# Think of a Gorlin-Goltz syndrome in front of these signs: Report of a case

Original Article

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## ABSTRACT

**Introduction:** Gorlin and Goltz syndrome, also known as nevoid basal cell carcinoma syndrome, is a rare hereditary affection, with autosomal dominant inheritance. Linked to a mutation in the tumor suppressor gene PTCH. It is characterized by a spectrum of developmental abnormalities and a predisposition to various cancers. Our role is essential in the diagnosis of this syndrome through the maxillofacial signs specific to its expression.

**Observation:** We report the case of a 14-year-old patient, in whom all the clinical and radiological signs noted during her hospitalization in our maxillofacial surgery department at the Moulay Ismail military hospital in Meknes, supported the diagnosis of Gorlin-Goltz syndrome. The presumptive diagnosis of the maxillary swellings presented by the patient indicated keratocysts. Our patient underwent curettage and enucleation of the maxillary and mandibular cysts, and the diagnosis of keratocysts was confirmed histologically.

**Discussion:** Gorlin and Goltz syndrome is an autosomal dominant genetic disorder. Inheritance is autosomal dominant. The Patched gene (PTCH) located on chromosome 9 at 9q22.3-q31, is the gene responsible for this syndrome. Clinically, this condition is characterized by a spectrum of developmental abnormalities and a predisposition to different cancers. These clinical manifestations are age-dependent. In order to facilitate the diagnosis given the complexity of the clinical signs found in this syndrome, specific criteria have been established. The diagnosis of nevoid basal cell carcinoma syndrome requires the presence of 2 major criteria or one major and 2 minor criteria.

**Conclusion:** Gorlin and Goltz syndrome is a rare condition, multisystemic. It is classically defined by the triad composed of basal cell nevi, maxillary keratocysts and skeletal malformations. Therapeutic management remains simply symptomatic. The oncological potential of this syndrome makes it serious, requiring early detection and regular and prolonged monitoring of patients and their descendants.

**Key Words:** Nevoid basal cell carcinoma syndrome, Odontogenic keratocyst, The PTCH gene.

**Received:** 13 November 2022, **Accepted:** 22 November 2022.

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**ISSN:** 2090-097X, July 2022, Vol. 13, No. 3

## INTRODUCTION

Gorlin and Goltz syndrome, also called nevoid basal cell carcinoma syndrome, is a rare hereditary affection, with autosomal dominant inheritance, complete penetrance and variable expressivity.

Linked to a mutation in the tumor suppressor gene PTCH with chromosomal location 9q22.3-q31. It is characterized by a spectrum of developmental abnormalities and a predisposition to various cancers. Our role is essential in the diagnosis of this syndrome through the maxillofacial signs specific to its expression, in particular: odontogenic keratocysts, dental inclusions and ectopias which can be inaugural. We report the case of a patient aged 14 years old, diagnosed with Gorlin's syndrome during her hospitalization in our maxillofacial surgery department at the Moulay Ismail military hospital in Meknes, initially referred by her general practitioner following chronic cheek swelling.

## OBSERVATION

The medical investigation revealed no family history. The general examination reveals learning difficulties and vertebral kyphoscoliosis.

On maxillofacial examination, a longilinear facies with macrocephaly, protruding frontal bumps, hypertelorism, widened base of the nose, prominent brow ridges are discovered (Figure 1) and several small nevi disseminated on the face (Figure 2), also present on the rest of the body.

The endooral examination reveals a voluminous left maxillary cyst, bulging in the vestibule, responsible for dental malpositions affecting the teeth from the 21$^{st}$ to the 24$^{th}$ with an anterior infraclusion (Figure 3) and an ogival palatal vault. The oral mucosa is normal.

