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Original paper

Gorlin-Goltz Syndrome Diagnosed Through Multiple Jaw Lesions, A Case Report

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Abstract

Background and Aim: Gorlin-Goltz syndrome (GGS), also known as nevoid basal cell carcinoma syndrome (NBCCS), is a rare multisystemic syndrome that can affect various of tissues and organs in the human body. Patients with this syndrome are at risk of developing basal cell skin cancer during puberty or early adulthood. Diagnosis of this syndrome is based on major and minor criteria. Early diagnosis and treatment of this syndrome is important to reduce the severity of complications including cutaneous and cerebral malignancy and oromaxillofacial deformation and destruction due to jaw cysts.

Method: A 27-year-old male with no significant medical history except abdominal herniation visited Shahid Beheshti Dental Clinic. Previous clinicians had failed to diagnose to come up with a solid diagnosis.

Results: On extraoral examination, ocular hypertelorism was noticed. Multiple cyst like lesions were seen in panoramic graphy.also several dark nevus could be found on different regions of his body which after examination were diagnosed as basal cell carcinoma. Surgical enucleation was performed to remove cysts.

Conclusion: This case suggests that rare diseases such as the presence of multiple BCCs require further research and a multidisciplinary approach, since a rare and life-threatening disease can be the cause. Early diagnosis of Gorlin syndrome is of paramount importance to allow an appropriate therapeutic approach recommended by a multidisciplinary team. Patients with multiple skin lesions should be evaluated regularly by a general practitioner or dermatologist.

Keywords: *Gorlin-Goltz syndrome, Nevoid basal cell carcinoma syndrome, Odontogenic keratocyst, Case reports, Rare Diseases*

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Introduction

Nevoid basal cell carcinoma syndrome (GGSS), also known as Gorlin syndrome, is a rare genetic disease. GGSS is an autosomal dominant disorder characterized by developmental defects and tumorigenesis [1].

Gorlin syndrome was mentioned several times in the medical literature, But It was first recognized in 1894 when Jarisch and White described the essential phenotypic features of the nevoid basal cell carcinoma syndrome [2], [3].

Almost a hundred years later, in 1960, Dr. Robert Gorlin (Professor of Oral Pathology, University of Minnesota School of Dentistry, US) and Dr. Robert Goltz (Clinical Assistant Professor of Dermatology, University of Minnesota Medical School, US) delineated the different clinical features in their paper on "multiple nevoid basal cell epithelioma, jaw cysts and bifid rib syndrome" [4].

It is characterized by the presence of multiple basal cell carcinomas (BCCs) on the skin, as well as numerous maxillary odontogenic keratocyte (QTOs), palmoplantar punctate depressions (pits), skeletal abnormalities, and other developmental defects. The genetic basis of this syndrome lies in causal mutations in the PTCH1 gene, a tumor suppressor gene located on chromosome 9 [5].

The first step of evaluation is to appropriately achieve a diagnosis. The main clinical features are basal cell carcinomas, odontogenic keratocysts, palmoplantar pits, calcification of the falx cerebri, medulloblastoma and first-degree relative with Gorlin Goltz syndrome. These six characteristics are considered the major clinical criteria for the diagnosis [6], [7].

Due to the syndrome's tendency to become aggressive and lead to development of malignant neoplasms, early diagnosis is the key factor to maximize survival rate of patients.

Here we present a case that had several different diagnosis and unsuccessful attempts by other clinicians but fortunately got diagnosed by Shahid Beheshti University of Medical Sciences, department of oral medicines.

Case Report

A 27-year-old male patient visited our clinic in order to get root canal therapy for several teeth. Previous clinicians had only ordered periapical radiography and noticed several cyst structures near root tips therefore considered them as a radicular cyst.

Patient had no significant medical history except abdominal herniation.

Following extraoral examination, ocular hypertelorism was noticed (Figure 1).

Intraoral examination revealed no sign of inflammation or pain in palpation (Figure 2).

Figure 1. Facial appearance of patient showed ocular hypertelorism.

