ABSTRACT

Paranasal sinus malignancies are exceedingly rare. Chronic respiratory tract infections, nasal congestive symptoms and rhinosinusitis are much more prevalent in recent days and manifest many symptoms that overlap with those of sinus malignancy. Symptoms may be nonspecific and indolent for months or even years, leading to delay in diagnosis and consequent advanced diseased stage at presentation. The majority of maxillary sinus tumors in the literature have presented with advanced stage, resulting in generally poor survival outcomes. Hence, it is imperative that maxillofacial stomatologist should be aware of sinus pathologies, to diagnose early and it should alert them to include in differential diagnosis.

Keywords: Squamous cell carcinoma, Maxillary sinus, X-ray tomography, Diagnosis.

INTRODUCTION

Maxillary sinus cancer is relatively rare neoplasm with an incidence representing a small percentage (0.2%) of human malignant tumors and only 1.5% of all head and neck malignant neoplasms.1 Because of the relative rarity of carcinoma of the maxillary sinus, institutional experience is usually limited. The incidence seems to vary in different parts of the world, with Asian countries reporting high numbers of cases.2 Maxillary sinus cancer is very difficult to treat and traditionally have been associated with a poor prognosis. One reason for these poor outcomes is the close anatomic proximity of the nasal cavity and paranasal sinuses to vital structures, such as the skull base, brain, orbit and carotid artery. This complex location makes complete surgical resection a challenging and sometimes impossible task. In addition, these tumors tend to be asymptomatic at early stages, appearing more frequently at late stages once extensive local invasion has occurred.

CASE REPORT

A healthy 50-year-old man was referred to our oral medicine department with the chief complaint of pain and swelling of the left maxillary quadrant with nasal discharge. The patient had just completed a 5 days course of antibiotics and analgesics for a presumed infection of odontogenic origin with minimal improvement in his symptoms. His medical history revealed a 3 pack/day, cigarette/beedies smoking habit since childhood. He also had a habit of using nasal snuff. Patient is on treatment for cough and chest pain since 5 years. Patient gave a history of tooth removal for mobility 5 days back in same quadrant and ulcer in relation to same post-treatment.

Clinical examination showed a moderately firm soft tissue swelling in the area of the left maxillary region; its maximum dimension measured 2 cm (Fig. 1A). The lesion was mildly painful to palpation. Lymph node blocks on the neck did not have any positive sign.

On further questioning, the patient reported slight paresthesia involving the distribution of the left posterior superior alveolar nerves. Ulceroproliferative growth measuring around 4 × 4 cm in maximum diameter was noted in relation to 25, 26, 28 region, some purulent drainage was obtained from the unhealed extraction socket in relation to 26, 27 (Fig. 1B). Generalized attrition, cervical abrasion and mobility were noted.

A preliminary panoramic radiograph revealed missing 26, 27 and 16 and few decayed teeth and generalized moderate to severe periodontal bone loss. A poorly defined opacification was noted in the area of the left maxillary sinus. The floor, roof and posterior and medial walls of the left maxillary sinus appeared to be destroyed (Fig. 2).

Water’s view showed that the opacification of the left maxillary sinus has expanded to involve the entire left maxillary region; its maximum dimension measured 2 cm (Fig. 1A). The lesion was mildly painful to palpation. Lymph node blocks on the neck did not have any positive sign.

In view of paresthesia and growth in the area of complaint, a biopsy of the involved areas was deemed necessary.


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Well-differentiated Squamous Cell Carcinoma of Maxillary Sinus

Fig. 1A: Extraoral photograph taken clinically. Substantial expansion is apparent over the area of the left maxillary sinus

Fig. 1B: A sizable intraoral mass is evident in the area of the left maxillary buccal sulcus. Extending palatally involving alveolar ridge

Fig. 2: Panoramic radiograph reveals a poorly defined opacification located in the area of the left maxillary sinus. The inferior, posterior and medial walls of the left maxillary sinus and the left orbital floor all appear to be destroyed

necessary to rule out the possibility of an underlying malignant process. Surgical exploration of the area revealed an irregular $1 \times 1$ cm bony defect filled with granulation-like tissue on the posterior-lateral wall of the left maxillary sinus. This soft tissue was submitted for histopathological examination.

