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Case Report

Dentistry Section

Goldenhar Syndrome - Review with Case Series

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ABSTRACT

Goldenhar's syndrome is a rare condition which was described initially in the early 1950s. It is characterized by a combination of anomalies: dermal epibulbar cysts, auricular appendices and malformations of the ears. In 1963, Gorlin suggested the name, oculo-auriculo-vertebral (OAV) dysplasia for this condition and he also included vertebral anomalies as signs of this syndrome. The aetiology of this rare disease has not been fully understood, as it has shown itself to be variable genetically and to be caused due to unclear reasons. Here, we are reporting two cases of Goldenhar's syndrome, where almost all the classical signs of this rare condition were present.

Keywords: Deformity, Oculo-auriculo-vertebral, Goldenhar's syndrome, Auricular appendices

CASE REPORT 1

A seven-year-old female patient came to our Department of Oral Medicine and Radiology with the complaint of decay in the upper left posterior teeth. Her medical history was not contributory. She gave a history of surgeries which were done on the second day after her birth and at the age of three months, for correction of cleft lip and palate. The patient's parents were not related to each other and she had one younger brother who was apparently normal and healthy.

On general examination, the patient did not reveal any systemic disease and her IQ for her age was normal. On extra-oral examination, a facial asymmetry with hypoplasia was seen on the left side of her face . There was no vision in the left eye, left ear was malformed, with a hearing disability and mouth was deviated towards the left side. There was an accessory tragus on both sides and a surgical scar on the upper lip, which were suggestive of a surgical correction of cleft lip [Table/Fig-1a-c]. On intraoral examination, a mixed dentition with dental caries in 64 and a root stump in 65 were seen. There was underdevelopment of left half of the tongue and it deviated towards the left side during protrusion. The examination of the palate revealed a surgical scar which was suggestive of a surgery which had been done for cleft palate [Table/Fig-1d,e].

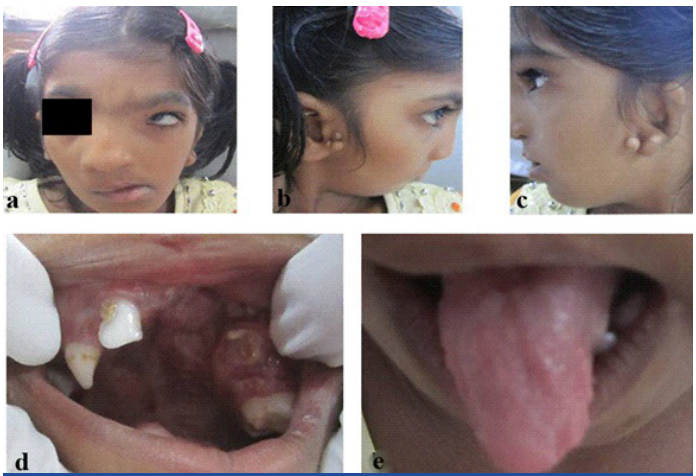
We subjected the patient to further radiological investigations, where OPG revealed a hypoplastic mandible on the left side, with a cleft in the left maxilla. A lateral cephalogram revealed mid face hypoplasia and PA of skull revealed hypoplasia on the left side of the face [Table/Fig-2a,b]. PA view of vertebrae revealed no abnormalities. CT [Table/Fig-2c,d] of the skull also confirmed the diagnosis of cleft palate with hypoplasia of the left side of the face. Based on the clinical and radiological features, we made a diagnosis of Goldenhar syndrome.

CASE REPORT 2

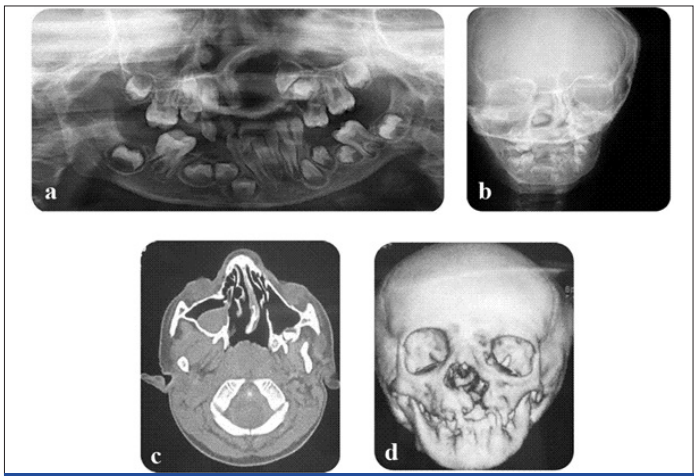
An eight-year-old male patient came to our Department of Oral Medicine and Radiology with the complaint of deviation of mouth towards the right side on opening. His medical history was not contributory. The patient's parents were not related to each other and he had no sibling.