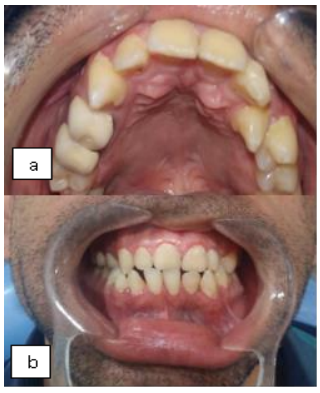

Figure 2. (a,b) Intra-oral clinical image shows no inflammation of oral tissue,

The patient's preoperative Orthopantomogram (OPG) revealed multiple radiolucent lesions on both sides of the maxilla and both sides and center of the mandible. Impacted third molar were present on both sides an impacted canine and was present on right side of mandible, deciduous canine was still present as well (Figure 3). Despite several radiolucent lesions, no swelling was present on the face and no expansion was present in the intraoral vestibules, and the extension of lesion was more evident that expansion this characteristic raised suspicion that mentioned lesions could be OKC.

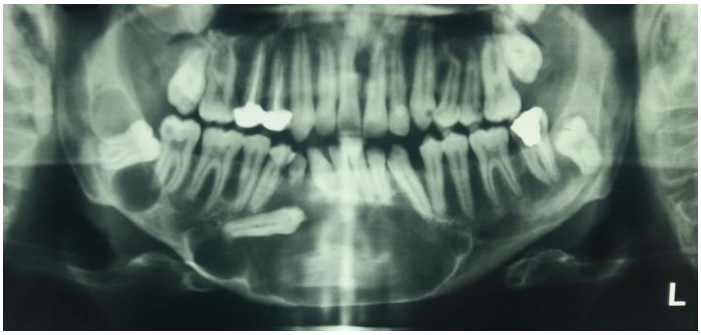

Figure 3. multiple radiolucent lesions can be seen in Orthopantomogram (OPG) in different regions of jaws

Owing to the presence of multiple cysts like lesions in the jaw, GGS was suspected and further investigations were carried out. On FNA, yellowish material was aspirated from cysts.
By further clinical assessments, multiple pigmented skin lesions were found in various regions of patient's skin, which was later diagnosed as basal cell carcinoma by laboratory tests (Figure 4).

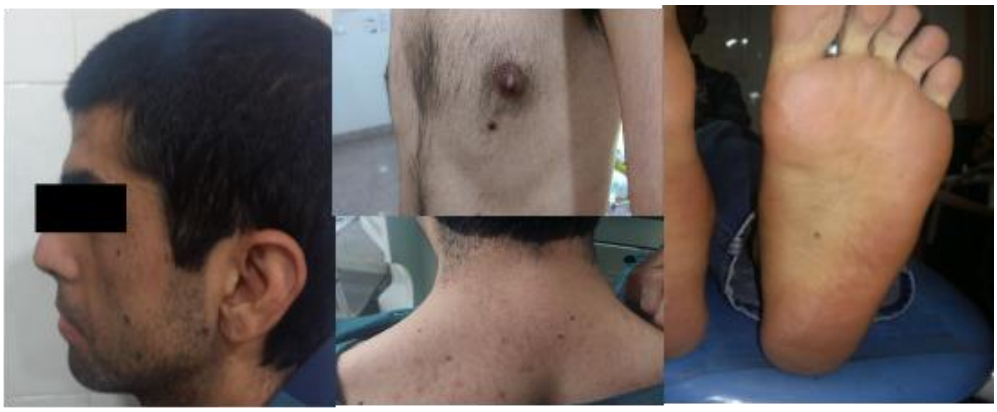

Figure 4. multiple pigmented skin lesions were found in various regions of patient's skin.

The presence of multiple cysts in the jaws and extra oral features and several BCCs on the skin, diagnosis of GGS was made.
The cyst enucleation was done under general anesthesia via intraoral approach (Figure 5).
The enucleated cystic lining was sent for histopathological examination. The histopathological examination confirmed the diagnosis of OKC. The patient is being followed up.

