A case of Goldenhar-Gorlin syndrome with unusual association of hypoplastic thumb

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A case of Goldenhar-Gorlin syndrome in a seven-month-old male infant presented with the features of epibulbar dermoid, microtia and hemifacial microsomia associated with thumb defect. The dermoid was bilateral and microtia was unilateral. Preauricular appendages and pits were double and single respectively on both the sides. Hemifacial microsomia was unilateral and was associated with cleft lip, macrostomia, dental misalignment, large tongue and high arched palate. The association of hypoplastic thumb with Goldenhar-Gorlin syndrome has not been documented in the past.

Key words: Epibulbar dermoid, Goldenhar-Gorlin syndrome, hemifacial microsomia, hypoplastic thumb, microtia

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Goldenhar-Gorlin syndrome manifests a number of craniofacial abnormalities that usually involve the face (hemifacial microsomia), eyes (epibulbar dermoid) and ears (microtia). It may also be associated with varying degrees of systemic and vertebral malformations. This syndrome presents at birth and the exact etiology is still unknown. The affections of the neural crest cells may have some role in the multiple malformations of the Goldenhar-Gorlin syndrome.[1] The association of cardiac, pulmonary, central nervous system, renal and vertebral abnormalities have been described.[2-4] Other skeletal malformations like extra ribs were reported.[5] We report a rare case of Goldenhar-Gorlin syndrome with unique association of an isolated thumb hypoplasia.

Case Report

A seven-month-old male infant presented with fleshy masses in both eyes and facial deformity since birth. He was delivered normally at term by a 21-year-old mother. There was a history of taking multivitamin during her pregnancy but the exact nature and doses were not clear. His parents were non-consanguineous and belonged to the lower socioeconomic class. No other family members had such facial deformity or defect in the eyesight. On clinical examination the patient had right-sided hemifacial microsomia with malar hypoplasia, micrognathia and apparent macrostomia. The tongue was large and the palate was high arched. He had right lateral cleft lip with dental misalignment [Fig. 1]. Both ears were well formed with normal auditory functions but the right ear was slightly smaller (microtia) than the left one. Accessory preauricular appendages, two on each side were noticed in front of the auricle. A preauricular pit was found at a lower level near the angle of the mouth on both sides. Left-sided pit was surrounded by skin fold [Figs. 2, 3]. Both eyes had inferotemporal limbal dermoid which did not obstruct the pupil. Lipodermoids were present at the outer angle on each eye; the left one was larger and continuous with the corresponding dermoid [Figs. 2, 3]. Patient had right-sided hypoplastic thumb with flattened thenar muscles. It was shortened and dangled from the radial border of the hand resembling "floating" thumb [Fig. 4]. Both the forearms and arms were normal. Other systemic examinations revealed no abnormality.

Figure 1: The clinical photograph of the face showing left-sided hemifacial microsomia with right microtia and right lateral cleft lip with macrostomia

Hemivertebra or butterfly vertebra defects were not found on complete spine films. X-ray of the right hand showed small first metacarpal (like phalanx) with deformed floating right thumb [Fig. 5]. Computed tomography (CT) scan of the brain, ECG and chest X-ray were within normal limits. The patient winced

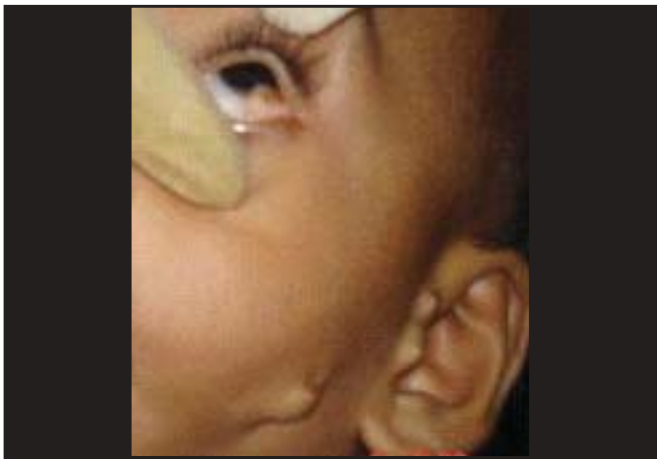

Figure 2: The clinical photograph of the left side of the face showing limbal dermoid, preauricular appendages and pit

Figure 3: The clinical photograph of the right side of the face showing limbal dermoid, preauricular appendages and pit

