Case Report

Goldenhar Syndrome: A rare case report

Ruchi Bhuyan, Abhishek Ranjan Pati[1], Sanat Kumar Bhuyan[1], Bikash Bishwadarshee Nayak[1]

Departments of Oral Pathology and Microbiology and [1]Oral Medicine and Radiology, Siksha O Anusandhan University, Khandagiri, Bhubaneswar, Odisha, India

Abstract

Goldenhar Syndrome or oculoauriculovertebral spectrum is a complex syndrome characterized by an association of maxillomandibular hypoplasia, deformity of the ear, ocular dermoid and vertebral anomalies and the most severe form of hemifacial microsomia. Here, we describe a 26-year-old male patient with unilateral hemifacial microsomia, preauricular ear tags, macrosomia on the right side of the face.

Key Words: Hemifacial microsomia, ocular dermoid, preauricular ear tags

Address for correspondence:
Dr. Abhishek Ranjan Pati, HIG 413-A, K-5 Kalinga Vihar, Patrapada, Bhubaneswar - 751 019, Odisha, India. E-mail: patiabhi@gmail.com
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INTRODUCTION

In 1881, the first observation of oculo-auriculo-vertebral (OAV) dysplasia was reported by Von Arlt[1] and in 1952, Dr. Maurice Goldenhar, a renowned Swiss ophthalmologist classified the clinical features and named the malformation complex as Goldenhar Syndrome and described it as a congenital defect characterized by constellation of malformations classically involving the face, eyes and ears.[2]

In 1960, Gorlin and Pindborg noted that the disorder varied from mild to severe and the facial involvement occurred unilaterally as well as bilaterally. In 1963, Gorlin *et al*. suggested the use of the term oculoauricularvertebral dysplasia to describe the syndrome characterized by epibulbar dermoids, auricular appendages, blind-ended auricular fistulas and vertebral anomalies.[3] They considered this syndrome to be a variant of this complex.

It is otherwise known as oculoauriculovertebral syndrome, hemifacial microsomia, first arch syndrome, first and second branchial arch syndrome, Goldenhar–Gorlin Syndrome, lateral facial dysplasia, unilateral craniofacial microsomia, otomandibular dysostosis, unilateral intrauterine facial necrosis and auriculo-branchiogenic dysplasia., Facio-auricular dysplasias represent a single disorder with great variability of expression and an isolated ear malformation may represent the mildest expression of the disorder.[4]

Abnormalities are unilateral in 85% of cases and bilateral in 10–33% of the cases and the right side is more frequently affected.[5] The incidence of Goldenhar Syndrome has been reported to be varying from 1:3500 to 1:5600 live births and it is present in 1:1000 children with congenital deafness with a male to female ratio of 3:2.[6] The disease is seen as sporadic and its etiology is not fully understood; however, positive family histories have been reported suggesting autosomal dominant or recessive inheritance. Some researchers have suggested that multifactorial inheritance are caused by the interaction of many genes, possibly in combination with environmental factors.[7]

Patients with Goldenhar Syndrome may exhibit a wide range of anomalies as described in Table 1.[8-22]

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Table 1: Anomalies associated with Goldenhar Syndrome

