Granular cell tumor (GCT) is described to be an uncommon benign neoplasm. It was first described nearly a century ago by Abrikossoff in 1926. It was initially referred to as “granular cell myoblastoma” owing to its presumed origin from skeletal muscle. Since its earlier description, several theories on the origin have been proposed, the latest citing a neural origin, possibly of the Schwann cells or their precursors.\[1-5\]

GCT has been reported to affect any human organ system or region; most of the lesions occur as a peripheral lesion in the head and neck region.\[1-5\] Central GCTs are still relatively rare, and only a handful of cases have been documented.\[6\]

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Case Report
A 13-year-old boy of Asian descent was referred to author’s center for the management of a radiolucent swelling in the right mandibular posterior region by his orthodontist. The orthodontic treatment was initiated approximately 9 months before presentation. Early diagnostic orthopantomogram (OPG) had enlarged follicles involving teeth 48 (FDI nomenclature). Mid-orthodontic treatment radiograph revealed a remarkable enlargement of the radiolucent region. Furthermore, at the same time, the patient presented with a mild, developing swelling along the right angle of region of the face. Subsequently, the patient was referred for the author for opinion and management.

Medical history revealed that the patient has a mild ventricular septal rupture that was effectively managed in the past. Currently, the patient was not under medical attention or medication. At presentation, clinically, there was a mild, diffuse, swelling in the right angle of the mandible. On intraoral examination, there was no visible swelling or expansion of the involved region. Regional lymph node examination was unremarkable. Imaging tests revealed the existence of a radiolucent lesion approximately 1 cm × 2 cm involving the entire right angle. The margins were diffuse and to be associated with the developing teeth 48.

Further, computed tomography (CT) study revealed involvement of the mandibular cortex at few isolated areas [Figure 1a and b]. Incisional biopsy was that of a nonspecific nonmalignant lesion with isolated areas showing islands of odontogenic rests. Following the same, an excisional biopsy was performed under...
general anesthesia. Entire lesion was completely excised with a wide margin, preserving the borders along with the removal of developing 48. The defect was closed with costochondral bone fixed in position with miniscrews and incision closed [Figure 2a and b]. Appropriate antibiotics and nonsteroidal anti-inflammatory drugs were prescribed.

In the histological sections, large round-to-polygonal to elongated cells closely packed tumor cells with abundant granular eosinophilic cytoplasm, and a small central, an oval or round, with isolated vesicular nuclei was observed. No areas of atypia or other abnormalities were noted [Figure 3]. Based on the histopathological picture, a diagnosis of GCT was made. The patient recovered fully and the defect is being filled with viable bone and currently remains disease free for more than 1 year [Figure 4].

**Discussion**

GCT is a rare tumor that may involve any part of the body but more commonly present in the head and neck region, especially the oral cavity. However, central lesions are very rare.[1-5] The lesion is less common in children. Studies by Rejas et al. and Vered et al. have shown that the tumors are most commonly neural in origin, though with inconsistency.[3,6,7] In the present case, the lesion was more of an incidental finding by an alert dental team which the parents of the patient heeded. This case underlines the need for early and frequent dental examination.

Although the incisional biopsy approached through the weak cortex was inclusive, it was clouded due to the presence of normal rests of odontogenic epithelium, which is a common finding in the posterior mandibular region, especially in the developing 48 tooth region. The differential diagnosis included cysts – notably odontogenic keratocyst, dentigerous cyst, and ameloblastoma (unicystic variant). It is pertinent to note that missing GCT diagnosis in incisional biopsies has also been reported earlier by Sena Costa et al., 2012.[3]

The histopathological picture of the excisional biopsy had striking features of GCT while efforts were also made to rule to solitary xanthogranuloma, central odontogenic granular cell tumor, that could resemble the histological picture.[8,9] Histologically, GCTs are characterized by the proliferation of large polygonal neoplastic cells with cytoplasmic granules, eosinophilic cytoplasm, and a small and eccentrically located nucleus. Diagnosis of GCT is nearly straightforward, unless complicated by the presence of other unrelated tissue architectures such as pseudoepitheliomatous hyperplasia.[10,11]

Fanburg-Smith et al. outlined six histologic criteria to be important for suspecting malignancy in GCTs – they are prominent necrosis, cell spindling, vesicular nuclei with large nucleoli, increased mitotic rate (>2/10 high-power fields), high nuclear-to-cytoplasmic ratio, and pleomorphism. They held that the presence of 3 or more criteria indicated malignancy while one or two indicate

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**Figure 1:** (a) Radiographic examination revealing radiolucent lesion involving entire right angle of mandible. (b) CT study revealing involvement of mandibular cortex at isolated areas

**Figure 2:** (a) Autologous rib grafts harvested. (b) Bony defects closed with placement of rib grafts

**Figure 3:** (a-c) Histopathology of lesion demonstrating abundant granular eosinophilic cytoplasm

**Figure 4:** (a) Immediate postoperative x-ray after resection of granular cell tumor. (b and c) One year postoperative x-ray and CT demonstrating defect filled with viable bone
Balaji and Balaji: 13-year-old with rare granular cell tumor

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Conflicts of interest
There are no conflicts of interest.

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Atypia.[12] By this definition, the present case fits into a benign GCT. The local recurrence of GCT within a year is characteristic for malignant GCT.[4] The 1-year follow-up of the present case indicated no local recurrence.

The present case is unique because of the early presentation and presenting a central lesion and presence of isolated odontogenic cell rests. For the present case, as the GCT was central, benign, and considering the age of the child, a wide margin excision was performed. The defect was closed with grafts that were taken uneventfully. Periodic follow-up is currently being done. It is recommended that surgical excision with a safety margin is the treatment of choice for GCT. It is not always possible as GCT, as in the present case, lacks a capsule, a condition histologically demonstrated by an undefined margin; hence, an excisional biopsy was also the treatment of choice in the present case.

Conclusion

GCT is an uncommon tumor that must be carefully and correctly diagnosed and treated. It should be considered in condition when clinical, radiological, and histopathological pictures do not concur. The present case also highlights the need for the continuous, periodical dental examination and the success of specialist reference when needed. It is an alert dental team that has identified and possibly instrumental in the success of the treatment.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.