Mandibular condyle hypoplasia in children with isolated unilateral congenital aural atresia

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Introduction

• The mandible, external ear, and middle ear structures are embryologic derivatives of the 1st and 2nd pharyngeal arches (Fig. 1).
• Congenital aural atresia is a component of numerous syndromes and is often seen in association with other developmental abnormalities of craniofacial structures.
• Hemifacial microsomia is a spectrum of malformations involving 1st and 2nd pharyngeal arch derivatives.
• Embryologic, epidemiologic and morphologic commonalities among congenital microtia, congenital auricular atresia and hemifacial microsomia suggest that they may represent variable manifestations of the same underlying disorder.
• Anomalies of the mandible co-exist with aural atresia in children with hemifacial microsomia, but little is known about how the mandible may be affected in children with isolated non-syndromic unilateral congenital aural atresia.

Methods

• Computed tomography (CT) scans of the temporal bones of 68 children with isolated non-syndromic unilateral congenital aural atresia were reviewed.
• Images were viewed in the transverse (axial) plane perpendicular to the axis of the mandibular ramus and scanned from the mandibular notch to the condylar top.
• The slice where the mandibular condyle had the largest cross-sectional area was measured on each side (Fig 2), and the Jahrsdoerfer score was calculated for the atretic ear.
• Paired t-test was used to compare condyle cross-sectional area on the side of the aural atresia with the contralateral normal side.
• Multiple linear regression with standard least square estimates was used to assess the impact of age, sex and Jahrsdoerfer score on the cross-sectional area of the condyles.

Discussion

• These data suggest that:
  1. Isolated unilateral congenital aural atresia is associated with mild hypoplasia of the mandibular condyle on the side of the atresia.
  2. The severity of middle ear malformation is not related to the degree of condylar hypoplasia.
• This supports the hypothesis that congenital aural atresia is a manifestation of hemifacial microsomia in which mandibular hypoplasia may be subclinical.

Results

• The sample population was 53% males and the atretic ear was on the right side in 69% of cases. Mean age at the time of the CT scan was 62.0 ± 43.4 months and ages ranged from under one month to 206 months.
• Mandibular condyle cross-sectional area across the two sides was highly correlated, and the condyle ipsilateral to the aural atresia was, on average, 8.41 mm² smaller than the contralateral normal condyle (P < .001, R² = .797; Fig 3).
• When controlling for age and sex, the Jahrsdoerfer score did not impact cross-sectional area of the mandibular condyle (P = .97).

References


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