 *DOI: 10.21608/OMX.2022.174538.1174*

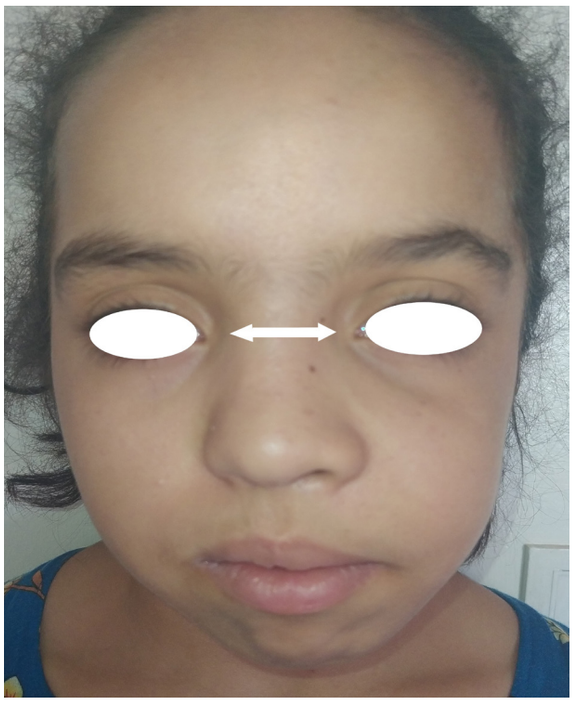

**Figure 1:** Frontal photo objectifying the protrusion of the frontal bumps, the prominent eyebrow arches, the enlarged base of the nose and the hypertelorism.

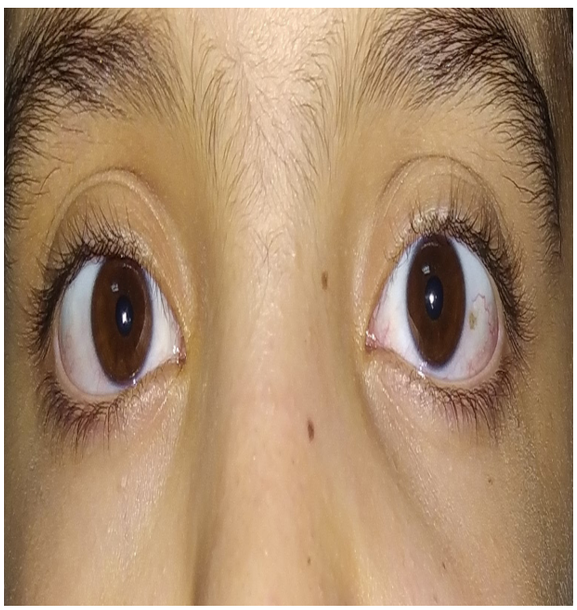

**Figure 2:** Multiple basal cell nevi.

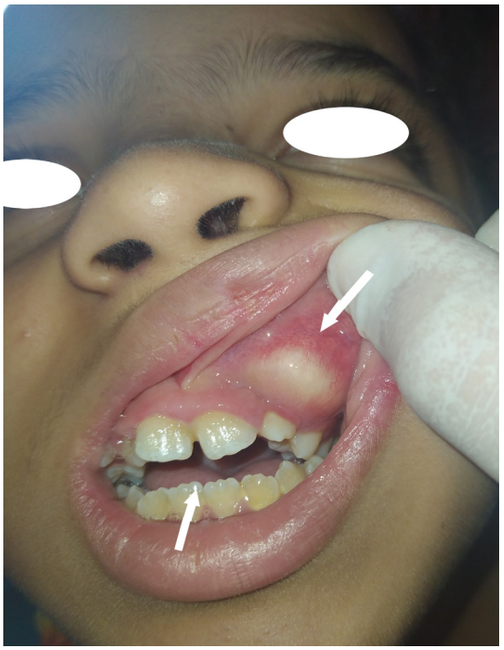

**Figure 3:** Photo objectifying a voluminous left maxillary cyst, bulging in the vestibule and an anterior infraclusion.

The panoramic X-ray showed the presence at the mandibular level of two radiolucent images surrounding the crown of the impacted wisdom teeth, with at the left maxillary level the presence of a voluminous radiolucent image repressing the adjacent teeth with unilocular cystic appearances with clear limits (Figure 4).