On general examination, the patient was found to have no systemic disease and his IQ for his age was normal. On extra oral examination, facial asymmetry with hypoplasia of the right side of the face was seen. Coloboma was seen in both the eyes. Macrostomia was present. There was an accessory tragus on both sides of the ear [Table/Fig-3a-d]. On intraoral examination, a mixed dentition was seen. There was excessive extension of the commisure on the right side. There was mild deviation of the tongue towards the right side.

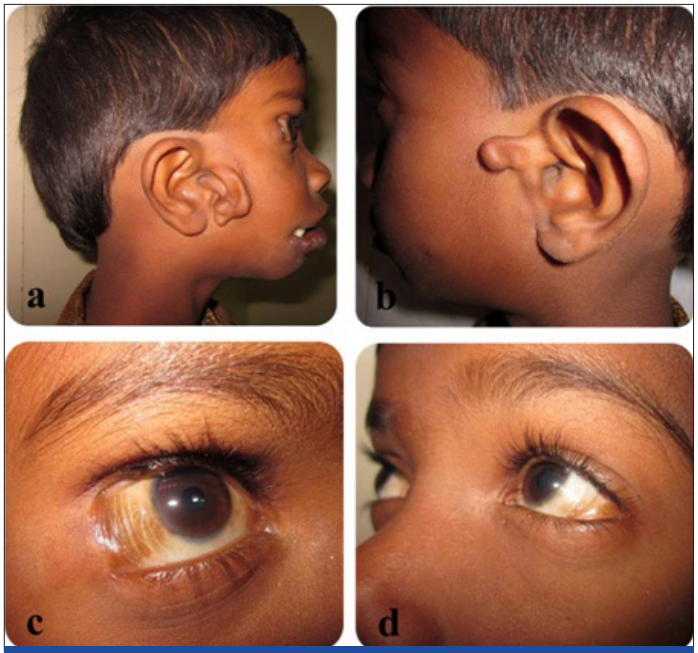
We subjected the patient to further radiological investigations, where OPG revealed a hypoplastic mandible on the right side, with absence of condyle and coronoid process. A lateral cephalogram revealed mid face hypoplasia and PA of skull revealed hypoplasia of the right side of the face [Table/Fig-4a-c]. PA of vertebrae revealed no abnormalities. Based on the clinical and radiological features, we made a diagnosis of Goldenhar syndrome. The comparison of the clinical features of the two cases has been shown in [Table/Fig-5].



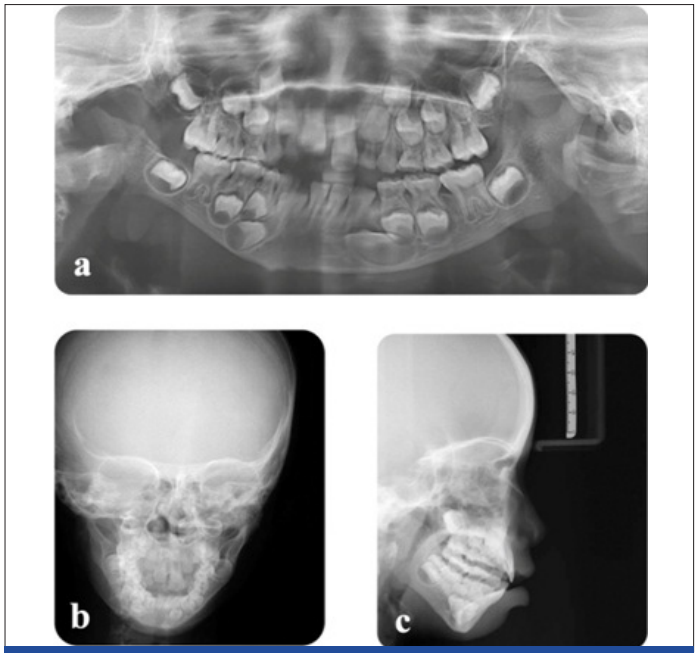
[Table/Fig-1a-e]: Case 1 clinical picture



