Intraosseous Schwannoma of the Mandibular Symphysis: Report of a Case

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Abstract: Schwannoma is a benign neoplasm originating from the neural sheath and occurs most commonly in the soft tissues of the head and neck. Intraosseous schwannoma in the maxillofacial region is extremely rare. The present study reports the case of an intraosseous schwannoma located in the mandibular symphysis of a 27-year-old male patient. The tumor was completely excised, and there has been no evidence of recurrence in the nearly two years since the operation. A review of the related literature is also included.

Key words: schwannoma, mandible, intraosseous schwannoma

Introduction

Schwannoma is a benign neoplasm of neuroectodermal derivation that originates from Schwann cells, which cover the peripheral nerves. Approximately 25 to 40% of all schwannomas occur in the head and neck region. These tumors most commonly arise in the soft tissues of the head and neck, and on the flexor surfaces of the upper and lower extremities. Intraoral schwannomas account for 1% of all head and neck region tumors, and are commonly seen at the base region of the tongue. Intraosseous schwannomas are rare, and lesions of the mandibular symphysis are extremely rare. In the present report, we present a case of intraosseous schwannoma occurring in the mandibular symphysis.

Case Report

A 27-year-old male patient was referred to our department by his orthodontist regarding a radiolucent area in the mentum on a panoramic radiograph. The patient was symptom-free and reported no history of pain or paresthesia. The facial appearance was symmetrical. A clinical intraoral examination revealed a slight anterior mandibular buccal expansion. A panoramic radiograph showed a well-circumscribed, unilocular, radiolucent lesion 2 cm in diameter, inferior to the apical roots of the incisor teeth of the mandible (Fig. 1). A computed tomography (CT) scan
showed an $18 \times 20 \times 22$ mm mass between the bilateral mental foramens (Fig. 2). All of the lower incisor teeth were vital. Clinically and radiographically, the diagnosis of an intraosseous benign tumor was made.

The physical and laboratory examinations were all within normal limits. Under general anesthesia, a buccal mucoperiosteal flap was elevated and a bone window was created to gain access to the tumor. The tumor was completely removed. After complete surgical enucleation was performed, the residual bone bed was sterilized. No resorption of the apexes of the inferior incisor teeth was noted. The pathological diagnosis was a schwannoma. The patient tolerated the surgical procedure well, and did not experience any postoperative complications. The patient was followed up for 22 months and developed no recurrence of the tumor.

**Histopathological Findings**

Microscopically, the tissue consisted of encapsulated, well-demarcated tumor lobules. There were numerous elongated eosinophilic tumor cells with primarily spindle-shaped nuclei, showing a palisading pattern of Antoni type A tissue (Fig. 3). Velocay bodies were seen. Immunohistochemically, the tumor cells were positive for S-100 protein (Fig. 4). The pathological diagnosis was schwannoma, Antoni type A.

**Discussion**

Less than 1% of all neoplasms arising in the bone are intraosseous schwannomas$^{4,5}$ which are a rare type of primary bone tumor. The most common site of involvement is the mandible and sacrum$^{1,6,7}$. The majority of reported cases involving the mandible showed a more posterior location, corresponding to the intraosseous course of the inferior alveolar nerve$^8$.

Clinically, schwannoma is a slow-growing tumor that may be present for years before becoming symptomatic$^4$. Swelling is the most common symptom, but pain or paresthesia may be present in approximately 50% of cases$^4$. A survey of the English and Japanese literature revealed 57 verified cases of intraosseous schwannoma of the mandible, including the present case$^{3,8-12}$. Data regarding gender were available for 53 of the 54
patients. There is a female predilection, with a 1.4:1 female-to-male ratio. Age data were available for 54 of the 56 patients; the average age was 33 (range: 5–86 years of age), and 69% of the patients were below the age of 40 at the time of diagnosis.

In the present survey series, several cases involved the premolar or molar region of the mandible. There are three mechanisms by which schwannomas may involve bone: 1) a tumor may arise centrally within the bone, 2) a tumor may arise within the nutrient canal and cause canal enlargement, or 3) a soft tissue or periosteal tumor may cause secondary erosion and bone penetration. The relatively high incidence of schwannoma in the mandible has been attributed to the long intraosseous path of the mandibular nerve, which is predisposed to metaplasia of Schwann cells in its nerve sheath. The present patient had no pain or paresthesia of the mental nerve region, and the lower incisor teeth were vital; therefore, the tumor was believed to be unassociated with the mental nerve.

In the present survey series of mandibles, only 12 cases including the present patient involved the anterior teeth area of the mandible. In the majority of the 12 cases, the tumor involved the teeth or mental nerve, and therefore the present patient who showed no relation with the teeth or nerve, was extremely rare. Koutourousiou et al. reported an extremely rare case of intrasellar schwannoma because there are no nerves running within the sella turcica. According to Bleys, the human cavernous sinus contains an extensive nerve plexus with small ganglia and many connections with recognized cranial nerves. The presence of a connection between the lateral sellar plexus and functionally defined neural structures suggested that the plexus receives sympathetic, parasympathetic and sensory contributions. Therefore, Koutourousiou et al. suggested that an intrasellar schwannoma could originate from this plexus and, due to the fragility of the medial wall of the cavernous sinus, appeared to arise within the sella turcica as an intrasellar extension from the cavernous sinus. In the present case, we were unable to clearly identify the origin of this tumor.

Histopathologically, the tumor tissue consisted of Antoni A and B type areas. Type A tissue shows densely packed, elongated spindle cells, while type B tissue has a more myxoid consistency. The Antoni A zone has parallel-formed thin reticulin fibers, fusiform-shaped cells, and a curled nucleus. In general, the zone includes a variety of different cells without apparent borders among the cytosols. Among the sheets, there are acellular eosinophilic bodies or Verocay bodies, formed by thin cytoplasmic fibers. Antoni B area is a hypocellular zone with a loosely textured matrix, and
the tumor cells are haphazardly arranged. The present case lacked an Antoni B area. Immuno-

histochemically, the cytoplasm of the tumor cells was diffusely immunoreactive to S-100 protein in
the majority of reported cases of schwannomas\textsuperscript{17}. The diffuse and strong immunoreactivity to S-100 protein in the present case supported the histological diagnosis and the benign nature of the tumor.

The standard treatment for such tumors is a conservative surgical excision with no evidence of any cases of recurrence\textsuperscript{18}, and malignant change is very rare\textsuperscript{18}.

We herein described an extremely rare case of intraosseous schwannoma of the mandible treated by surgical enucleation.

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References