Dentofacial abnormalities	Unilateral facial hypoplasia
	Facial bones
	Prominent forehead[8]
	Hypoplasia of the zygomatic area
	Maxillar and mandibular hypoplasia[9]
	Mouth
	Lateral facial cleft (unilateral macrostomia)[9]
	Facial paresis[10]
	Intraoral findings
	Cleft lip, cleft palate, tongue cleft, unilateral tongue hypoplasia[10]
	Gingival Hypertrophy[9,10]
Salivary glands	Aplasia of parotid gland[8]
Ear	Preauricular skin tags, fistulas and nodes[8]
	Preauricular dimples to imperforated external acoustic meatus, deafness[11]
	Posteriorly angulated ears[9,10]
	Pretragal anotia[12]
	Bilateral preauricular pits[13]
	Other external ear malformations - dysplasias and asymmetries
	Aplasias and atresias of the external meatus
	Middle and internal ear anomalies[13]
Eye	Epibulbar dermoid (unilateral/bilateral)[13,14]
	Hypertelorism, ptosis[14,15]
	Small eye with notched upper lid,[15] short palpebral fissures, hypoplasia of supraorbital ridges[11,13]
	Prominent eyes with cloudy corneas[13]
	Juvenile glaucoma[16]
	Bilateral epicanthal folds[13]
	Lipodermoidoid (mostly bilateral)[17]
	Colobomas of the upper eyelid iris, choroidea and retina[18,19]
	Other eye anomalies
	Antimongoloid palpebral fissures
	Anophthalmia
	Cataract
	Blepharophimosis[20]
Vertebral column anomalies	Atlas occipitalization
	Synostosis. hemivertebrae
	Fused vertebrae,
	Kyphoscoliosis
	Bifid spine[20]
	Butterfly vertebrae[11]
	Equinovarus deformity[10]
	Missing ribs
	Clinodactyly of the 5th fingers
	Short stubby fingers with ulnar deviation, hypoplastic distal phalanges.
	Club feet with prominent heel[13]
Other systemic abnormalities	Rib anomalies and anomalies of the extremities
	Congenital heart disease (ventricular septal defect, atrial septal defect, pulmonary stenosis)[20]
	Growth retardation, marked hair on body,[11] torticollis,[21] upturned nose,[22] flat nasal bridge with broad nasal root,[13] deep creases on the feet[11]
	Severe respiratory distress due to upper respiratory tract infection, tracheoesophageal fistulas[10,13]
	Urogenital and gastrointestinal system: ectopic kidneys[20]
	Uretropelvic junction obstruction, imperforate anus
	Central nervous system occipital encephalocele[20]
	Anomalies of the larynx and lungs tracheoesophageal fistula esophageal atresia
	Retardation of mental development[20]

CASE REPORT

A 25-year-old male patient reported to the Department of Oral Medicine and Radiology with the chief complaint of malalignment of teeth since childhood. History revealed that the patient had difficulty in hearing from the left ear since childhood.

On extra-oral examination, a transverse cleft was present in right angle of mouth, with preauricular tissue tags and incompetent lips. Bilateral asymmetry of face and macrostomia was present and inter-incisal distance was 43 mm. On intraoral examination, 16 and 47 were missing with spacing between 11 12 13 14 42 43 44, proclined 11 12 13 43, cross bite in relation to 24 34, increased overjet and high arched palate [Figures 1-5].

Correlating the history and clinical findings a provisional diagnosis of hemifacial microsomia was given. Differential diagnosis of Goldenhar Syndrome was considered but could be difficult because of the variety of clinical signs. Collins and

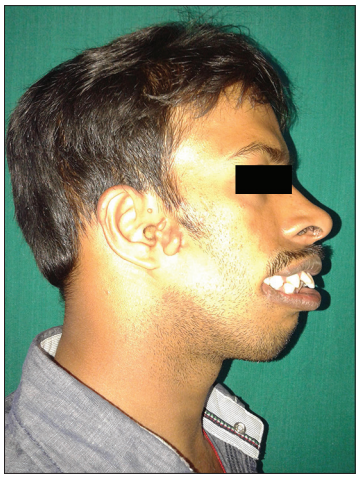

Figure 1: Lateral profile view of the patient showing preauricular skin tags, nodes and unilateral macrosomia

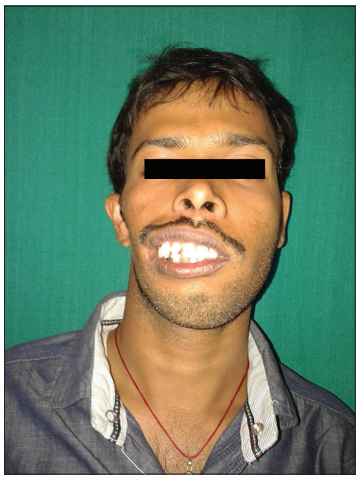

Figure 3: Front view demonstrating unilateral macrosomia, hypoplasia of the zygomatic area

