

Gorlin-Goltz syndrome: From Diagnosis to Treatment: A Case Report and Literature Review

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Abstract

Gorlin syndrome, also known as nevoid basal cell carcinoma syndrome (NBCCS), is a hereditary condition transmitted as an autosomal dominant trait, due to a mutation in the tumor suppressor gene PTCH mapped to chromosome 9q 22.3-q31. It is a rare syndrome characterized by a series of developmental abnormalities and predisposition to various cancers. The Gorlin syndrome-Goltz combines several general clinical manifestations including many basal cell carcinomas and nevi, palmar-plantar hyperkeratosis, skeletal abnormalities, intracranial ectopic calcifications, facial dysmorphism with macrocephaly.

The dentist have an important role in the diagnosis of this syndrome through maxillofacial signs specific to its expression including: keratocysts odontogenic, inclusions and dental ectopias that can be inaugural.

Keywords: Gorlin-Goltz Syndrome; Odontogenic Keratocyst; Nevoid Basal Cell Carcinoma

Introduction

We report the case of a female patient, 22years old, who has been suffering from this syndrome for 10 years, followed up in the department of maxillofacial surgery, after being referred to the dental hospital center Ibn Rochd in Casablanca for surgical excision of the mandibular cystic lesions.

Observation

A review of the patient's family history revealed nothing significant. The general medical examination revealed that the patient is having intellectual disability and showed a vertebral kyphoscoliosis (Figure 1).

The maxillofacial examination highlighted different clinical signs, including:

- Macrocephaly and long face
- Evidence of frontal bossing, strabismus, bilateral ptosis, wide alar base and hypertelorism (Figure 2)
- Small nevi occurring on the face (Figure 3)
- Important superciliary arch.

The endobuccal examination revealed:

- Gingivitis and calculus bridge;
- Important swelling on the gingivo-buccal vestibule from the anterior to the posterior region, complicated by a fistula (Figure 4);
- Ectopic and heterotopic teeth;
- High arched palate (Figure 5).



Figure 1: A photo of the profile showing the vertebral kyphoscoliosis.

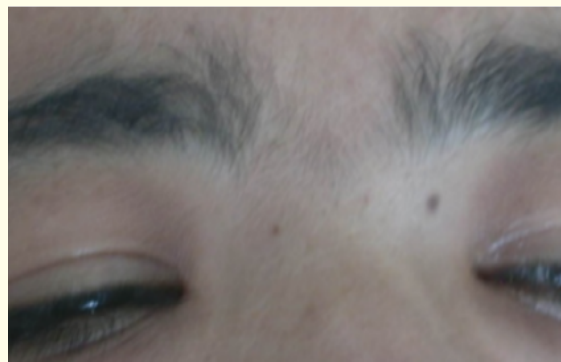


Figure 3: A multiple small nevi occurring on the face.



Figure 2: A photo of the face showing the frontal bossing, strabismus, bilateral ptosis, wide alar base and hypertelorism.



Figure 4: Swelling on the external table of the mandibula from the anterior to the posterior region, complicated by a fistula.



Figure 5: High arched palate.

The panoramic X-ray revealed mandibular and maxillary radiolucent well defined cystic lesions involving teeth (Figure 6).



Figure 6: The panoramic X-ray revealed mandibular and maxillary radiolucent well defined cystic lesions.

The maxillary lesions with sinus involvement, and mandibular ones associated with the inferior alveolar nerve, made us request a Dentascan (Figure 7 and 8).



Figure 7: High axial section of the Dentascan showing the inclusion of the 28 associated to a cystic lesion.



Figure 8: Axial section showing mandibular cystic lesions.

Diagnosis

The association of clinical and radiographic signs supported the diagnosis of Gorlin-Goltz syndrome.

About the gingivo-buccal swelling, the presumptive diagnosis of odontogenic keratocyst is made.

Treatment plan:

The patient's treatment plan was as follows:

- Motivation and oral hygiene instructions.
- Scaling and root planning.
- Surgical treatment of cystic lesions.
- Orthodontic care.

Medical treatment/The management of the patient

The lesion in left posterior mandible was operated first, followed by surgical excision of the anterior cyst, under locoregional anesthesia (Figure 9-11).

