Case Report

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Gorlin-Goltz Syndrome: A Case Report with Review on Diagnostic Criteria

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ABSTRACT

Background: The Gorlin–Goltz syndrome, also known as Nevoid Basal Cell Carcinoma syndrome(NBCCS) is an infrequent multisystemic disease that is inherited as an autosomal dominant condition shows a high level of penetrance & variable expressivisity. It is characterized by the presence of multiple Keratocystic odontogenic tumor (KCOT) in the jaws, multiple basal cell nevi or carcinomas and skeletal abnormalities. As most of the clinical manifestations of this syndrome are pertained to head and neck region, this syndrome is commonly encountered maxillofacial surgeon. Having sound knowledge about diagnostic criteria and genetic biology of this syndrome improves the treatment outcome and avoid associated complications. This case report along with review, highlights possible percentage of commonly appearing clinical manifestations of syndrome and importance of awareness among physicians or surgeons who encounter this condition so as to improve prognosis and prevent further risks.

Keywords: Gorlin - Goltz Syndrome, Nevoid basal cell carcinoma syndrome, Multiple odontogenic keratocyst, Falx cerebri.

INTRODUCTION

Gorlin–Goltz syndrome (GGS) or Nevoid Basal Cell Carcinoma Syndrome (NBCCS) is a rare autosomal dominant hereditary disorder. It was first reported by Jarish in 1894 who described a patient with multiple basal cell carcinomas, scoliosis and learning disability. Howell & Caro were the first to associate the basal cell nevus with other cutaneous disorders and anomalies, while in 1960 Gorlin & Goltz defined the condition as a syndrome comprising the principal triad of multiple basal cell nevi, jaw keratocysts, and skeletal anomalies. It is also called as the fifth phakomatosis due to the presence of multiple cutaneous, skeletal, ophthalmic and neurological abnormalities.

The NBCCS prevalence has been variously estimated as 1 in 57 000 to 1 in 164 000, but there is now general agreement that the prevalence is about 1 per 60 000[1]. NBCCS probably seen in all ethnic groups, but most reports have been in whites. Males and females are equally effected with common presentation during first, second and third decades of life. Early diagnosis of GGS is of great importance due to susceptibility of affected individuals to multiple neoplasms of skin and brain (medulloblastoma) at an early age; Hence sound knowledge in diagnostic criteria and common clinical manifestations of syndrome will help in early diagnosis and provide better prognosis from the existent and susceptible diseases.

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CASE REPORT

A 35 years old male patient reported with a complaint of pain over upper right back teeth region and discharge of pus from right cheek region for the past 10 days. Patient had a history of swelling over right cheek region eight years back for which he underwent extraction of impacted maxillary third molar. He gave history of alleged fall from bike 10 days back following which he had developed pain in right maxillary posterior tooth region and discharge of pus from extraoral sinus (fig 1). Patient also gave history of intermittent yellowish discharge from the palatal aspect of second molar. On general examination, drooping of shoulders were noticed (fig 2). Patient was unable to raise his shoulders completely and restricted neck movements were noticed. On examination of the palms, multiple areas of pin-point sized pits were observed (fig 3). Multiple nevui can be noticed over chest and extremities.

On extraoral clinical examination, there was a swelling with sinus tract and pus discharge over right cheek region (fig 1). Swelling was approximately 4.8 X 5 cm in dimensions; The overlying skin colour was normal. On palpation, the entire surface of swelling was found to be smooth and non tender. Yellowish discharge was seen distal to the right 2nd molar. On intraoral examination no significant swelling seen leading to vestibular obliteration.

On radiological examination, Orthopantomograph shows multiple well defined radiolucent areas maxilla and mandible. Computed tomography scan showed hypodense areas in the maxilla bilaterally (Fig 6). Evidence of involvement of maxillary sinus bilaterally. Para nasal sinus view (Fig7) and Computed tomography brain demonstrate calcified falx cerebri. Chest radiograph revealed bifid ribs(Fig 8).

