Gorlin-Goltz Syndrome, an Incidental Finding: A Rare Case Report

Sanyasi Gandhiraj

ABSTRACT

Gorlin-Goltz syndrome is an uncommonly found rare disease which shows various possible diverse manifestations of multisystem anomalies, high degree penetration rate with variable expressiveness at least on three body systems. Cutaneous, skeletal, ophthalmological, neurological and reproductive systems are commonly affected in this syndrome. Multiple keratocysts of the jaws are the frequently developed early abnormality than any other. Hereditary autosomal dominant trait is explained as the causative factor for the development of the syndrome. In this case two major and seven minor anomalies were registered. The anomalies found in the patient were not categorized as serious life-threatening abnormalities excepting the multiple keratocysts which were treated by enucleation, curettage and Carnoy’s solution application. An incidental detection of Gorlin-Goltz syndrome with multisystem anomalies of a 14-year-old female patient, who had reported for the swelling in the left body of the mandible, is described in this article.

Keywords: Gorlin-Goltz syndrome, Palmar pits, Multiple keratocysts, Metatarsal abnormalities, Enucleation, Curettage and Carnoy’s solution application.

How to cite this article: Gandhiraj S. Gorlin-Goltz Syndrome, an Incidental Finding: A Rare Case Report. J Indian Acad Oral Med Radiol 2012;24(3):232-235.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

Incidence of Gorlin-Goltz syndrome among the population is one in 50,000 to 1,50,000, but variable ratios were reported for the western population which range from one in 57,000 to 2,56,000 and a common range of one in 60,000 is widely accepted. Autosomal dominant trait is explained as the etiologic factor for the development of this syndrome. The syndrome shows high degree penetration rate and variable expressiveness at least on three body systems. Different names have been attributed to this syndrome namely, nevoid basal cell carcinoma, basal cell epithelioma, jaw cyst bifid rib syndrome and Gorlin-Goltz syndrome. Aberrant activation of the hedgehog pathway has been implicated in the genesis and progression of human cancers including basal cell carcinoma and medullo-blastoma. The syndrome develops due to a genetic mutation in the patched tumor suppressor gene (PTCH) located in the 9q 22-3 chromosomes. This gene is composed of transmembrane glucoprotein of 1,447 amino acids and 12 domains, and this protein is present in the hedgehog signaling pathway. This pathway is responsible for embryogenesis, homeostasis maintenance and tissue repair. When hedgehog is absent the PTCH transmembrane receptors inhibit the protein that emits smoothened signals (SMO). When hedgehog combines with PTCH the SMO signals are released, causing activation of certain genes which in turn produces tumor. The syndrome was first described by Jarisch and White in 1894 in which they have mentioned about the presence of basal cell carcinoma as the major anomaly. Strait in 1939 explained the existence of cystic lesions of jaws in addition to nevoid basal cell carcinomas. Gross in 1953 reported the additional features of bilateral bifurcation of sixth rib and synostosis of the first rib. Bettley and Ward reported the presence of palmar and plantar pits with the syndrome. But Gorlin and Goltz established a classical triad which includes multiple basal cell epithelioma, keratocyst of jaws, bifid ribs that characterize the diagnosis of the syndrome. Rayner et al explained that the keratocyst has to appear in combination with calcification of falx cerebri and palmar or plantar pits. But a clear and refined report was documented by Kimoni et al in the year 1997 who established and streamlined the anomalies as the major and minor criterias for diagnostic purpose and according to Kimoni’s protocol the disease can be diagnosed as Gorlin-Goltz syndrome if two major criterias or one major criteria with two minor criterias are present. More than 100 minor criterias of multiple systems were documented so far. Presence of multisystem anomalies in patients who have keratocysts, are found in less than 10% of the cases only. Very often the keratocysts of the jaws manifest early, as the first sign, before the manifestation of other anomalies even in less than 10 years of age and this type of disease presentation are commonly seen in 90% of the syndromic patients. The peak incidence is seen in 2nd to 3rd decade, but occurrence in children are not uncommon. The male to female ratio for those who are not having nevoid basal cell carcinomas are 1:0.62 but it varies to 1:1.22 among patients with nevoid basal cell carcinoma but an equal distribution among people are accepted by everyone. Keratocyst involvement are more predominantly seen in mandible, in which the ramus part of the mandible (43%) are affected more commonly followed by the anterior region (18%) and the premolar region (7%). In the maxilla, anterior regions are more involved (14%) than the posterior (12%) and the premolar
The frequently occurring multisystem anomalies are shown here.

