

INTRAOSSEOUS CARCINOMA OF MANDIBLE: A CASE REPORT

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ABSTRACT

SCC arising primarily from the jaw bone having no initial connection with oral mucosa. The etiology is unclear, although cellular source of origin come from epithelial rests of Malassez present within the periodontal ligament, reduced enamel epithelium around the crown of unerupted tooth, rests of dental lamina in the gingival tissue or within the bone. We hereby report a case of intraosseous SCC involving the mandible of a 49-year-old male.

Key Words: Carcinoma, Jaw, Mandible

INTRODUCTION

Most cancers of the oral cavity are oral squamous cell carcinomas (OSCC), and use of tobacco, alcohol and betel become the main risk factors for these and many potentially malignant lesions (PML). The main high risk groups are older adult males who use tobacco and alcohol. It is expected that early diagnosis of oral cancer can reduce mortality. Early diagnosis of OSCC can speed proceeding to treatment and can improve the prognosis. This requires patients to seek an oral and dental examination at an early stage¹.

Squamous Cell Carcinomas arises primarily from the jaw bone having no initial connection with oral mucosa. The etiology is unclear, although cellular source of origin come from epithelial rests of Malassez present within the periodontal ligament, reduced enamel epithelium around the crown of unerupted tooth, rests

of dental lamina in the gingival tissue or within the bone.

Areas characterized by high incidence among males are found in central and eastern Europe, southern India, and Latin America. In addition, high rates are also observed among black males in the USA. In these areas, different combinations of risk factors, including tobacco smoking and chewing, alcohol drinking, and dietary habits probably account for the high incidence. Among females, the highest incidence is observed in India and the Philippines, with a clear predominance of cancer of the oral cavity. The habit of chewing betel quid is equally common in the two sexes³. In India, Bangalore, the incidence rate of oral cancer in women exceeded that of males.⁴

The incidence of oral cancer among males is extremely high in northern France, with a rate of almost 50 per 100,000 men.

CASE REPORT

A 49-year old male reported to Department of Oral Medicine and Radiology, in Teertharkar Mahaveer Dental College with a chief complaint of decrease mouth opening and pain while eating food in right lower back tooth region since 1 year (Figure 1,2,3). Patient further gave the history of chewing gutkha 5 to 6 packet per day for past 15 to 16 year. On Oral examination there was decrease mouth opening with opening of 10mm and tongue protrusion of 20mm (approx.), on impaction buccal mucosa was blanched and appear as wet leathery and uvula appear as bud shape, on palpation vertical, horizontal and circumoral band were palpable. On examination of submandibular lymph node, the node was firm and fixed. Medical and family history was non-contributory. On the basis of habit history and clinical examination provisional diagnosis of oral submucous fibrosis stage IV was given and patient was advised for blood investigation and OPG (Figure 4). OPG revealed well define radiolucent area in right ramus region measuring about 4 cm × 3 cm in diameter extending from neck of the condyle and coronoid process superiorly ascending downward to the inferior border of ramus. Anteriorly involved 47, 48 region and extends posteriorly the posterior border of ramus margin. The lesion was ill-define with absence of cortication, and have a border that demonstrates osseous destruction and varying degrees of extension at the periphery 47, 48 appear as floating tooth, there is complete loss of lamina dura of 47, 48. All the blood picture were under normal limits. Further patient was advised for incisional biopsy. Biopsy revealed presence of dysplastic cells invading underlying connective tissue stroma, with

marked pleomorphic cells and nuclei, altered nuclear-cytoplasmic ratio, numerous keratin pearl formation, individual cell keratinization, loss of cohesion and occasional mitotic figures. The histopathological it came out to be moderately differentiated SCC (Figure5).The origin of squamous cells can be from the oral mucosa or from within the bone.

Based on the history and the findings obtained on the conventional radiographs, the differential diagnosis of primary malignancy (Epithelial in origin – SCC, intra-osseous carcinoma, Connective tissue in origin – Sarcomas), secondary malignancy (metastasis) was given.

SCC is the most common malignant tumor of the oral cavity. It can arise from the epithelium of oral cavity or *de novo* from the bone or from the epithelial cell rests or from epithelium of odontogenic lesions like cysts and ameloblastoma. Sarcomas arising in jaw bones include osteosarcoma and chondrosarcoma. Chondrosarcomas rarely found in jaws and occurs in anterior alveolar process of maxilla and at angle and alveolar ridge of premolar-molar region of mandible. However, it is slow growing and painless in early stages. Osteosarcoma is most common primary malignant tumor of bone and among the jaw bones occur most commonly in the body of mandible. However, it is rare in jaw bones accounting for only 7% among all osteosarcomas with most frequent associated in long bones. It grows rapidly giving a moth-eaten appearance in initial osteolytic stage. The mean age of occurrence is 33 years. Since the patient had a history of smoking and the most common metastasis to jaw bones is from

lungs, a chest radiograph was taken, which came out to be normal. A bone biopsy was performed from 47, 48 region and was sent for histopathological examination. Hence, the final diagnosis was “SCC.”