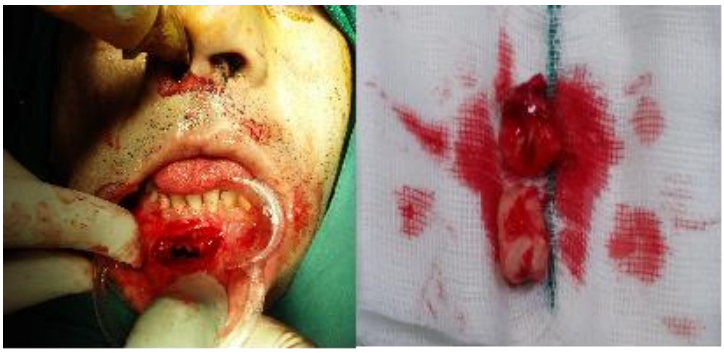

Figure 5. The cyst enucleation was done under general anesthesia via intraoral approach

Discussion

OKCs, which are relatively common in GGS, are diagnosed with dental panoramic radiography. Keratocysts may show a uni - or multilocular pattern and the cystic spaces may have a smooth or scalloped border.

Evans et al. [8] first established major and minor criteria for diagnosis of this rare entity, later modified by Kimonis et al. [7] According to them diagnosis of GGS can be established when two major or one major and two minor features are present (Table 1).

Table 1. Diagnosis of Gorlin-Goltz syndrome can be made in the presence of: a) 2 major criteria, b) 1 major criteria and molecular confirmation or c) 1 major and 2 minor criteria.

Major criteria	Minor criteria
1) More than two BCC, or one in patients aged <20 years	1) Macrocephaly determined after adjustment for height
2) Odontogenic keratocysts of the jaw on histology	2) Congenital malformations: cleft lip or palate, frontal bossing, “coarse face”, moderate or severe hypertelorism
3) Three or more palmar or plantar pits	3) Other skeletal abnormalities: Sprengel deformity, marked pectus deformity, marked syndactyly of the digits
4) Bilamellar calcification of the falx cerebri	4) Radiological abnormalities: Bridging of the sella turcica, vertebral anomalies such as hemivertebrae, fusion or elongation of the vertebral bodies, modeling defects of the hands and feet, or flame-shaped lucencies of the hands or feet
5) First-degree relative with GGS syndrome	5) Ovarian fibroma
6) Bifid, fused or markedly splayed ribs	6) Medulloblastoma

Our patient had two major features and minor hypertelorism was present which is a minor feature. With further investigation on familial history, patient stated that he has a nephew which looks slightly like him, hence he was examined and multiple OKCs were detected, no BCC was present on his skin at that time.

Diagnosis of GGS may be difficult because of the variability of expressivity and because of different ages of onset for the different traits of this disorder [9].
Early recognition of the disease, a detailed family history and a thorough evaluation of signs and symptoms are the cornerstones for appropriate management. Because of the different systems affected and diversity in the clinical picture, once diagnosis is established, a multidisciplinary approach team of various specialists is required for a successful treatment.
In general, OKCs are more common in the adult life, the peak incidence being the third decade of life [10]. Observation showed that OKCs were often the first sign of GGS in 78% of the cases [11]. OKCs are among the most consistent and common features of GGSS. They are found in 65 to 100% of affected individuals. Clinically, the lesions are characterized by aggressive growth and a tendency to recur after surgical treatment [12]. They are diagnosed with dental panoramic radiography. Keratocysts may show a uni - or multilocular pattern and the cystic spaces may have a smooth or scalloped border [13].
Although benign, the recurrence rate after excision of OKC is high, ranging from 12% to 62.5% and multiple recurrences do occur. Recurrence rates of 82% and 61% for OKC and solitary odontogenic keratocysts, respectively, has also been reported. Due to the recurrence of odontogenic keratocysts, jaw deformities may result from multiple surgeries. An annual dental panoramic radiograph is usually suggested between the ages of 8 and 40 years to aid in monitoring the recurrence or development of new OKC. A recurring cyst can be a new cyst that originates from epithelial residue or a microcyst left behind in the overlying mucosa. It is believed that the aggressive behavior and high rate of recurrence of OKC are due to a higher rate of proliferation of the epithelial lining [14].
Removal of cystic lesions, similar to the one seen in our case, weakens the remaining bony integrity and places it at risk of pathologic fracture. This can be managed with intermaxillary fixation or placement of reconstruction plate.