The anatomopathologic examination retained the diagnosis of keratocysts (Figure 12).

Maxillary cysts were operated in maxillofacial surgery department.

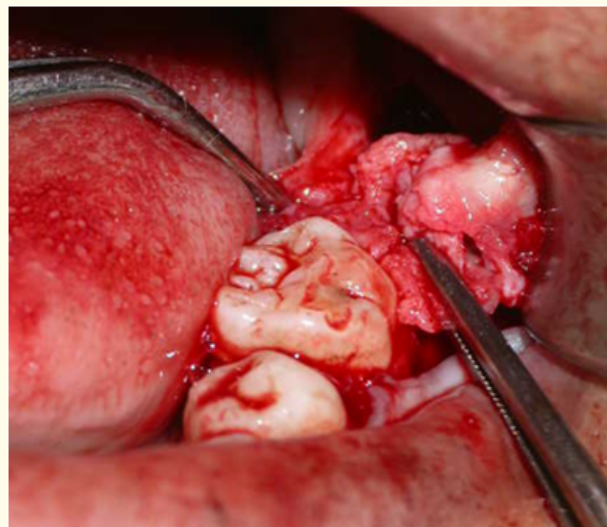


Figure 9: Surgical excision of the posterior mandibular cystic lesion.

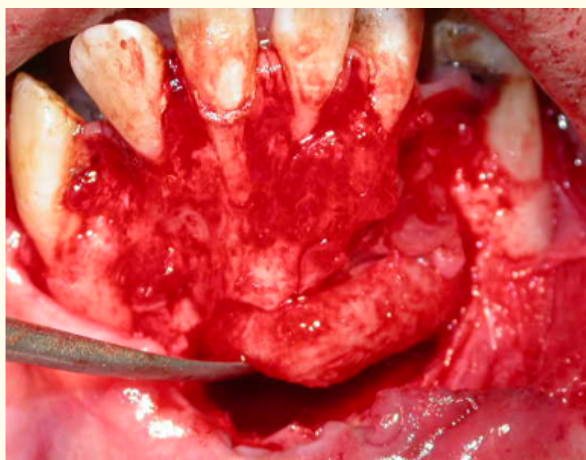


Figure 10: Surgical excision of the anterior mandibular cystic lesion.

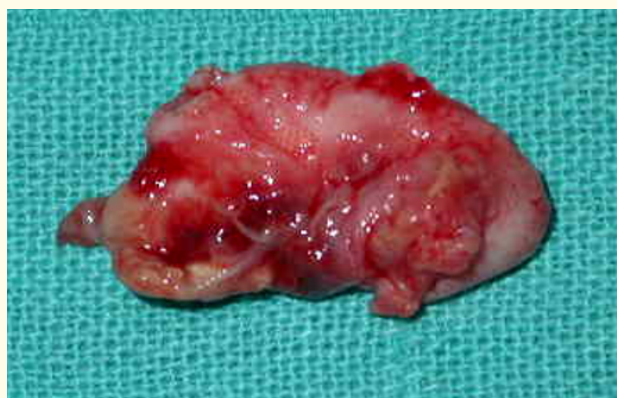
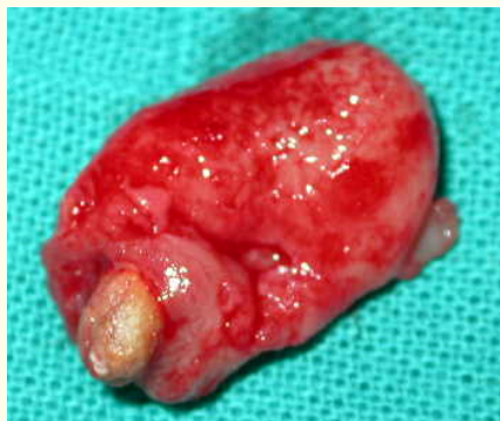


Figure 11: The excised tissues.