[Table/Fig-2a-d]: Case 1 radiological picture



[Table/Fig-3a-d]: Case 2 clinical picture



[Table/Fig-4a-c]: Case 2 radiological picture

Features	Case 1	Case 2
Hemifacial hypoplasia	+	+
Mid face hypoplasia	+	+
Micropthalmia	+	_
Occular dermoid	_	_
Coloboma	_	+
Accessory tragi	+	+
Microtia	+	+
Cleft lip and palate	+	_
Vertebral abnormalities	_	_
Systemic abnormalities	_	_

[Table/Fig-5]: Comparision of the clinical features in the two cases

DISCUSSION

Facio-auriculo vertebral syndrome was first recorded by a German physician, Carl Ferinand Von Arit [1]. Goldenhar described a patient with a triad of accessory tragie, mandibular hypoplasia and ocular (epibulbar) dermoids and called this constellation of features, the Goldenhar syndrome. Gorlin et al., named this syndrome, oculo-auriculo-vertebral dysplasia, due to the presence of additional vertebral anomalies [2]. Goldenhar's syndrome is a rare, presumably inherited condition, which has a multifactorial aetiopathology that also includes nutritional and environmental factors that can result in disturbances of blastogenesis.

The incidence of Goldenhar syndrome has been reported to be between 1:35000 to 1: 56000, with a male: female ratio of 3:2. Its incidence is higher in children with congenital deafness i.e. about 1:1000. The exact aetiology is not known. However, it is possible that the abnormal embryonic vascular supply, distrupted mesodermal migration or some other factor leads to defective formation of the branchial arches and vertebral systems [3]. Kallen et al., reported that most of the cases were sporadic. Autosomal dominant, autosomal recessive and multifactorial modes of inheritance have also been suggested. Chromosomal studies did not reveal any abnormality [4].

Etiology

Ingestion of drugs such as thalidomide, retinoic acid, tamoxifen, and cocaine by pregnant mothers may be related to the development of this syndrome. Maternal diabetes, rubella and influenza have also been suggested as aetiologic factors [3,5,6]. Heavy alcohol consumption during pregnancy is also one of the aetiologies of this syndrome [7]. Mounoud et al., reported a case with this syndrome, which had a history of vitamin A intoxication of the mother. A daily dose of 25000 IU of vitamin A produces a teratogenic effect. This teratogen produces ill effects on neural crest cell formations, which are essential for the formation of pharyngeal arches [8,9]. In the present case, there was no history of any maternal drug intake, any febrile illness or diabetes which had occurred during pregnancy.

Diagnosis

The classic features of this syndrome include ocular changes such as micropthalmia, epibulbar dermoids, lipodermoids and coloboma; aural features such as preauricular tragic, hearing loss and microtia; and vertebral anomalies such as scoliosis, hemivertebrae and cervical fusion [10]. The abnormalities have been found to be unilateral in 85% of the cases and to be bilateral in 10-33% cases. In Goldenhar syndrome, ocular anomalies, especially bilateral dermoids, are seen in 60% of the cases, vertebral anomalies are seen in 40% of the cases and ear anomalies are seen in 40% of the cases [11].

Other systemic features are found in about 50% of the patients. Tetralogy of Fallot and ventricular septal defects are the most common cardiovascular anomalies which are associated with OAVS [12] Cleft lip and palate, macrostomia, micrognathia, webbing of the neck, a short neck, tracheoesophagial fistulas, abnormalities of sternocleidomastoid muscle, umbilical hernia, inguinal hernia, urologic anomalies, a hypoplastic vagina and anal anomalies may be associated. Anopthalmos, facial palsy, calcification of falx cerebri, undescented testes, and association of Goldenhar syndrome with Turner's syndrome and glaucoma are the rare reported associations.

Diffrential diagnosis

Other syndromes associated with multiple preauricular tags include Treacher – Collins syndrome, Wolf – Hirschhorn syndrome (cervicooculoacoustic syndrome), Townes-Brocks syndrome and Delleman syndrome. Treacher Collin syndrome is associated with maxillary and mandibular hypoplasia, but it is not associated with ocular and aural anomalies [3].