Wildervanck Syndrome (*Syndroma cervicoocuioacusticum*) must also be distinguished. Goldenhar Syndrome can be classified as a variant of hemifacial microsomia, OAV spectrum, or OAV Dysplasia by some authors.[20]

Other craniofacial anomalies such as Treachers Collin's Syndrome, mandibulofacial dysostosis,[23] Miller Syndrome, a very rare genetic condition, often referred to as "postaxial acrofacial dysostosis" must also be ruled out. These disorders are characterized by distinctive craniofacial malformations that occur in association with limb abnormalities.[24]

Investigations were done where OPG revealed reduction in size of body of mandible, condyles, coronoid process and ramus on the right side. The border of the mandible was well defined and intact. The trabecular pattern and the course of mandibular canal were normal with normal surrounding structures. PA view of skull was taken to rule out any developmental anomaly. It revealed reduction in size of body of mandible, condyles,

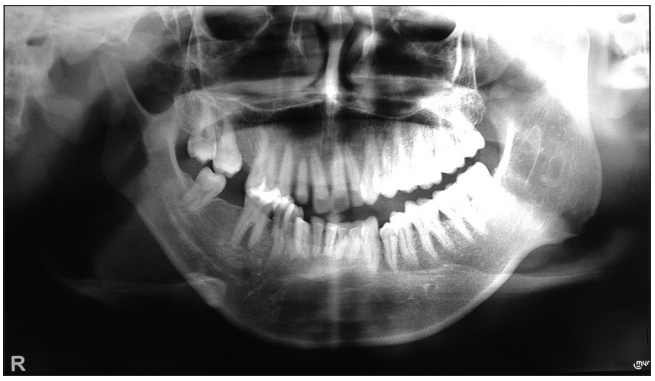

Figure 2: Orthopantomogram showing underdeveloped mandible on the right side

Figure 4: Medial aspect of eye demonstrating epibulbar dermoid

coronoid process and ramus on the right side of mandible with normal surrounding structures. Lateral cephalogram was taken which revealed proclined maxillary incisors with increased overjet. Impedance Audiometry revealed hearing sensitivity of right ear to be in normal range whereas severe loss of hearing was noted in left ear. Consultation with the Ophthalmologist was done, who suggested normal eye morphology with no abnormality. Ultrasonography of abdomen was done which revealed no abnormality.

Correlating the history, clinical findings and investigative findings a final diagnosis of Goldenhar Syndrome was given.

The patient was then referred to the Department of Orthodontics for his orthodontic treatment, where orthodontic brackets were fixed on his maxillary teeth with nickel-titanium wire [Figure 6].

DISCUSSION

Most of the patients reported within the OAV spectrum, a term proposed by Gorlin *et al*. (1990), are sporadic.[3] As similar to previously reported cases, our patient had marked right facial hypoplasia with the chin slightly deviated to the affected side.

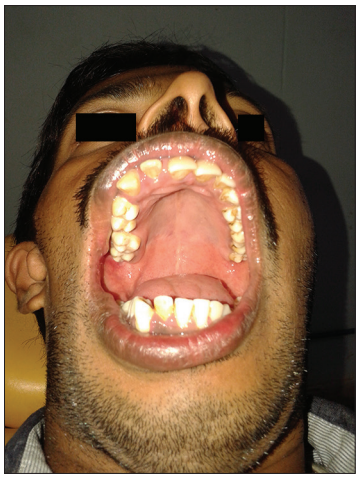

Figure 5: Intra-oral view showing high-arched palate

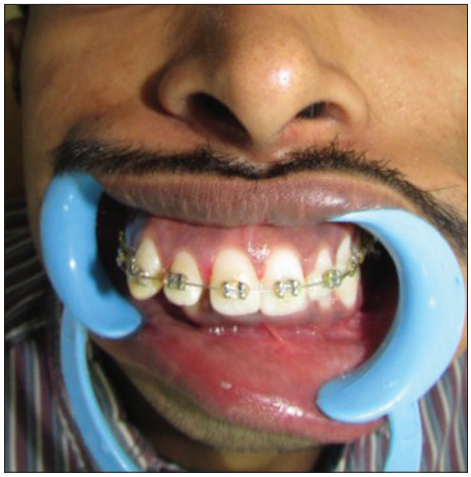

Figure 6: Patient started with orthodontic alignment

The association of epibulbar dermoids, preauricular fistulae, abnormalities of skin appendages and ocular malformations as a specific entity involving the first and second branchial arches was recognized by Goldenhar.[2] Pretragal fistulae, epibulbar dermoids and accessory auricular appendages are triad of Goldenhar Syndrome. The diagnosis is further substantiated if vertebral anomalies are present in addition to the triad. The diagnosis becomes more difficult if additional symptoms are present.

