]

Pregnancy and Delivery Management

A detailed sonographic evaluation should include an assessment of the other structures within the fetal face, including evaluation of the orbits and distal extremities for evidence of finger anomalies, detailed neurosonography, and consideration of a fetal echocardiogram. Fetal magnetic resonance imaging should also be considered if intracerebral findings are suspected. Referrals to a craniofacial clinic or pediatric plastic surgery should be considered, along with additional referrals as indicated. Pregnancy termination is an option for all patients in whom a fetal anomaly is detected and should be discussed with patients with a fetal midline cleft, particularly if other anomalies are present. The finding of a fetal midline cleft does not generally alter the mode of delivery, although delivery should occur at a center that can provide teaching and support regarding neonatal feeding.

Prognosis

Prognosis is variable and favorable if isolated; however, a midline cleft is often associated with intracerebral anomalies or syndromes. More severe clefts, as characterized by facial and eye findings, are more likely to be associated with developmental delay. Prognostic counseling is greatly dependent on these variables and can be aided by appropriate diagnostic testing.

Summary

The finding of a median cleft should prompt a detailed sonographic evaluation of the fetus to look for associated anomalies. Prognosis is dependent on the underlying cause and associated anomalies. Diagnostic genetic testing is recommended. A multidisciplinary team should be convened for consultation concerning postdelivery surgical management, feeding considerations, and genetic counseling. ■

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