Conclusion

Early diagnosis of GGS play an important role as it may leads to malignancy and can therefore be treated appropriately Health specialists like pediatricians, dentists, maxillofacial surgeons, dermatologists, etc., must have good knowledge of the features of GGS so that the patient can be treated early and have planned follow up sessions.
It is also utterly important that patients with multiple skin lesions be evaluated regularly by a dermatologist.
Dermatoscopy is an important preventive measure.

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Conflict of interests

The authors declare that there are no competing interests.

Reference

[1]. Olivero Y, Otero-Colón J, Rahman S, Grodman B, Vas V. Understanding Nevoid Basal Cell Carcinoma Syndrome (Gorlin Syndrome): A Case Report. Cureus. 2023;15(3).
[2]. Jarisch. Zur lehre von den hautgeschwülsten. Archiv für Dermatologie und Syphilis.

1894;28(1):163-222.
[3]. White JC. Multiple benign cystic epitheliomas. J Cutan Genitourin Dis. 1894;12(4):477-84.
[4]. Gorlin RJ, Goltz RW. Multiple nevoid basal-cell epithelioma, jaw cysts and bifid rib: a syndrome. New England Journal of Medicine. 1960;262(18):908-12.
[5]. Marinho SA, da Silva HPV. Basal cell nevoid carcinoma syndrome: A review. Seven Editora. 2023.
[6]. Bree AF, Shah MR, Group BC. Consensus statement from the first international colloquium on basal cell nevus syndrome (BCNS). American journal of medical genetics Part A. 2011;155(9):2091-7.
[7]. Kimonis VE, Goldstein AM, Pastakia B, Yang ML, Kase R, DiGiovanna JJ, Bale AE, Bale SJ. Clinical manifestations in 105 persons with nevoid basal cell carcinoma syndrome. American journal of medical genetics. 1997;69(3):299-308.
[8]. Evans D, Sims D, Donnai D. Family implications of neonatal Gorlin's syndrome. Archives of disease in childhood. 1991;66(10 Spec No):1162-3.
[9]. Ramaglia L, Morgese F, Pighetti M, Saviano R. Odontogenic keratocyst and uterus bicornis in nevoid basal cell carcinoma syndrome: case report and literature review. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2006;102(2):217-9.
[10]. Myoung H, Hong SP, Hong SD, Lee JI, Lim CY, Choung PH, Lee JH, Choi JY, Seo BM, Kim MJ. Odontogenic keratocyst: review of 256 cases for recurrence and clinicopathologic parameters. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2001;91(3):328-33.
[11]. Lo Muzio L, Nocini PF, Savoia A, Consolo U, Procaccini M, Zelante L, Pannone G, Bucci P, Dolci M, Bambini F, Solda P, Favia G. Nevoid basal cell carcinoma syndrome. Clinical findings in 37 Italian affected individuals. Clinical genetics. 1999;55(1):34-40.
[12]. Sun L-S, Li X-F, Li T-J. PTCH1 and SMO gene alterations in keratocystic odontogenic tumors. Journal of dental research. 2008;87(6):575-9.
[13]. Lo Muzio L. Nevoid basal cell carcinoma syndrome (Gorlin syndrome). Orphanet journal of rare diseases. 2008;3:1-16.
[14]. Ramesh M, Krishnan R, Chalakkal P, Paul G. Gorlin-Goltz Syndrome: Case report and literature review. Journal of oral and maxillofacial pathology : JOMFP. 2015;19(2):267.