

Hemifacial Microsomia—Oculo-auriculo-vertebral Dysplasia*

A Patient with Overlapping Features

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In 1952 Goldenhar, an ophthalmologist, reported a patient with an epibulbar dermoid associated with malformations of the external and middle ear, all on the left side. A skeletal survey on this patient did not reveal the presence of any malformations of the vertebrae or elsewhere. Goldenhar also tabulated 30 other cases with epibulbar dermoids and ear abnormalities reported in the literature. He concluded that the triad of epibulbar dermoids, pre-auricular skin tags, and fistulae is a rare but specific complex of malformations. This triad was later referred to as the oculo-auricular syndrome (Hoffmann-Egg and Velissaropoulos, 1953; Vannas, 1955). Goldenhar also compared the features of the oculo-auricular syndrome with those of mandibulofacial dysostosis. He referred to three atypical cases of the latter (Jorio, 1936; Tranon-Sfalangaon and Velissaropoulos, 1951; Paufigue, Etienne, and Moreau, 1952), and suggested that a relation existed between the oculo-auricular syndrome and mandibulofacial dysostosis.

Weyers and Thier in 1958 described three cases of what they referred to as the oculovertbral syndrome characterized by unilateral malformations of the eye, the bones of the face, and vertebral anomalies. They emphasized that this syndrome differed from the oculo-auricular syndrome described by Goldenhar.

In 1963, Gorlin *et al.* reviewed the symptom complex bearing the eponym of Goldenhar. They combined the 'oculo-auricular syndrome' with the 'oculo-vertebral syndrome', and introduced the term 'oculo-auriculo-vertebral dysplasia' to signify the idea that both 'syndromes' may be ill-defined variants of the same dysmorphogenetic process. They noted that the ear abnormalities were as a rule bilateral, the dermoid and epidermoids were bilateral in three-quarters of the cases, and the upper lid colobomas were rarely bilateral. They went one

stage further (Gorlin and Pindborg, 1964) and suggested that the syndrome of hemifacial microsomia (unilateral microtia, macrostomia, and failure of formation of the mandibular ramus and condyles) may also be an expression of oculo-auriculo-vertebral dysplasia. The best evidence that the one syndrome is a variant of the other would be the demonstration that both syndromes occur in the same sibship more often than expected by chance; however, a case showing overlapping features would also support the hypothesis. No familial cases have been reported, but the present paper describes a patient who presents features of both oculo-auriculo-vertebral dysplasia and hemifacial microsomia.

Case History

The patient was a Caucasian female of French-Canadian descent, born to parents who are first cousins. There were no known relatives with eye or ear malformations among 6 uncles and aunts and 7 first cousins. The mother and father were 25 and 30 years old, respectively, when the baby was born. They had been married for 10 months and the patient represented the only conception. The 40-week gestation was complicated only by a mild degree of morning sickness in the first two months and a moderate degree of nausea thereafter. A medication taken for the mother's nausea could not be identified. There was a history of frequent headaches for which aspirin was taken. There was no history of exposure to radiation during pregnancy, and the use of abortifacients was denied. The total weight gain was 10.9 kg. The labour and delivery were unremarkable, and the infant was not cyanotic, apnoeic, or flaccid. The birthweight was 2637 g. Multiple congenital malformations of the face and extremities were noted at birth and the infant was referred to The Montreal Children's Hospital for diagnosis.

Physical examination. At 6 days of age she weighed 2550 g., was 48 cm. long, and had a head circumference of 35 cm. There was marked frontal bossing (Fig. 1). The nasal root was broad and flat, but there were no inner epicanthic folds. The nose was short with an

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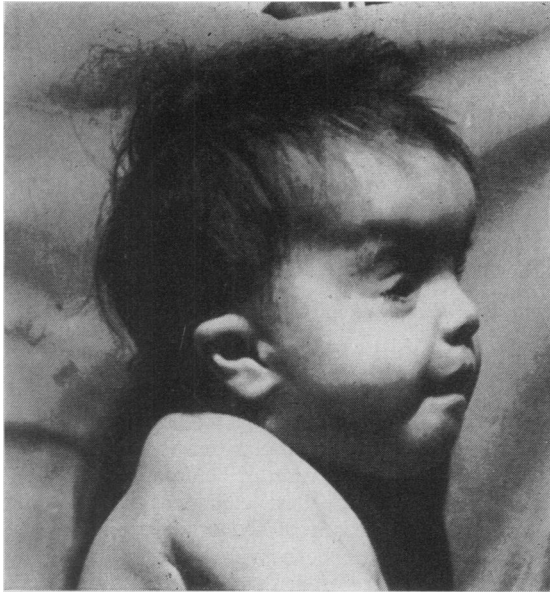


FIG. 1. Profile view of the patient at 8 months of age showing frontal bossing, indented fronto-temporal regions, and abnormally low-set ears, with a grade 1 type of deformity.