**Cutaneous System Anomalies**
Basal cell carcinoma, palmar and plantar pits, palmar plantar keratosis, dermal calcification, benign dermoid cyst and tumor.

**Skeletal System Anomalies**
Multiple keratocysts, cleft palate, bifid rib anomaly, vertebral anomaly, brachy metacarpals, wide nasal bridge, mandible prognathism.

**Ophthalmologic System Anomalies**
Hypertelorism, glaucoma, chalazion, ptosis, congenital blindness, strabismus, raised eye brows, cataract, coloboma, microphthalmus.

**Neurologic System Anomalies**
Mental retardation, dural calcification, agenesis of corpus callosum, medulloblastoma, calcification of fox cerebri.

**Reproductive System Anomalies**
Hypogonadism, gynecomastia, sparse beard, ovarian fibrosarcoma, calcified ovarian cyst, irregular menstrual cycle.

**KIMONI’S PROTOCOL**

**Kimoni’s Major Criterias**
More than two basal cell carcinomas or one basal cell carcinoma at younger than 30 years of age or more than 10 basal cell nevus; Multiple odontogenic keratocysts (proved histological) or polyostotic bone cysts; Three or more palmar or plantar pits (seen in 65% of patients); Ectopic calcification, lamellar calcification at younger than 20 years of age; Calcification of falx cerebri, tentorium cerebellum; Positive family history of nevoid basal cell carcinoma.

**Kimoni’s Minor Criterias**
Congenital skeletal abnormalities like fused, splayed, missing and bifid ribs, kyphoscoliosis, wedged or fused vertebras, occipitofrontal circumference more than 97%, frontal, parietal bossing, ovarian fibroma, lymphoma mesenteric cyst, low pitch voice in female, hypogonadism, renal anomaly, medulloblastoma, cardiac fibroma, fibrosarcoma, rhabdomyosarcoma, congenital malformation like cleft lip, cleft palate, polydactylism, high arched eye brows, narrow sloping shoulder, immobile thumb, eye abnormalities like cataract, coloboma, microphthalmus.

**Orofacial Anomalies**
- Multiple odontogenic keratocysts of jaws
- Multiple impacted teeth, high arched palate
- Cleft palate, cleft lip
- Fibroma, sarcoma of jaws
- Fibroma of palate and sinus
- Malocclusion, mandible prognathism
- Ameloblastoma.

Based on the existence of two major criterias namely multiple odontogenic keratocysts of the lower and upper jaws, the palmar pits and seven minor criterias namely raised eyebrows, hypertelorism, broadened nasal bridge, low occiput, frontal bossing, metatarsal deformities and coarse face the diagnosis was made as Gorlin-Goltz syndrome.

**MATERIALS AND METHODS**
Patient complained about a mild swelling of the left body of the mandible and purulent intraoral discharge in the vestibule near 35 and 36 with the duration of 6 months (Fig. 1). Intraorally very minimal expansion in the buccal side from 32 to 37 region with no lingual expansion and missing first premolar and last molar were noticed. The aspirated material from the lesion was viscous and dirty white in appearance and the microscopic examination revealed the presence of keratin, and the protein content less than 4 mg/100 ml suggested the possibility of keratocyst. The orthopantomogram X-ray revealed an irregular scallop bordered radiolucency extending from 45 to 37 and unerupted 34 and 38 with distally displaced 35 (Fig. 2) and confirmed the provisional diagnosis. Maxillary cysts in relation with 22 to 27 with unerupted supernumerary, first premolar and last molar (Fig. 2) were also detected during the routine clinical examination and by radiological investigations. Though the patient had reported herself for the lower jaw swelling, the signs like multiple palmar pits,