Cranial nerve involvement has been considered part of the OAV spectrum and the facial nerve involvement is cited most commonly.[25] Congenital ophthalmoplegia associated with Goldenhar Syndrome was reported in only one instance, concerning two patients with paralysis of one or more extraocular eye movements on neurologic examination. A third patient presented with unilateral agenesis of trochlear and abducens nerves and corresponding brain stem nuclei demonstrated at autopsy.[26] Brain stem involvement detected by magnetic resonance imaging in patients with Goldenhar Syndrome has been also reported; however, the stem lesions are very severe, resulting in a poor general prognosis.[27]

Some other etiologic factors include maternal vasoactive medication use (especially in conjunction with smoking) in the first 10 weeks of gestation, primidone, retinoic acid and thalidomide embryopathy and maternal (preexisting or gestational) diabetic embryopathy.[28]

In the 2nd month of embryonic development, aberrant fusion of the lateral portions of the maxillary and mandibular swellings results in macrostomia, usually associated with skin tags and pits between the comer of the mouth and the tragus.[29]

The prevalence of Goldenhar Syndrome in Indian population is very low. A study was taken up to understand the prevalence of this syndrome in children below the age of 14 years with hearing loss. Out of 1073 children, this syndrome was observed only in 1 (0.09%) case.[30]

The effect of Goldenhar Syndrome is more evident as the child grows, because of delays in the growth and the development of the affected areas. The lack of development of the jaws can cause breathing problems, as well as dental malocclusion which requires multidisciplinary approach.[5] Timing of the reconstruction plays an important role in the treatment. Primary reconstruction typically consists of a cleft repair, corrections of colobomas and ear deformities and removal of dermoids and preauricular tags. [31] The complex treatment is focused not only on dental care, articulation and hearing but also on the prevention and treatment of the psychosocial aspects of the malformation. Treatment requires constant follow-up and reassessment of the results.[23]