Discussion

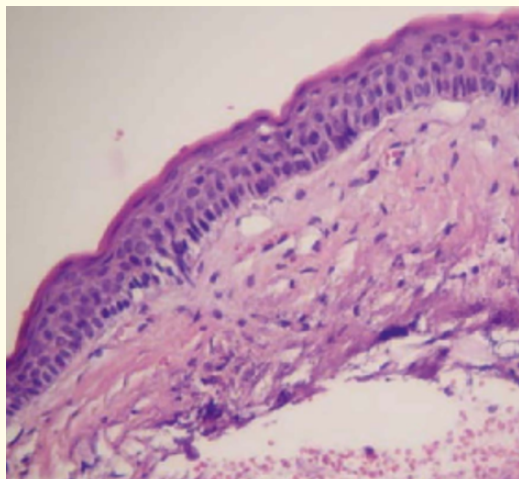


Figure 12: Microscopic appearance of the cystic wall: Parakeratosis cells on the surface, palissadic and cylindrical basal lamina.

Gorlin-Goltz syndrome (GGS) occurs with equal frequency in both sexes. Most reported cases have been in white race [1].

In the first decade, the early clinical signs are maxillary cysts. In one third of the cases, the cutaneous manifestations begin at puberty. The diagnosis criteria for Gorlin-Goltz can be presented as follows:

- Maxillo dental signs
- Odontogenic keratocysts.

Approximately 5% of Odontogenic keratocysts are associated with this syndrome. They are found in 80% of the affected individuals while they are present in only 5 to 7% of the general population [2,4-7].

Dental anomalies

The other abnormalities of the stomatological system include malocclusions, impacted teeth, ectopic and heterotopic teeth and dental agenesis. In addition to deformed teeth and missing teeth (30% of cases), the susceptibility to cavities is more common in individuals with Gorlin Goltz syndrome than among their unaffected family members [8].

Cutaneous and mucosal signs

Naevi and basal cell carcinomas

Clinically, naevi often develops first and behave differently than basal cell carcinoma, that can appear and grow from the naevi.

The development of basal cell carcinoma is one of the most problematic features of the Gorlin syndrome, their number varies from a few to several hundred, and they have a broad spectrum of clinical presentations that can go from a clear to dark papule with a hard consistency and a flat surface, to ulcerated and pigmented plaques of different sizes [2,3,9].

Palmar and plantar pits

The pits found on the skin of palms and soles of feet seem to be pathognomonic and constitute one of the disease's major criteria [8,10,11].

Epidermoid cysts

Large, and often multiple, epidermoid cysts (1 - 2 cm), resembling odontogenic keratocysts, occur on limbs and trunk in about 50% of Caucasians with the syndrome, among African-Americans about 35% present these cysts, but further studies are needed to evaluate racial difference [2].

Bone signs

Calcified falx cerebri

Calcification of the cerebral falx is a very useful sign for diagnosis and must strongly suggest that a child is affected by Gorlin's syndrome. This can appear very early in life, but it is often more obvious at the end of childhood, and its grading progresses with age [2,8].

Skeletal anomalies

Abnormalities of skeletal development are present at birth and 70% of patients with this syndrome have at least one congenital skeletal abnormality. The presence of bifid ribs is the most characteristic musculoskeletal manifestation of the disease [12,13].

These malformations can give an unusual shape to the thorax, including inclination characteristic down shoulders. The bifid ribs are noted in about 6% of the general population. The skeletal anomalies, with the kyphoscoliosis, cause the pectus excavatum

(or funnel chest or caved-in deformity of the thoracic wall) [3,8].

Vertebral anomalies

Abnormalities of cervical or thoracic vertebrae are useful diagnostic signs, being found in about 60% of the people affected. The vertebrae C6, C7, T1 and T2 are the most frequently involved [12,14].

Gynecological signs

Fibroids and ovarian fibrosarcomas

Initially, it was difficult to know the absolute frequency of ovarian fibroids associated with the GGS because they only appear when they increase in size and become calcified and twisted on their pedicles.

The fibroids associated with the syndrome are most often bilateral (75%), multi-nodular, calcified and the ovaries are often overlapped medially [2,11,15,16].

Hypogonadism in humans

5 to 10% of men may show signs of hypogonadotropic hypogonadism such as anosmia, cryptorchidism, female pubic hair, gynecomastia, and/or scanty hair on the face or the body. Gorlin has cited many examples. Shanley and al, in their investigation, noted that 10% of cases had anosmia [11].