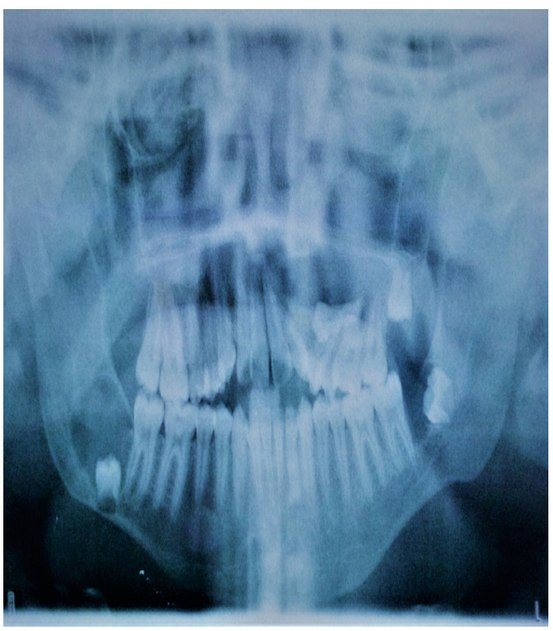

**Figure 4:** Panoramic radiography showing the radiolucent areas.

The presence of upper maxillary lesion related to the sinus with the appearance of an impacted tooth intracystically and the presence of mandibular lesions related to the inferior alveolar nerve prompted us to prescribe a maxillofacial CT scan (Figures 5, 6).

All the clinical and radiological signs noted supported the diagnosis of Gorlin-Goltz syndrome. The presumptive diagnosis of the swellings present indicated odontogenic keratocysts. Our patient underwent curettage-enucleation of the maxillary and mandibular cysts with extraction of impacted teeth (Figures 7, 8).

The histological study confirmed the diagnosis of keratocysts.

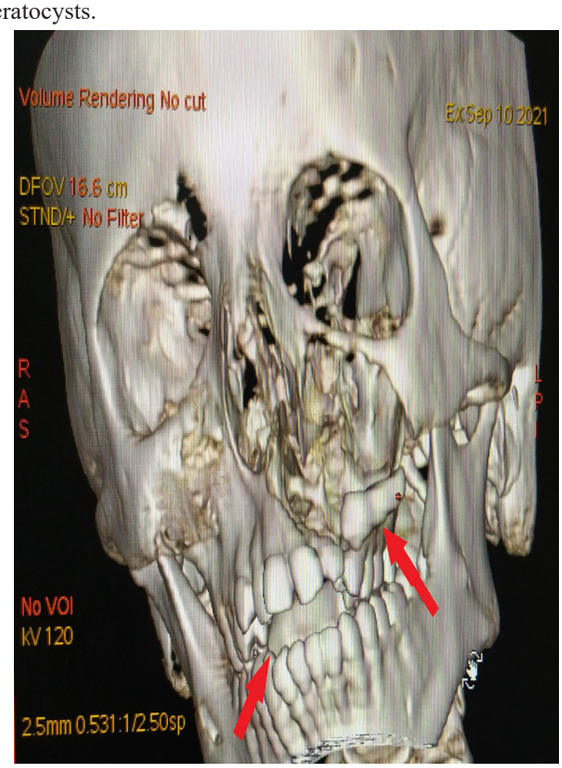


**Figure 5:** 3D reconstruction showing a voluminous cystic lesion of the left maxilla blowing the external cortex with a tooth impacted intracystically with occlusal disorder such as anterior open bite.