The study of this condition is still controversial because the symptoms and the physical features may vary greatly in range and severity from case to case.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. von Arlt F. Clinical presentation of diseases of the eye. 1st ed. Vienna: Braumuller publications; 1881.
2. Goldenhar M. Associated malformations of eye and ear, particularly dermoid syndrome epibulbar-appendices, congenital auricular fistulas and its relations with Manibulofacial Dysostosis J Genet Hum 1952;1:243-82.
3. Gorlin RJ, Jue KL, Jacobsen U, Goldschmidt E. Oculoauriculovertebral dysplasia. J Pediatr 1963;63:991-9.
4. Santos DT, Miyazaki O, Cavalcanti MG. Clinical-embryological and radiological correlations of oculo-auriculo-vertebral spectrum using 3D-CT. Dentomaxillofac Radiol 2003;32:8-14.
5. Bielicka B, Necka A, Andrych M. Interdisciplinary treatment of patients with Goldenhar Syndrome – Clinical reports. Dent Med Probl 2006;43:458-62.
6. Tuna EB, Orino D, Ogawa K, Yildirim M, Seymen F, Gencay K, *et al.* Craniofacial and dental characteristics of Goldenhar Syndrome: A report of two cases. J Oral Sci 2011;53:121-4.
7. Kulkarni V, Shah MD, Parikh A. Goldenhar Syndrome (a case report). J Postgrad Med 1985;31:177-9.
8. Jena AK, Duggal R. Atypical goldenhar syndrome: A case report. J Clin Pediatr Dent 2006;31:118-22.
9. Stoll C, Viville B, Treisser A, Gasser B. A family with dominant oculoauriculovertebral spectrum. Am J Med Genet 1998;78:345-9.
10. Setzer ES, Ruiz-Castaneda N, Severn C, Ryden S, Frias JL. Etiologic heterogeneity in the oculoauriculovertebral syndrome. J Pediatr 1981;98:88-90.
11. Ryan CA, Finer NN, Ives E. Discordance of signs in monozygotic twins concordant for the Goldenhar anomaly. Am J Med Genet 1988;29:755-61.
12. Pinheiro AL, Araújo LC, Oliveira SB, Sampaio MC, Freitas AC. Goldenhar's syndrome – Case report. Braz Dent J 2003;14:67-70.
13. Kobrynski L, Chitayat D, Zahed L, McGregor D, Rochon L, Brownstein S, *et al.* Trisomy 22 and facioauriculovertebral (Goldenhar) sequence. Am J Med Genet 1993;46:68-71.
14. Proto F, Scullica L. Contribution to the study of the heredity of epibulbar dermoids. Acta Genet Med Gemellol (Roma) 1966;15:351-63.
15. Wilson GN. Cranial defects in the Goldenhar syndrome. Am J Med Genet 1983;14:435-43.
16. Rao VA, Kaliaperumal S, Subramanyan T, Rao KR, Bhargavan R. Goldenhar syndrome's sequences in associated juvenile glaucoma in Turners syndrome. Indian J Ophthal 2005;53:267-8.
17. Waardenburg PJ, Franceschetti A, Klein D. Genetic and Ophthalmology. Vol. 1. Assen: Van Gorcum; 1961. p. 282.
18. Sinha PN, Mishra S. Corneal dermoid; report of a case. Am J Ophthalmol 1950;33:1137-41.
19. Ballantyne AJ. A case showing multiple congenital abnormalities. Proc R Soc Med 1933;26:313-5.
20. Kokavec R. Goldenhar syndrome with various clinical manifestations. Cleft Palate Craniofac J 2006;43:628-34.
21. Van Meter TD, Weaver DD. Oculo-auriculo-vertebral spectrum and the CHARG association: Clinical evidence for a common pathogenetic mechanism. Clin Dysmorphol 1996;5:187-96.
22. Boles DJ, Bodurtha J, Nance WE. Goldenhar complex in discordant monozygotic twins: A case report and review of the literature. Am J Med Genet 1987;28:103-9.
23. Tewfik TL. Manifestations of Craniofacial Syndromes; 20 April, 2015. Available from: http://www.emedicine.medscape.com/article/844209-overview. [Last retrieved on 2016 May 05].
24. Urs AB, Kumar P, Nunia K. Orodental findings in postaxial acrofacial dysostosis. J Oral Maxillofac Pathol 2014;18:149.
25. Gorlin RJ, Cohen MM Jr., Hennekam RC. Syndrome of the Head and Neck. 4th ed. New York: Oxford University Press; 2001.
26. Aleksic S, Budzilovich G, Choy A, Reuben R, Randt C, Finegold M, *et al.* Congenital ophthalmoplegia in oculoauriculovertebral dysplasia-hemifacial microsomia (Goldenhar-Gorlin syndrome). A clinicopathologic study and review of the literature. Neurology 1976;26:638-44.
27. Pane M, Baranello G, Battaglia D, Donvito V, Carnevale F, Stefanini MC, *et al.* Severe abnormalities of the pons in two infants with goldenhar syndrome. Neuropediatrics 2004;35:234-8.
28. Hartsfield JK. Review of the etiologic heterogeneity of the oculo-auriculo-vertebral spectrum (hemifacial microsomia). Orthod Craniofac Res 2007;10:121-8.
29. Larsen WJ. Human Embryology. New York: Churchill Livingstone; 1993.
30. Reddy MV, Reddy PP, Rani UP, Bindu HL. Facio-auricular vertebral syndrome – A case report. Indian J Hum Genet 2005;11:156-8.
31. Volpe P, Gentile M. Three-dimensional diagnosis of Goldenhar syndrome. Ultrasound Obstet Gynecol 2004;24:798-800.