Neurological and psychiatric signs:

- Intellectual disability
- Agenesis of the corpus callosum
- Medulloblastoma
- Meningioma

Diagnosis

Because of the complexity of the GGS clinical signs, some specific criteria are needed for the diagnosis. The diagnosis of the nevoid basal cell carcinoma syndrome can be established in the presence of two major or one major and two minor criteria that are represented in the following table 1 [10].

Regarding the lesions reported in the literature, our patient presents a major and two minor criteria, which allows us to confirm the diagnosis of Gorlin-Goltz syndrome.

<p>Major criteria:</p> <ul style="list-style-type: none"> • Multiple basal cell carcinomas <i>or single</i>, which occur in patients under 20 years of age. • odontogenic cysts of the maxillary histologically proven • Plantar or palmar pits (\geq three). • Bifid, fused or markedly splayed ribs. • First-degree relative with Gorlin-Goltz syndrome.
<p>Minor criteria:</p> <ul style="list-style-type: none"> • Macrocephaly • Orofacial congenital malformations (one or more): cleft lip or palate, frontal hump, coarse face, moderate or severe hypertelorism • Other skeletal abnormalities: Sprengel malformation, pectus, syndactyly • Radiological abnormalities: closed turcic stool, vertebral anomalies: hemi vertebrae, fusion or lengthening of the vertebral bodies, bone defects of the hands or feet, small gaps Bone-shaped flame of hands and feet • Ovarian fibromoma • Medulloblastoma

Table 1

Treatment of patients affected by nevoid basal cell carcinoma syndrome (NBCCS)

Patient education

Affected patients need information about the syndrome. The results of several studies epidemiological studies have shown that the risks of NBCCS have a strong correlation with exposure to UV radiation. So, these patients are recommended to avoid excessive exposure to the sun. They have to wear 100% UV blocking sun-glasses since the skin around the eyes (as well as nose/ears skin) is vulnerable to the NBCCS.

Sunscreens with a high degree of protection (SPF 30 +) must be applied before going out and reapplied every 2 to 3 hours, and more frequently when swimming or sweating [3].

Odontological support

The role of the dentist first starts with the diagnosis of nevoid basal cell carcinoma syndrome.

The table 2 of VIGUIER highlights the age of appearance of the 3 main symptoms of the NBCCS and shows the essential role of the dentist in screening for this syndrome [17].

Evolution of the syndrome and screening steps		
	5 ans	15 ans
Medulloblastoma	Epidermoid cysts	Basel Cell Carcinoma
Pediatrician	Dentist	Dermatologist
No sign	Screening	Diagnosis

Table 2

Treatment of keratocysts

The treatment of odontogenic keratocysts is surgical. The objectives of the surgical treatment of Keratocysts is the eradication of the entire lesion as well as reducing the potential of recurrence. Various surgical techniques have been proposed to treat keratocysts. These range from more conservative (e.g. enucleation, marsupialization), to more aggressive approaches (e.g. block resection) [18]. The therapeutic choice is made according to the topography of the keratocysts, their extension, and their evolutionary aspect, primitive or recidivant [19-23]. Surgical treatment of keratocysts in this case consisted of a simple enucleation followed with a careful curettage.

Prognosis

The odontogenic keratocysts holds a special place in the odontogenic cysts. We consider them currently as benign tumors because of their high mitotic activity and important bone lysis generated. They present an increased risk of malignant transformation into squamous cell carcinoma.

As these lesions have a significant recurrence potential even after a long period from the primary treatment (up to 10 years later), it is recommended to carry out annual examination. The lowest recidivism rates are observed after the radical interventions, the highest ones are recorded after simple enucleations [1].

Conclusion

Gorlin Goltz syndrome is a rare but not an exceptional disease that must be known by the dentist. It is classically defined by the triad composed of basal cell nevus, maxillary keratocysts and skeletal malformations. Therapeutic management remains simply symptomatic. The oncological risk of this syndrome makes its severity, requiring early diagnosis and regular and prolonged monitoring of patients and their progenies.

Conflict of Interest

The authors declare that they have no conflict of interest.

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