A Case Report of Gorlin-Goltz Syndrome

Saw Yu Hlaing*, Tun Ngwe*, Win Naing*

*Department of Oral and Maxillofacial Surgery, University of Dental Medicine (Yangon)

Abstract

Gorlin Goltz syndrome (GGS) is a rare autosomal dominant inherited conditions. It involves many organs, but principally affects the skin, endocrine and nervous systems. It consists of the classic triad of basal cell carcinoma, multiple jaw cysts and skeletal deformities along with other defects. This case report is an unusual case of 18 years old female patient who reported with the complained of swelling and pain at posterior region of right side of mandible. Radiographic examination revealed multiple cystic lesions in both upper and lower jaws which were found to be Odontogenic keratocyst, presence of bifid rib, and multiple nevi. The clinicopathological diagnosis was made as Gorlin Goltz syndrome since the present case exhibited 3 major criteria.

Introduction

Gorlin–Goltz syndrome is also known as nevoid basal cell carcinoma syndrome (NBCCS). It is uncommon, autosomal dominant inherited disorder. It’s prevalence is varying from 1:57,000 to 1:256,000 people. Males and females are equally affected.

Gorlin–Goltz syndrome is caused by mutations in genes encoding key proteins, especially PTCH1, encoding in the hedgehog signaling pathway, controlling growth and development of normal tissue. GGS is characterized by basal cell carcinomas along with multiple odontogenic keratocysts and congenital skeletal anomalies.

Case Report

A 21 years old female patient was admitted with the chief complaint of swelling at the lower right posterior region of oral cavity to the Department of Oral and Maxillofacial Surgery. She noticed the slight swelling at lower right posterior region for about 4 months. Swelling was gradually enlarged and she suffered from pain. After 2 months, another swelling was appeared at the upper right posterior region. Pain with pus discharge was presented.

Family History

Her sister took the treatment of multiple cysts removal in both jaws at the Department of Oral and Maxillofacial Surgery for last 5 years ago.

General Examination

Extraorally, there were Facial asymmetry and swelling with diffuse margin was present at the
right side of the face. But there were no signs of inflammation. Flat nasal bridge, increased intercanthal distance and multiple skin nevus were seen.

Intraorally, swelling was present at the lower posterior region of the right side with buccal swelling only. Fluctuation and slight mobility of teeth were found. There were no pain and tenderness, no lip numbness. Missing second premolar was also noticed. Another swelling was also found at the upper right premolar region with buccal swelling only, fluctuation present, no mobility of teeth, pain and tenderness.

Investigations
Haematologic investigations were within normal limits. So, enucleation of all cystic lesions was performed under general anesthesia and tissue samples were sent for histopathologic examination.
Based on the clinical, radiographic, and histologic findings, and referring to the diagnosis criteria for NBCCS established by Evans et al and modified by Kimons et al, the patient was diagnosed as having Gorlin-Goltz syndrome.

**Discussion**

Gorlin-Goltz syndrome also known as Nevoid Basal Cell Carcinoma syndrome was first recognized in 1894 by Jarish and White as essential phenotypic features of NBCCS. In 1960, Robert James Gorlin and William Goltz gave a complete description of the syndrome. Multiple OKCs, nevoid basal cell carcinomas of the skin, and skeletal anomalies are the principal clinical features of GGS. The diagnostic criteria of NBCCS requires the presence of two major, or one major and two minor criteria. Diagnostic criteria were originally defined by Evans et al in 1993, later modified by Kimons et al in 1997.