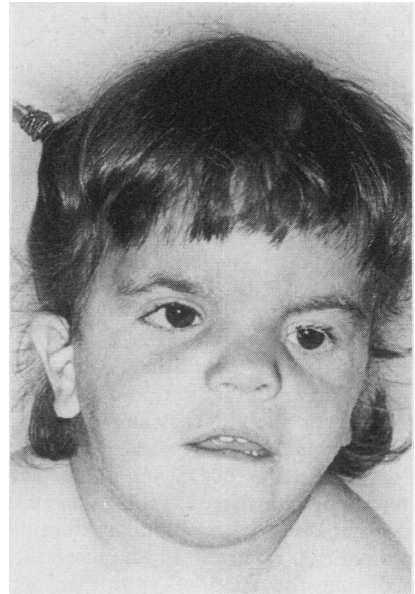


FIG. 2. Full face view of the patient at 2 years and 3 months of age showing microphthalmia, antimongoloid slant of palpebral fissures, asymmetry of the face and nostrils, and pre-auricular tags.

anteverted tip exposing asymmetrical nostrils with protrusion of the skin on the medial wall of the left nostril orifice (Fig. 2).

Both eyes were microphthalmic and the palpebral fissures showed a slight antimongoloid slant. The left upper lid showed a coloboma in its medial segment. No colobomata of the iris or choroid were noted. The right upper lid showed a very small notch in its medial segment (Fig. 3a and 3b). The lower lid margins were irregular, causing irritation of the eyes by the lashes. The fundi were normal.

Both ears were small, low set, and rotated posteriorly. The external ears showed a grade 1 deformity (by the criteria of Pruzansky, 1969). The left external auditory meatus was very small, making it difficult to visualize the ear-drum. A pedunculated pre-auricular skin tag,

approximately 0.5 cm. long, was present. The right external auditory meatus was larger than the left and a normal ear-drum was seen. There were two sessile skin tags in the pre-auricular region.

The frenulum between the upper lip and gum was prominent and formed a midline ridge continuous with a cleft of the alveolus. The secondary palate showed a posterior cleft.

There were bilateral indentations overlying the fronto-temporal junction of the head, and the face was smaller on the left side than on the right.

The fifth fingers showed clinodactyly and a flexion deformity that was more marked on the left side (Fig. 4). Both feet showed a calcaneovalgus deformity. There was limitation of extension in the hips, knee, and elbow

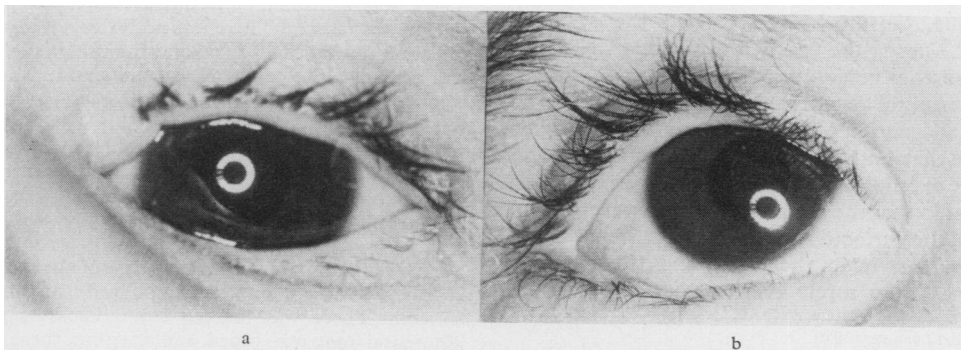


FIG. 3a and b. Close-up view of the eyes showing (a) the left upper lid with a coloboma in the medial segment (note that the film over the inner and lower quadrant of the eye is a photographic artefact), and (b) the right upper lid showing a very small notch in the medial segment.

joints, with marked limitation of movement of the neck on lateral rotation. The heart, lungs, abdomen, and genitalia were normal.

X-rays of the skull did not reveal a bony basis for the indentations noted. An extra transverse suture in the mid-parietal area was present, together with numerous linear defects converging to meet around the lateral fontanelle. Hypoplasia of the middle phalanx of the fifth fingers and of the first metacarpals was present. The dorsolumbar vertebrae were described as being very slightly hypoplastic. The sacral alae were unusually small and the pelvis therefore unusually narrow. These changes were considered to be secondary to delayed motor development.