DISCUSSION

In India and Southeast Asia, the use of betel quid, nass, mawa, and many other substances is strongly related to the development of oral cancer. Although rare in Western countries, it is seen in immigrants from these countries. Oral submucous fibrosis is a chronic, irreversible disease that usually involves the buccal mucosa, but may affect the entire oral cavity as well as the oropharynx. Initially, the earliest symptom of oral submucous fibrosis is a burning sensation while eating spicy foods. This progresses to blanching of the mucosa, hardening, and the presence of fibrous bands with limited mouth opening. The precancerous nature of submucous fibrosis was first noted by Paymaster and subsequently confirmed by Pindborg.⁵ In one study, a 7.6% malignant transformation rate was observed over a 17-year period.⁶ The pathogenesis of submucous fibrosis is considered multifactorial but is strongly related to the areca nut, which is a component of betel quid (pan). Typically pan is a betel leaf (*Piper betel*) onto which slaked lime is smeared and wrapped with areca nut (the fruit of the areca palm tree). Additional ingredients are added according to regional preferences, including tobacco, catechu, aniseed, and cardamon. Chewing the betel nut releases an active alkaloid, arecoline. This alkaloid has been shown to stimulate fibroblasts to increase collagen production *in vitro*. Other studies have linked

fibroblast stimulation to the enzyme lysyl oxidase, a metalloenzyme of copper, which is released when chewing areca nut. Again, it must be stressed that there are multiple components that must interact to result in submucous fibrosis. These include a genetic component, immunologic process, and nutritional deficiencies such as iron deficiency anemia and vitamin B complex deficiency. In recent years, the reported age distribution of submucous fibrosis has shifted to a younger population, with more than 70% of cases occurring in patients less than 35 years of age.⁷ This sudden increase in younger patients is thought to be related to commercially available products, pan masala and gutkha. Gutkha is a combination of powdered areca nut, tobacco, lime, preservatives, and flavoring agents, including chocolate, which can appeal to children. These products have been heavily marketed throughout India and other south Asian countries. The microscopic features of submucous fibrosis are characterized by epithelial atrophy, and diffuse hyalinization of the lamina propria with a marked decrease of ground substance and vascularity. Epithelial dysplasia can be seen especially in biopsies taken from erythroplakic lesions or from non-healing ulcers. The underlying skeletal muscle may show atrophy. Treatment of the disease depends on severity. Intralesional injections of steroid and interferon-g along with topical application of hyaluronidase have been used to improve mouth movements.⁸ Surgical intervention is required in patients with severe trismus.

Primary intraosseous carcinoma is a squamous cell carcinoma arising within the jaw that has no original connection

with the surface epithelium of the oral mucosa. These neoplasms are rare and may remain silent until they have reached a fairly large size and symptomatic. It is more common in men and in patients in their fourth to eighth decade of life. The surface epithelium is invariably normal in appearance.

Carcinomas account for about 96% of all oral cancers, and sarcomas for about 4%. The most common type of oral cancer is squamous cell carcinoma, which accounts for approximately 9 out of every 10 oral malignancies. It is known that, at a certain time a cell or group of cells may undergo uncontrolled growth. This capacity for disorderly division continues in daughter cells, producing a malignancy through subsequent spread and destruction of tissues and organs.

Humans are exposed continually and simultaneously to a broad spectrum of biological, chemical, and physical forces.

Smoking may be viewed as a worldwide epidemic, causing serious diseases and immense health problems. Apart from its effect on mortality, smoking results in a considerably increased morbidity rate with consequent losses in working days and productivity, excessive demand on medical services, and increased health expenditures. Tobacco was first introduced to western civilization by the Spanish explorers of America in the early 16th century. At first, it was simply smoked in pipes but, as it became more popular, it was also chewed and snuffed. Cigarettes were first made in Spain in the mid-17th century.