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<th>Table 1: Diagnosis criteria for NBCCS according to Evans et al (2 majors or 1 major and 2 minor criteria should be satisfied for positive diagnosis)</th>
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<td><strong>Major Criteria</strong></td>
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<td>- more than 2 BCC, 1 BCC before 30 years of age; or more than 10 basal cell nevi</td>
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<tr>
<td>- any odontogenic keratocyst (proven on histology) or polyostotic bone cyst</td>
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<tr>
<td>- 3 or more palmar or plantar pits</td>
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<tr>
<td>- Ectopic calcification; lamellar or early (&lt;20 years of age) false calcification</td>
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<td>- Family history of NBCCS</td>
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<th>Table 2: Diagnosis criteria for NBCCS according to Kimons et al</th>
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<td><strong>Major Criteria</strong></td>
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<tr>
<td>- More than 2 BCC at or before 20 years of age</td>
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<tr>
<td>- Odontogenic keratocysts of the jaws (proven by histopathologic analysis)</td>
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<td>- 3 or more palmar or plantar pits</td>
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<td>- Bilateral calcification of the falx cerebri</td>
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<td>- Bifid, fused or markedly spayed ribs</td>
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<td>- A first degree relative with NBCCS</td>
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The present case report showed a female patient presenting some of features such as:
- multiple OKCs in maxilla and mandible
- multiple skin nevus
- bifid ribs
- ocular hypertelorism
- family history

The above features confirmed the diagnosis of GGS or NBCCS. GGS is caused by mutations in a tumor suppressor gene PTCH located in chromosome 9q22.3. This protein can be found in the Hedgehog signaling pathway. PTCH in the absence of its ligand. It acts as a cell-cycle regulator, normally inhibiting expression of downstream genes that control cell fate, patterning and growth. One of the features found in this syndrome and emphatically mentioned in literature is the development of multiple basal cell carcinomas, especially in the head and neck region. In this case it has not been to identify the presence of basal cell carcinoma. They can vary from flesh colored to ulcerating plaques and may be mistaken for nevi, skin tags or
haemangioma. Some of the most common clinical findings of the syndrome are discovered through radiography;
1. Panoramic radiograph to detect the multiple jaw cysts,
2. Skull radiograph for the evaluation of falx cerebri calcification,
3. Chest radiograph to detect the bifid, fused or splayed ribs,
4. CT as well as MRI to find further abnormalities.
In the presented case, the X ray findings were;
1. In Panoramic view, multiple cystic lesions in both jaws were found,
2. In CXR, bifid ribs were found in 5th rib,
3. In Skull X ray, there was no calcification.
90% of GGS is associated with multiple keratocysts in patients at the second decade of their life.
In the presented case, one of the first signs were multiple cystic lesions involving the maxilla and mandible, which have been histopathologically diagnosed as odontogenic keratocysts. Multiple OKCs alone may be the confirmatory of the syndrome. Syndrome keratocysts were found to have a markedly increased number of satellite cysts, solid islands of epithelial proliferation, odontogenic rests within the capsule, and mitotic figures in the epithelial lining of the main cavity. Clinically, the lesions are characterized by aggressive growth and a tendency to recur after surgical treatment. So, Long follow-up periods are suggested for this kind of tumor.
High recurrence has led to the evolution of various treatment modalities over a period of time as; conservative (enucleation, enucleation and curettage, enucleation and peripheral ostectomy, enucleation and chemical cautetization with Carnoy’s solution ) and an aggressive ( marginal resection, segmental resection ).
In this case, enucleation and curettage of all cystic lesion was performed under general anaesthesia and informed to patient about the significance of OKC and likelihood of the development of further cysts because of the young aged female patient with multiple cystic lesions, maxillofacial morphological defect and irritation to vital structures.
In order to minimize the secondary morbidities after the treatment, patients with OKC should be observed carefully by radiographic imaging particularly during the first year.

Conclusion
In any patient with multiple OKCs, the possibility of GGS must be considered. Complete clinical examination and histopathological analysis must be performed to detect any features associated with this syndrome. It is great importance to make an early diagnosis since the severity of complications, such as malignant skin and brain tumors can be reduced, and maxillofacial deformities related to the jaw cysts can be avoided. Regular follow-up should be offered.

Figure 10: Follow up X ray (Post op 2nd month)

References
Keceli O, et al. an common disorder with multiple skeletal anomalies: Gorlin-Goltz Syndrome.