**Fig. 1:** Coarse face, hypertelorism, wide nasal bridge, frontal bossing, high arched eye brows
(Fig. 3) the coarse face, frontal bossing, low occiput, raised eyebrow, hypertelorism, broadened nasal bridge, (Fig. 1) the metatarsal abnormalities, (Figs 4 and 5) the histopathological report of the cystic lesions (Fig. 6) drew the attention of the surgeon to contribute and correlate all these findings with Gorlin-Goltz syndrome. The case was referred to concern specialists (dermatologist, neurosurgeon, endocrinologist, gynecologist, orthopedic surgeon and nephrologists) for opinion and management regarding the already detected anomalies and for detecting further abnormalities if any present. But no further anomalies were detected by the general surgeons. The multiple anomalies detected early in this patient are listed as follows:

1. Multiple odontogenic keratocysts
2. Palmar pits
3. Raised eyebrows
4. Hypertelorism
5. Broad nasal bridge
6. Frontal bossing
7. Low occiput
8. Metatarsal deformities
9. Coarse face

Based on the two major and seven minor criterias detected, the disease was diagnosed as Gorlin-Goltz syndrome. Bimaxillary cysts were enucleated along with the unerupted teeth followed by vigorous curettage and with Carnoy’s solution application (Fig. 7). The patient was reviewed periodically once in 6 months by the oral surgeon and the general surgeons including the dermatologist, neurosurgeon and gynecologist for a period of 3 years. But a long-term follow-up for these patients for the entire life are mandatory. Early diagnosis, genetic counseling and advise for ultraviolet rays protection are the important steps to be remembered in the treatment process. The serious consequences of developing multiple basal cell carcinomas, and other neoplasms including medulloblastoma, meningioma in future were explained and the patient was also insisted to visit the clinic regularly for review. This may help in reducing the severity of the disease symptoms in future.
DISCUSSION

The syndrome is a rare entity and is very evident that the responsibility of the dental surgeon is very important in diagnosing the disease in advance, since the keratocysts of the jaws appeared as the early manifestation in majority of cases. When multiple keratocysts are encountered in patient adequate efforts are to be taken by the dental surgeon, to detect multisystem anomalies if any present with the patient, as a precautionary measure. As the syndrome exhibits the anomalies of various systems a multidisciplinary approach is necessary for the management of the diseases. Fortunately, in this case, no serious or life-threatening complications of the multisystem anomalies excepting the keratocysts were found. No active treatment was rendered to the patient for the other anomalies as they did not require treatment at that stage. But a long-term follow-up for the entire life are mandatory in the management of the syndrome. The future life-threatening consequences of multisystem anomalies and the high risk recurrence rate of keratocysts were informed and the patient was carefully reviewed by the different specialty doctors once in every 6 months for a period of 3 years which was asymptomatic.

SUMMARY AND CONCLUSION

Based on the existing major and minor anomalies found in the patient the diagnosis was made as Gorlin-Goltz syndrome. The patient was treated surgically by enucleation, vigorous curettage and Carnoy’s solution application. Possibility of developing serious future complications like multiple skin carcinomas, medulloblastoma, meningioma, intracranial calcifications, recurrent keratocysts and the importance of skin protection from sunlight and genetic advice were taught to the patient. As the patient is presented to the dental surgeon early than to any other doctors the responsibility of the dental surgeon is very important for early diagnosis without making further delay. Thus a rare entity, Gorlin-Goltz syndrome, was diagnosed and treated for one of its major anomaly whereas the other anomalies did not require active management at that stage. Periodical review for the whole life period is very essential for the patient.

REFERENCES


ABOUT THE AUTHOR

Sanyasi Gandhiraj
Professor, Department of Oral and Maxillofacial Surgery Sathyabama University Dental College and Hospital, Chennai Tamil Nadu, India, Phone: 044-26621737; 09840175515 e-mail: gandhigandhi836@yahoo.com