Management

In uncomplicated cases, the treatment of the syndrome varies with age and systemic associations and it is mainly cosmetic. In patients with mandibular hypoplasia, reconstructions can be done by using rib bone grafts and an underdeveloped maxilla can be lengthened by bone distraction osteogenesis. Surgical corrections for cleft lip

and palate can be done, followed by an orthodontic correction after jaw growth completion. Reconstruction surgeries of the external ear may be performed at the age of 6 to 8 years. In patients with milder involvements, jaw reconstruction surgeries can be done in the early teens; epibulbar dermoids should be surgically excised. Structural anomalies of the eyes and ears can be corrected by plastic surgery. Children with this syndrome have an increased risk for psychosocial difficulties. Social workers can provide support and guidance to the children and their families, such as accessing community resources, making decisions about surgeries and adjusting for the facial asymmetry. Prognosis of this disease is good in otherwise uncomplicated cases without any systemic associations [3].

Severe cases of Goldenhar syndrome or hemifacial microsomia can affect many aspects of the patients' lives and they sometimes requires immediate interventions from birth. For example, the patient may suffer from severe obstructive sleep apnoea caused by airway abnormalities. Jaw problems may result in a restrictive diet and malnutrition, and issues with the eyelids may lead to subsequent vision problems. Without hearing assistance or surgical reconstructions, individuals with full bilateral microtia and atresia will develop permanent deaf mutism [13]. Renal ultrasounds and ultrasounds of the heart may also be recommended, due to the increased risk for birth defects in these areas [14].

REFERENCES

[1] Gorlin RJ, Cohen MM, Levin LS. Syndromes of the head and neck. NewYork: Oxford University press; 1990. p. 707-8.
[2] Gorlin RJ, Jue KL, Lacobsen Ull, Goldschmidt E: Oculoauriculovertebral dysplasia. *J Pediatr.* 1963; 63: 991–99.
[3] Bijal Mehta, Chitra Nayak, Shankar Savant et al. Goldenhar syndrome with unusal features. *Indian J Venerol Dermatol Leprol.* May-June 2008; 74(3) :254-56.
[4] Kallen K, Robert E, Castilla EE, Mastroiacovo P, Kallen B. Relation between oculo-auriculo-vertebral (OAV) dysplasia and three other non-random associations of malformations (VATER, CHARGE, and OEIS). *Am J Med Genet.* 2004;127A:26-34.
[5] Mehta B, Nayak C, Savant S, Amladi S. Goldenhar syndrome with unusual features. *Indian J Dermatol Venereol Leprol.* 2008;74:254-6.
[6] Nakajima H, Goto G Tanaka N, Ashiya H, Ibukiyama C. Goldenhar Syndrome associated with various cardiovascular malformations. *Jpn Circ J.* 1998;62:617-20.
[7] Amitava Das, MS; Biswarup Ray, MS; Debarbrata Das MS. A Case of Goldenhar-Gorlin syndrome with unusual association of hypoplastic thumb. *Indian J Ophthamol.* 2008; 56: 150-2.
[8] Mounoud RL, Klein D, Weber F. A case of Goldenhar syndrome: Acute vitamin A intoxication in the mother during pregnancy. *J Genet Hum*. 1975;23:135–54.
[9] Maj V Mathur, Lt Col RK Mishra. Golden-har syndrome. *Mjafi*. 2000; 56 : 231-32.
[10] Bruno Bissonnette, Igor Luginbuehl Bruno Marciniak, Bernard Dalens. Syndromes - Rapid Recognition and Perioperative Implications. Ist Edition (2006): Mc Graw-Hill Companies.
[11] Hitoshi Nakajima, MD; Giichi Goto, MD; Nobuhiro Tanaka, MD; Hiroaki Ashiya, MD; Chiharu Ibukiyama, MD. Goldenhar Syndrome Associated With Various Cardiovascular Malformations. *Jpn Circ J.* 1998; 62: 617 –20.
[12] Martha M. Werler, Sc.D., Jacqueline R. Starr, Ph.D., Yona K. Cloonan, Ph.D., et al. Hemifacial microsomia: From gestation to childhood. *J Craniofac Surg*. 2009 March ; 20(Suppl 1): 664–69.
[13] Sudarshan P Gaurkar, Khushboo D Gupta, Kirti S Parmar, Bela J Shah. Goldenhar Syndrome: A Report of 3 Cases. *Indian J Dermatol*. 2013; 58(3): 244.
[14] Neeraj Sharma, Sidhi Passi. Goldenhar syndrome. *Indian J Dent Res*. 2013; 24: 49.

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