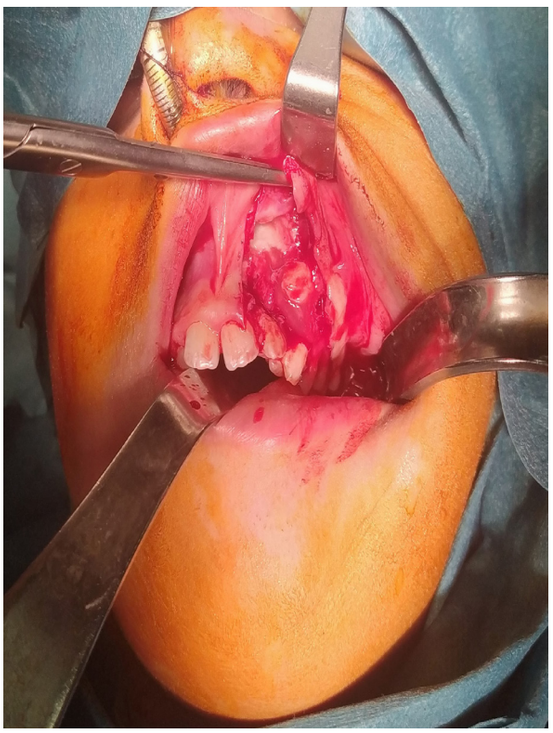

**Figure 7:** Enucleation of anterior maxillary cystic lesion left.

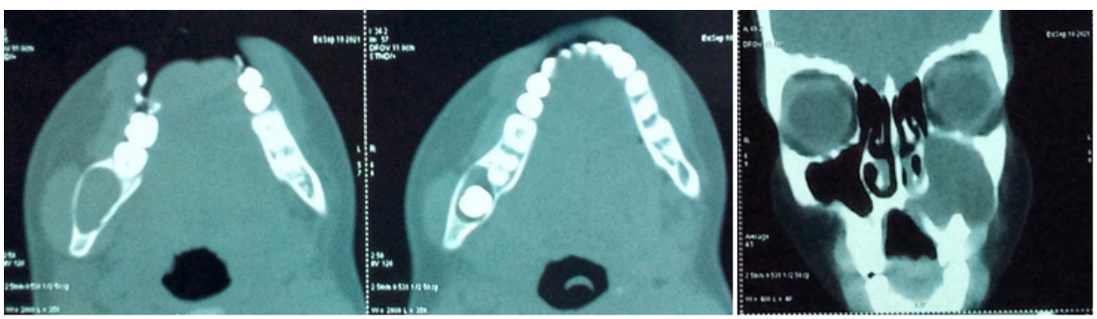

**Figure 6:** Axial and coronal slices showing the presence at the mandibular level of a radiolucent image surrounding the crown of the impacted wisdom tooth, with the presence of a voluminous radiolucent image at the left maxillary level.