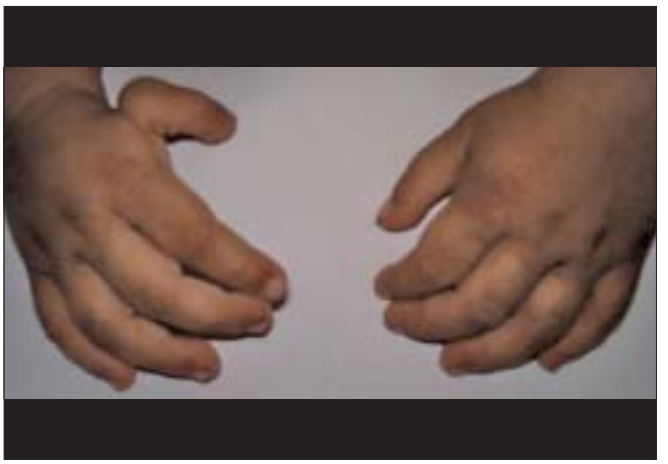

Figure 4: The clinical photograph of the hands showing right hypoplastic (floating) right thumb

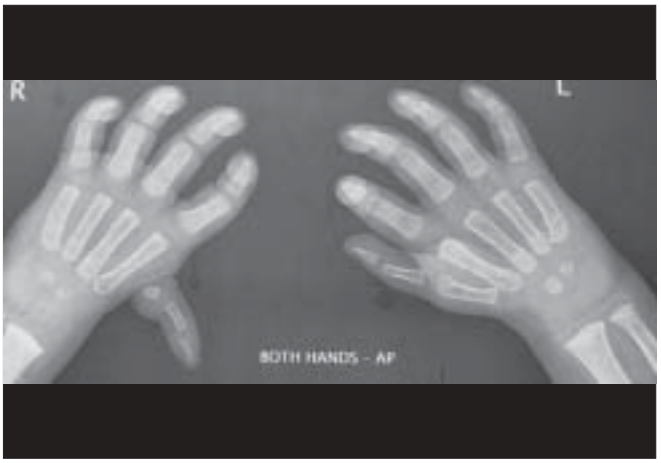

Figure 5: X-ray of the right hand shows small first metacarpal (like phalanx) with floating right thumb

to flashlight, but a cycloplegic refraction revealed significant astigmatism in both eyes. Right eye had +0.50 diopter sphere (Dsph) with +4.00 diopter cylinder (Dcyl) 140° and left eye showed +1.50 Dsph with +5.00 Dcyl 160° axis. The patient was given appropriate spectacles correction and was referred to a plastic surgeon for cleft lip repair.

Discussion

The Goldenhar syndrome was originally defined as a triad of congenital abnormalities consisting of epibulbar dermoid, preauricular appendages and pretagal fistulae. After Gorlin, the asymmetry of the face or hemifacial microsomia was also described as an usual association of this triad.[6] Goldenhar-Gorlin syndrome is a congenital malformation of the structures derived from the first and second pharyngeal arches.

Hemifacial microsomia is a flattening of the face due to underdeveloped mandible (micrognathia), maxilla and zygomatic bones with hypoplastic muscles for mastication and facial expression. The association of the lateral cleft lip with the hemifacial microsomia is not so common.[2] The clefting of the lip usually occurs due to the failure of fusion between the maxillary and the medial nasal prominence.[1]

The epibulbar limbal dermoid and lipodermoid are choristomas which are normal tissue in abnormal position. Bilateral limbal dermoids are rare in occurrence.[2] Lipodermoids are fibrofatty tissue commonly located in the superotepmoral epibulbar region and are generally bilateral. The larger one approaches the limbus and may blend with the adjoining dermoid.

Microtia involves defects of the auricle that range from absence of the ear (anotia) to small but well-formed ears. The external ear is developed from the hillocks on the first and second pharyngeal arches which are largely formed by neural crest cells. These cells play a role in most of the ear deformities. Appendages are abnormal developments of the accessory auricular hillocks whereas pits may indicate maldevelopment of the hillocks.[1]

The syndrome presents at birth and its occurrence varies so much that actual modes of inheritance are only rarely documented.[5] The present case was sporadic in nature. The sporadic nature can be better explained in the line of teratogenic effects of drugs on embryogenesis. In our case there was a history of taking multivitamins by the mother during pregnancy. Mounoud *et al*.[7] reported a case of Goldenhar having a history of Vitamin A intoxication of the mother. Daily dose of 25000 IU of Vitamin A has teratogenic effects.[1] That teratogen produces ill effects on neural crest cell formations which are essential for the formation of pharyngeal arches. Disruption of crest cells' development results in variable craniofacial and ear malformation. Such crest cells appear to be vulnerable due to lack of superoxidase and catalase enzymes. Those enzymes are responsible for scavenging toxic free radicals.[1]

Hypoplasia of the thumb is a type of distal form of ectromelia.[8] Longitudinal or particle suppression of the limb buds results in ectromelia.[9] The type and shape of the hand are regulated by HOX genes which are governed by the neural crest cells.[1,10] So teratogenoic effect of Vitamin A on neural crest cells' formation may cause non-regulation of HOX genes that may produce characteristic features in this syndrome. The rare feature of this present case was the bilateral ocular involvement with epibulbar dermoid and extensive lipodermoid. After extensive MEDLINE search, we observed that the association of a thumb hypoplasia with the Goldenhar-Gorlin syndrome has not been reported so far.

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