Incisional biopsy was performed at right retromandibular region and right maxillary posterior region under local anesthesia and histopathologically there were a characteristic well defined 6-8 layered parakeratinised stratified squamous cystic lining epithelium of uniform thickness thrown into corrugations indicative of odontogenic keratocyst. (Fig 9). Under general anesthesia all the odontogenic keratocyst present in maxilla and mandible were enucleated.

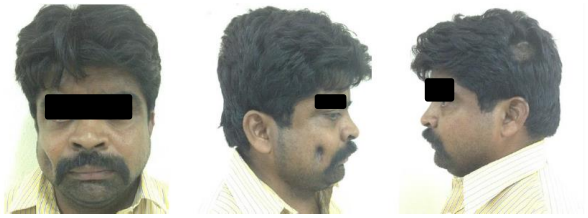

Fig 1: Frontal and profile pictures of patient showing extraoral sinus opening and swelling.

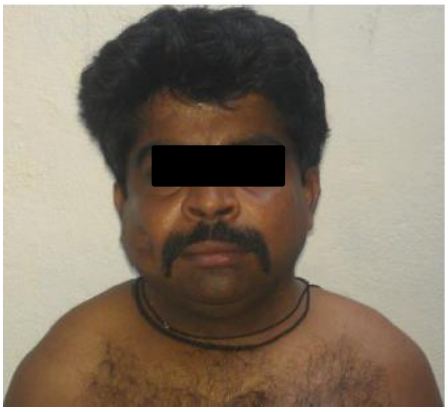

Fig 2: Picture depicting drooping of shoulders.

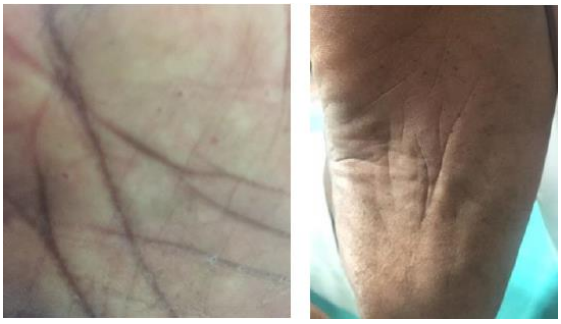

Fig 3: Showing pin point palmer and planter pits.

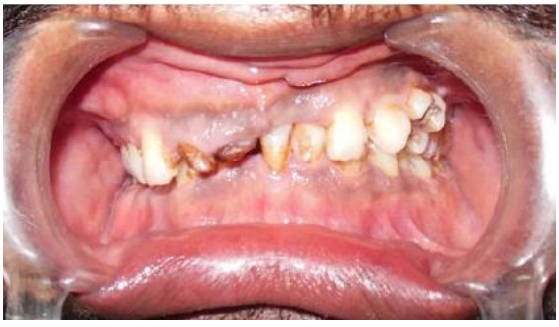

Fig 4: Showing intra oral status.

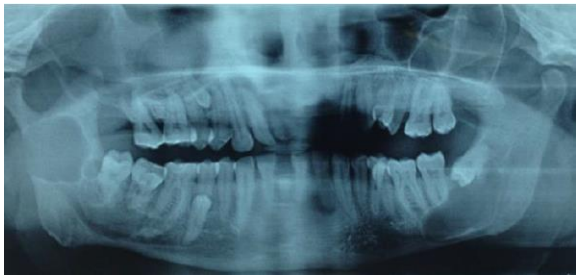

Fig 5: Panoramic radiograph revealing multiple radiolucencies.

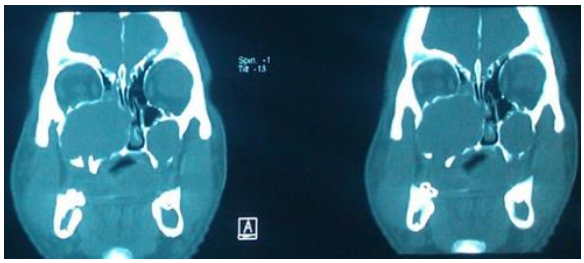

Fig 6: coronal sections of CT showing hypodense area at maxillary sinus bilaterally.