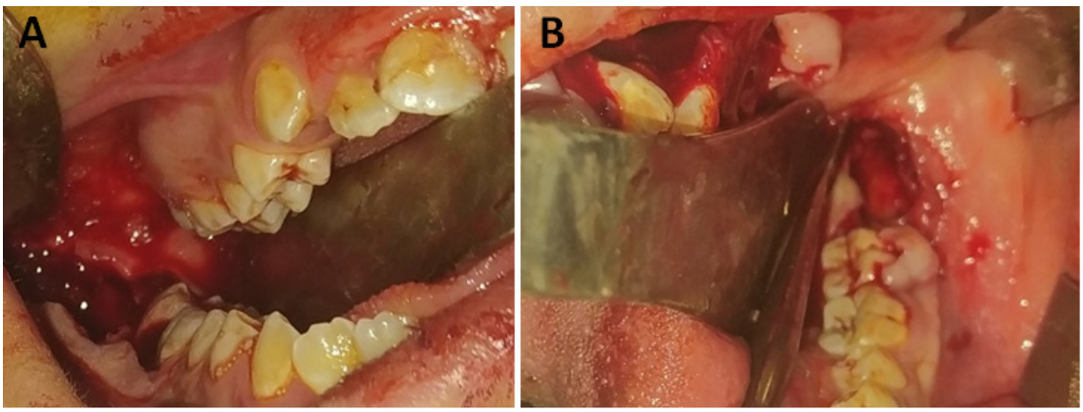


**Figure 8:** Bilateral enucleation of posterior mandibular cystic lesions.

## DISCUSSION

Gorlin and Goltz syndrome is an autosomal dominant genetic disorder[1, 2]. First defined by Gorlin and Goltz in 1960. Inheritance is autosomal dominant, with 97 % penetrance and variable expressiveness[1, 2, 4]. Between 5 and 50 % of patients have neomutations and in more than 60 % of cases, the medical investigation does not reveal a family history[4, 5, 8]. The Patched gene (PTCH) located on chromosome 9 at 9q22.3-q31, supposed to have an anti-oncogenic role, is the gene responsible for this syndrome. According to Knudson, there is a loss of the two alleles of this gene with a first germline mutation, responsible for the malformative syndrome, which predisposes to the occurrence of tumours, and the second somatic mutation which leads to the development of the tumour. The majority of mutations identified in the PTCH gene in patients are nonsense mutations that result in the synthesis of a truncated defective protein. Clinically, this condition is characterized by a spectrum of developmental abnormalities and a predisposition to different cancers[1, 2, 4]. These clinical manifestations are age-dependent[2, 3, 4]. It results in numerous basal cell nevi, odontogenic keratocysts of the jaws, palmoplantar hyperkeratosis, skeletal anomalies, ectopic intracranial calcifications and evocative facial dysmorphism; mental retardation is observed in 5 % of patients[2, 3, 7]. Some signs are present from birth, others appear gradually during the second decade. Basal cell nevi are found all over the body. These are papules, the same color as brown or pale skin, 1 to 10 mm in diameter. Usually between the age of puberty and 35 years, they transform into basal cell carcinomas[4, 9]. Odontogenic keratocysts are present in 75 % of patients, sometimes as the only manifestation during the first decade. They are often bilateral or multiple, large and recurrent[4, 9, 10]. In order to facilitate the diagnosis given the complexity of the clinical signs found in this syndrome, specific criteria have been established. The diagnosis of nevoid basal cell carcinoma syndrome requires the presence of 2 major criteria or one major and 2 minor criteria[2, 4, 8] (Figure 9).

Therapeutically, the treatment is symptomatic with special carcinological monitoring, involving the intervention of different disciplines. Sun protection is imperative and patients should be checked regularly, in particular a dermatological examination should be carried out every two to three months. The treatment of odontogenic keratocysts is surgical aimed at eradicating the entire lesion and reducing the potential for recurrence. Various surgical techniques have been proposed to treat keratocysts. From more conservative procedures (enucleation, marsupialization), to more aggressive approaches (eg en bloc resection)[11]. The surgical treatment of the keratocysts in our clinical case consisted of simple enucleation followed by meticulous curettage. Genetic investigation is essential for the detection of new cases in the family. A neurological examination is required annually in children up to the age of seven in order to detect a medulloblastoma.

**Table 1:** Diagnostic criteria for basal cell nevomatosis:

| Major criteria | Minor criteria |
|---|---|
| Multiple basal cell carcinomas (> 2), or basal cell carcinoma before age 20 | Macrocephaly |
| Histologically proven odontogenic cysts of the maxilla | Orofacial congenital malformations (one or more): cleft lip or palate, frontal hump, coarse face, moderate or severe hypertelorism |
| Palmoplantar pits ≥ 3 | Other skeletal abnormalities: Sprengel malformation, pectus, syndactyly |
| Ribs bifid, fused or particularly flared | Radiological abnormalities: closed sella, vertebral abnormalities: hemi-vertebrae, fusion or elongation of the vertebral bodies, bone defects in the hands or feet, small bony flame-shaped gaps in the hands and feet |
| First-degree relative affected | Ovarian fibroma |
| | Medulloblastoma |

## CONCLUSION

Gorlin and Goltz syndrome is a rare condition, multisystemic. It is classically defined by the triad composed of basal cell nevi, maxillary keratocysts and skeletal malformations. Therapeutic management remains simply symptomatic. The oncological potential of this syndrome makes it serious, requiring early detection and regular and prolonged monitoring of patients and their descendants.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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