Microscopic examination of the biopsy specimen revealed pseudostratified epithelial cells with signs of dysplasia. Invading the deeper connective tissue in the form of well-differentiated squamous cell carcinoma, showing numerous keratin pearls (Figs 5A and B).

A diagnosis of well-differentiated squamous cell carcinoma was reached. The patient was referred to the head and neck surgery department for further treatment and explained about the surgery, chemotherapy and brachytherapy. Patient declined of treatment due to poor socioeconomic background. Patient was advised on for palliative therapy. Later, the patient succumbed within an 8 months time.

DISCUSSION

Maxillary sinus carcinoma presents a diagnostic and therapeutic challenge to the oral diagnostician, surgeon and as well as the radiation oncologist. The early symptoms are generally vague and consistent with benign disorders. When the tumors are small sized, they are misdiagnosed as chronic sinusitis, nasal polyp, lacrimal duct obstruction or even cranial arteritis.3

In general, clinical examination of patients presenting with pain and swelling of the jaws will reveal lesions of dental etiology, most commonly related to pulpal or periodontal pathology. However, when such situation exists, it is mandate that dental practitioner must consider the possibility of a nonodontogenic etiology. It is often better to determine first, by clinical and radiographic examination, whether the enlargement originates primarily in bone or in the extraosseous soft tissue. An infection of odontogenic origin is the most common cause of a soft tissue swelling of the maxillary buccal vestibule. Second, the possibility of a malignant neoplasm of the maxillary antrum, although uncommon, should be considered.

In the present patient’s case, extensive dental decay and periodontal disease (mobility of 26, 27), it would have initially felt that this swelling was most likely the result of an acute dental abscess secondary to pulpal involvement. The previous dentist has extracted the teeth. The associated soft tissue swelling was the result of tumor expansion through a defect in the posterolateral wall of the left maxillary sinus. In 40 to 60% of cases, there are facial asymmetry, oral cavity swelling and tumor extension to the nasal cavity. These lesions extend medially toward the nasal cavity; superiorly they may invade the orbit and ethmoid sinus; anterolaterally, they may reach soft tissues and cheek, and inferiorly, the maxillary sinus floor, dental alveolus and
Symptoms that are commonly noted with involvement of the sinonasal complex include maxillary swelling, epistaxis, nasal obstruction or discharge, diplopia and proptosis. When these classic signs are not present, the possibility of a malignant tumor may be overlooked.\textsuperscript{5,6}

In the given case, patient had maxillary swelling, nasal discharge and paresthesia of the involved nerve. Signs that should alert the clinician to the possibility of a malignant tumor include paresthesia, radiographic evidence of irregular bone resorption and localized irregular widening of the periodontal ligament. Among these, paresthesia is an ominous sign. Although paresthesia can be related to nerve palate. Posteriorly, they may reach the pterygopalatine fossa and pterygoid muscles. Through the pterygoid fossa, they may superiorly extend toward the orbital fissure and the cavernous sinus.\textsuperscript{4}

Fig. 3: Water’s view shows the opacification of the left maxillary sinus has expanded to involve the entire left maxillary sinus. Intraoral extension of this mass is also evident. The inferior, posterior, lateral and medial walls of the left maxillary sinus

Fig. 4A: Axial view CT with soft tissues window. Heterogeneous, expansive lesion, with infiltrative aspect, centered on the left maxillary sinus

Fig. 4B: Coronal view CT with osseous window. Expansive lesion of left maxillary sinus with medial and anterolateral walls erosion

Fig. 5A: Low power photomicrograph (10×) showing antral wall lining. The epithelial cells are pseudo stratified with signs of dysplasia

Fig. 5B: Low power photomicrograph (10×) showing dysplastic epithelium invading the deeper connective tissue in the form of well differentiated squamous cell carcinoma showing numerous keratin pearls
Well-differentiated Squamous Cell Carcinoma of Maxillary Sinus

In the present case, the clinical examination of lymph nodes was not palpable for any positive sign toward malignancy. This low incidence may be associated with the poor lymphatic draining of the maxillary sinus or with the clinical inaccessibility for the affected lymph nodes diagnosis. Lymph node blocks on the neck as an initial presentation are not frequent, appearing in 3 to 20% of cases. The topographic distribution of lymph node metastasis in the neck usually is dependent on the tumor site, contiguity and high number of capillaries. However, invasion of the parts with rich lymphatic network, such as the oral cavity and nasopharynx, increases the risk of lymph node metastases.