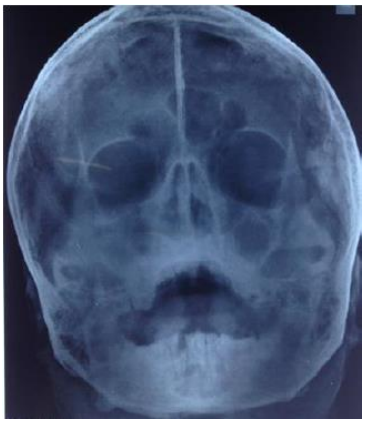

Fig 7: PNS view showing Calcification of Falx cerebri.

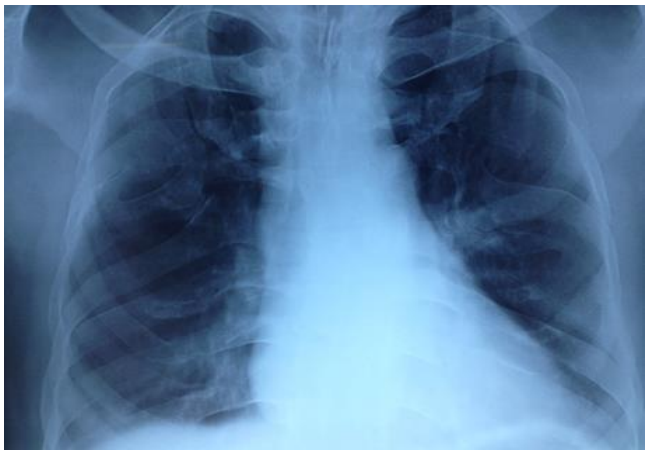

Fig 8: Chest X ray showing bifid ribs.

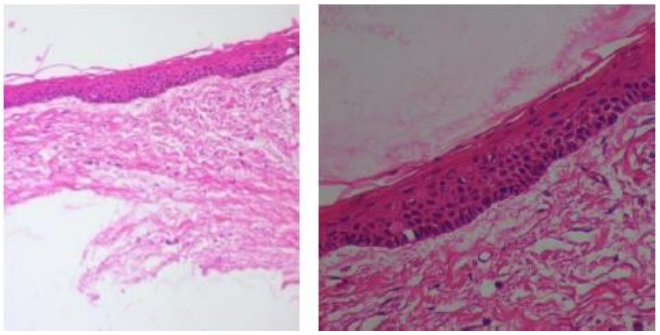

Fig 9: Histopathological report

DISCUSSION

Evans et al[6] first established major and minor criteria for diagnosis of this rare entity, later modified by Kimonis et al[7]. These criteria can help guiding the clinician's laboratory evaluation for both diagnostic purposes and routine follow up. The principal clinical features of NBCCS comprise multiple odontogenic keratocysts (OKCs), basal cell naevi and skeletal anomalies, particularly of the thoracic cavity. The diagnostic criteria of NBCCS are summarized in (Table 1)

Skin lesions

The most frequent skin lesions of NBCCS are cutaneous basal cell carcinomas(BCCs). Epidemiological studies[8] suggest that sunlight, and particularly UVB radiation, is a strong risk factor for the formation of BCC. The relatively low frequency of these lesions in African-Americans probably reflects the protective action of melanotic pigmentation from ultraviolet light[9]. The basal cell carcinomas of NBCCS have a spectrum of clinical presentations varying from light to brown dark papules, with a smooth surface and hard consistency, to pigmented ulcerative plaques[12] of 1 mm to 10 mm diameter, mostly affecting thoracic and cervico-facial skin. Histologically BCCs in NBCCS cannot be differentiated from BCCs unrelated to NBCCS. A spectrum of other cutaneous anomalies can arise, particularly sebaceous cysts (arise in 20% of patients)[13] and pits of the palms and soles arise in 50–65% of patients[9] (Table 2). Usually 1–3 mm in depth and 2–3 mm in diameter.