The mandible is far more commonly involved than the maxilla, with most cases being present in the molar region and less frequently in the anterior aspect of the jaws. Because the lesion is intraosseous and associated with remnants of the dental lamina, the periphery of the majority of lesions is ill-defined

Tumors that invade through cortical bone, into the deep (extrinsic) tongue musculature (genioglossus, hyoglossus, palatoglossus, and styloglossus), or invade the maxillary sinus or the skin of the face are designated T4a lesions.⁹ Superficial mandibular bone erosion is not sufficient to apply the T4 designation. Invasion of the masticator space, pterygoid plates, skull base, and/or internal carotid artery encasement result in the T4b designation.⁹ The T-stage distribution of patients presenting with Lower alveolar ridge(LAR) lesions is as follows: T1, 23 to 31%; T2, 36 to 45%; T3, 13 to 21%; and T4, 11 to 20%.^{10,11} The overall rate of clinically positive adenopathy is approximately 25% and is related to T-stage: T1 N+, 17%; T2 N+, 14%; T3 N+, 44%; and T4 N+, 44%.¹¹ Limited findings pertaining to the rate and pattern of occult nodal metastasis (ONM) in LAR cancer have been published. Eicher et al¹¹ demonstrated a 15% incidence of ONM in 127 patients staged T1 through T4 with a clinically negative neck. Ninety-three percent of the metastatic nodes were located in lymph node levels I or II, with the remaining 7% located in level III. In contrast, lymph node levels IV and V contained 10% and 11%, respectively, of the metastatic nodes that were identified in therapeutic neck dissections.

Differential Diagnosis

If the lesions are not aggressive and have a smooth border and radiolucent area, they may be mistaken for periapical cysts or granulomas. Alternately, if lesions are not centered about the apex of a tooth, occasionally it is difficult to differentiate this condition from odontogenic cysts or tumors. If the border is obviously infiltrative with extensive bone destruction, a metastatic lesion must be excluded, as well as multiple myeloma, fibrosarcoma, and carcinoma arising in a dental cyst. Examination of the oral cavity and especially the surface epithelium assists in differentiating this condition from surface squamous cell carcinoma.¹²

Management

Generally these tumors are excised with their surrounding osseous structure in an en bloc resection. Radiation and chemotherapy may be used as adjunctive therapies.

CONCLUSION

The appropriate evaluation and management of malignant lesions that originate from the Lower alveolar ridge frequently present clinicians with a variety of clinical dilemmas that can impact the ultimate outcome of therapy. Assessment

for early mandibular invasion requires the employment of diagnostic tests that are both sensitive and specific so that the under treatment of lesions that manifest mandibular invasion are eliminated and performing a segmental mandibulectomy for those lesions that do not invade the mandible is minimized. Candidates for mandibular conservation surgery should be carefully chosen to ensure that better postoperative function is not achieved at the expense of local-regional control. Postoperative Radiation Therapy, when indicated, must be administered to improve local-regional control and survival. Prospective evaluation of high-quality imaging studies that are obtained by using standardized imaging protocols should help to determine whether a single diagnostic test can be reliably used to detect or exclude mandibular invasion. Future research endeavors should separately report the treatment outcomes that are achieved for cancers of the Lower alveolar ridge, and a prospective randomized trial should be conducted to evaluate the outcomes following segmental mandibulectomy and mandibular conservation surgery.

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FIGURES:



Figure 1



Figure 2



Figure 3

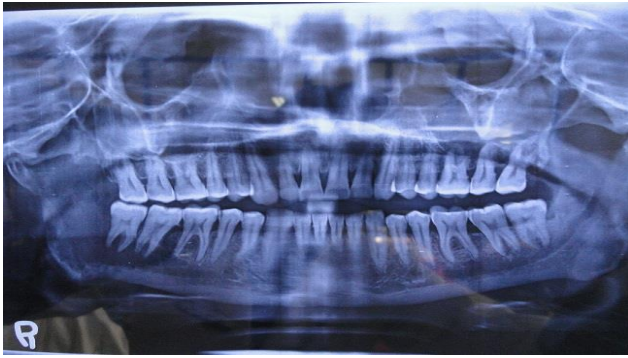


Figure 4

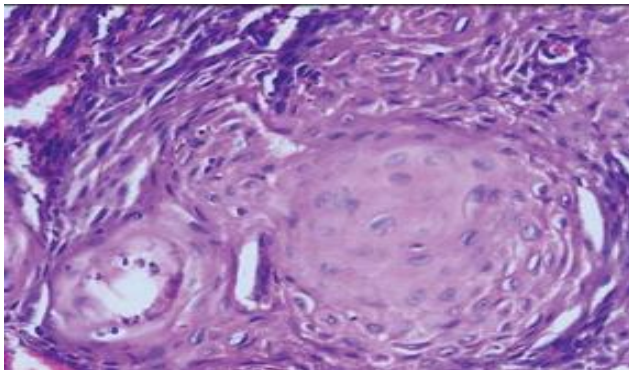


Figure 5