In majority of patients, this cancer is diagnosed in advanced stages, making it difficult to determine the origin of the neoplasm. Although the majority of maxillary sinus carcinomas are locally advanced at diagnosis because its symptoms are nonspecific and these tumors tend to remain localized to maxilla for a long time and, during evolution, they invade adjacent structures. The most effective barrier against tumors propagation is the integrity of the peristeme that is particularly more resistant in two critical areas: The skull base and orbit. Destruction of maxillary sinus walls, especially the inferior antral wall, can be identified by panoramic radiography. In advanced cases, this imaging modality may not show evidence of early bone destruction. CT and magnetic resonance imaging (MRI) is the examination of choice in such situation. CT provides more details of bone involvement than MRI. At MRI, these tumors present middle signal intensity on T1-weighted images and high intensity signal on T2-weighted images, and this method is of help in the evaluation of the posterior cranial fossa, orbit and perineural/perivascular dissemination, allowing the differentiation between retained secretions and neoplastic tissue.

CT helped us in arriving at preliminary diagnosis, but histopathological examination of biopsied tissue gave a definitive diagnosis. However, detailed analysis of histological findings is beyond the scope of this article.

When formulating a differential diagnosis for maxillary sinus carcinoma, it is mandate to include primary sinonasal neoplasms (e.g. sinonasal undifferentiated carcinoma, nasopharyngeal carcinoma, lymphoma, esthesioneuroblastoma, primary sinonasal melanoma and adenocarcinoma of minor salivary gland origin) and metastatic disease. Treating maxillary sinus cancer is challenging because of the crowded anatomy, proximity of critical structures, such as the eye and the brain, which preclude wide surgical excision and high-dose radiotherapy. The clinical course is indolent at most and low incidence of malignant disease here, which makes a low index of suspicion, the majority of cancers of antrum are seen in a late or moderately advanced stage at the time of diagnosis. Combined-modality therapy consisting of surgery and radiotherapy with or without intra-arterial chemotherapy is generally used for the treatment. Local control is a particularly difficult problem, with the majority of failures occurring at the primary site. Radiotherapy is accepted as a palliative method in inoperable cases.

Ohngren’s line is the theoretical plane joining medial canthus of the eye with the angle of the mandible. This line divides the maxilla into the infrastructure and superstructure (Fig. 6). It was originally described by Dr Ohngren in 1930 to delineate the limits of resectability of a tumor in the maxillary sinus. Tumors superoposterior to Ohngren’s line were more likely to involve the orbit, ethmoid and pterygopalatine fossa. Malignancy behind Ohngren’s line is regarded to carry a much poorer prognosis because of the rapid spread to the orbit and middle cranial fossae.

Maxillary sinus is at cross roads of dentistry and otorhinolaryngology occupying a strategic position, as it is connected directly to nasal cavity and indirectly to oral cavity and maxillary alveolus. Oral diagnosticians should be aware of the clinical signs and symptoms that might lead one to suspect a malignant tumor might be relatively nonspecific, potentially leading to a delay in diagnosis. Therefore, it is important for the oral diagnostician to maintain a high index of suspicion to allow for early detection of the disease.
One should have eagle’s eye in all cases involving swellings of the head and neck. In the presence of signs, such as pain and swelling with associated paresthesia, or if conventional therapy fails to resolve the swelling rapidly, prompt referral for biopsy is needed to arrive at definitive diagnosis. It is mandate to advise advanced imaging techniques, such as CT and MRI, when conventional radiography fails to help in diagnosis at the early stage of disease.

REFERENCES


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