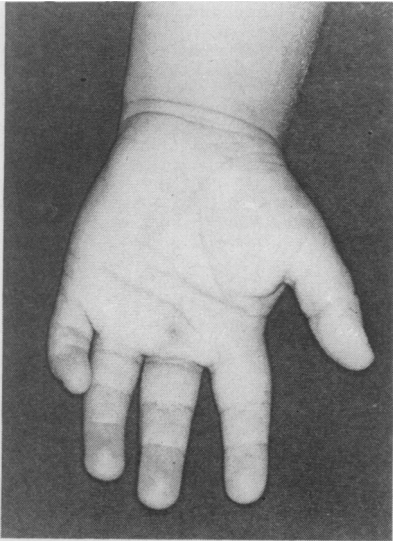


Fig. 4. Palmar view of the right hand showing a flexion deformity of the fifth finger.

Numerous measurements of blood and urine constituents were reported within normal limits. An electrocardiogram showed right axis deviation. Hearing was tested and a normal response was obtained at 2 months of age. A karyotype prepared from peripheral blood culture was normal.

The child was seen again at 8 months of age. The right pre-auricular tag had fallen off. The length was 62½ cm. (below 3rd percentile), and the weight was 6.5 kg. (below 50th percentile). The child was able to sit with support, transferred objects from one hand to the other, and turned from prone to the supine position. She smiled spontaneously but did not say any words. There was (as a result of physiotherapy) a normal range of movements for all the joints, except the fifth fingers. Her face appeared more asymmetrical than at birth and the bilateral fronto-temporal depressions were still present.

She returned at 2 years and 3 months, at which time her height was 80 cm. (3rd percentile), weight 12 kg.

(below 50th percentile). Her face was obviously asymmetrical, the left side being flatter than the right. The bilateral fronto-temporal depressions were not as obvious as before. The eye and ear defects were as noted previously. Her teeth were very small and the incisors were peg-shaped. The child was quite friendly and smiled easily. The gross motor development was normal for age, but the fine motor development was slightly delayed. Language was delayed: she imitated speech sounds and made herself understood but could not combine two different words or point to named parts. She could help mother remove the garments but was unable to do it on her own.

Comments

The features supporting the diagnosis of oculo-auriculo-vertebral dysplasia in this case are: bilateral colobomata of the upper lids in their medial segments, slightly irregular margins of the lower lids, anti-mongoloid slant of the palpebral fissures, microphthalmia, frontal bossing, microtia, deficiency of the external auditory meatus, bilateral supernumerary pre-auricular skin tags, and a slight degree of mental retardation.

In contrast the diagnosis of hemifacial microsomia is suggested by unilateral facial hypoplasia associated with microtia, in the absence of epibulbar dermoids and vertebral anomalies.

The absence of lower lid coloboma, hair tongue, and a negative family history argued against the diagnosis of mandibulofacial dysostosis.

The absence of epibulbar dermoids and vertebral anomalies in this patient led the authors to question the diagnosis of oculo-auriculo-vertebral dysplasia made when the infant was first seen. It is noteworthy that Goldenhar's original case was reported to have 'no skeletal abnormalities'. Gorlin *et al.*'s second case (1963), Sugar's second case (1966), and Summitt's patient (1969) were all reported to have normal vertebrae. Upper lid colobomata were absent in Goldenhar's original patient, one of Sugar's patients, and in Summitt's patient. Epibulbar dermoids were absent in the case described by Nessim-Morcos, Mathalone, and Kessel (1968). It is apparent that vertebral anomalies, upper lid colobomata, and epibulbar dermoids are not obligatory findings in oculo-auriculo-vertebral dysplasia.

The overlapping features of the oculo-auriculo-vertebral dysplasia and hemifacial microsomia observed in the present case support Gorlin's suggestion that one syndrome is a variant of the other, and leads to the prediction that other patterns of expression will be recognized in the dysmorphogenetic spectrum which includes oculo-auriculo-vertebral dysplasia and hemifacial microsomia.

The aetiology remains obscure. Though the consanguineous parentage in this case supports autosomal recessive inheritance, the lack of reports of affected sibs argues against it. Further family studies may help to resolve the problem.

Summary

A patient presented with overlapping features of oculo-auriculo-vertebral dysplasia and hemifacial microsomia, supporting the idea that both syndromes may represent variations in the spectrum of anomalies that can arise from the same dysmorphogenetic entity.

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