Odontogenic keratocysts

Odontogenic keratocysts (OKCs) arise in up to 75% of patients with NBCCS[14] (table 2).The OKCs

in NBCCS usually comprise unilocular and/or multilocular radiolucencies of the posterior body, angle or ramus of the mandible often bilateral although can be unilateral[14]. The OKCs are locally destructive, spreading within the bone and causing little lateral expansion.

Skeletal anomalies

Almost 70% of patients with NBCCS have some degree of cranio-facial anomaly (table 2). This can comprise a high and broad forehead, frontal and parietal bossing, sometimes with high arched eyebrows. A broad nasal root is common and may be associated with ocular hypertelorism [9,13] The maxilla may be hypoplastic and there may be mandibular hyperplasia with variable prognathism[9,13]. Other less common anomalies include a high arched palate, cleft palate and lip (4%) [24] malocclusions, impaction and agenesis of teeth[9,13]. Thoracic cage anomalies are common (43%) particularly bifid and fused ribs (table 2). Vertebral anomalies can arise in up to 31% of patients and can include spina bifida occulta, kyphoscoliosis, fusion defects and hemi vertebrae. A marked syndactyly of toes and polydactyly may rarely occur (3%). Ectopic calcification (65–92%) of the falx cerebri, tentorium cerebelli and bridged sella may also be detected radiologically (table2

Table 1: The diagnostic criteria of Nevoid Basal Cell Carcinoma Syndrome. (Evans et al[6] 1993)

The diagnosis of NBCCS requires the presence of two major, or one major and two minor criteria:

Major criteria:

1. More than two basal cell carcinomas (BCC) or one BCC under the age of 20 years
2. Histologically proven odontogenic keratocyst of the jaw
3. Three or more cutaneous palmar or plantar pits
4. Bifid, fused or markedly splayed ribs
5. First degree relative with NBCCS

Minor criteria:

1. Proven macrocephaly, after adjustment for height
2. One of several orofacial congenital malformations: cleft lip or palate, frontal bossing, "coarse face", moderate or severe hypertelorism.
3. Other skeletal abnormalities: Sprengel deformity, marked pectus deformity, marked syndactyle of the digits
4. Radiological abnormalities: Bridging of sella turcica, vertebral bodies, modeling defects of the hands and feet, or flame shaped lucencies on the hands or feet

Table 2: percentages of commonly features in syndrome

Clinical features	Percentage	References
Skin lesions:		
BCC	80% - White 38%- Blacks	Goldstein et al[13] 1993 Kimonis et al[7] 1997
Sebaceous cyst	20%	
Palmer and planter pits	50-60%	Goldstein et al[13]1993
KCOT	75%	Eposito et al[14]1995
Ectopic calcification of falx cerebri	65-92%	Eposito et al[14]1995 Gorlin and Goltz[3]1960
Skeletal anomalies (high and broad forehead, frontal and parietal bossing, hypertelorism)	70%	Howell et al[2] 1959
High arched palate or cleft lip and palate		Jarish et al[1] 1994
Thoracic cage deformities like bifid and fused ribs	4%	Goldstein et al[13]1993
Vertebral anomalies like spina bifida	43%	

occulta, kyphoscoliosis, fusion defects and hemi vertebrae.	31%	

In the present case four major manifestations such as odontogenic keratocyst in both upper and lower jaw, fused second rib, ectopic calcification of falx cerebri, and palmer and planter pits were identified which fits in to be Gorlin-Goltz syndrome.

CONCLUSION

The present case highlights the importance of early diagnosis of this rare syndrome without skin lesions and management strategy. Diagnosing this syndrome needs thorough clinical and radiological examination in early stages of life. This require multi speciality approach involving Pediatricians, specialists in genetics, maxillofacial surgeons, dermatologists who should have good basic knowledge of the condition.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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