

Mandibular Osteoma in a Brown Bear (*Ursus arctos*)

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Abstract: A 21-year old, 150-kg male Brown bear, kept in Karacabey Bear Sanctuary in Bursa, Turkey, (*Ursus Arctos*) with an osteoma of the left mandible is presented. A large mass, causing significant facial asymmetry, on the mandible was detected. On palpation, the mandibular mass was very firm and immobile. Macroscopically the mass was non-hyperemic, spherical and smoothly contoured, whitish colored, hard and was 9 cm in diameter and covered by gingival mucosa. Microscopically, the tumoral mass on the mandible was covered with a layer of keratinized squamous epithelium. In deeper layers, bony islands of various shape and size were encountered. Some of them were compact, while some of them were trabecular. No mitotic figures were observed. The clinical and pathological findings were found compatible with osteoma.

Key Words: Brown bear, mandible, osteoma, pathology, *Ursus arctos*.

Kahverengi Ayıda Mandibular Osteoma Olgusu

Özet: Bu çalışmada, Bursa'nın Karacabey Ayı Koruma Barınağında bulunan 21 yaşındaki 150 kg ağırlığında erkek bir kahverengi ayıda (*Ursus Arctos*), sol mandibulada bulunan osteoma tümörü tanımlanmıştır. Mandibulada belirgin yüz asimetrisine neden olan kitle palpasyonda, sert ve hareketsizdi. Makroskopik olarak kitle hiperemik olmayan, küresel ve düzgün şekilli, beyazımsı renkli, sert ve 9 cm çapındaydı ve diş eti mukozası ile örtülmüştü. Mikroskopik olarak, mandibuladaki tümöral kitle, keratinize skuamöz epitel tabakası ile kaplıydı. Epitel tabakasının altında, çeşitli şekil ve büyüklükteki kemik doku adalarına rastlandı. Kemik dokunun kompakt ve trabeküler yapıdan oluştuğu görüldü. Alanda herhangi mitotik figürlere rastlanmadı. Yapılan klinik ve patolojik bulgular osteomayla uyumlu bulundu.

Anahtar Kelimeler: Kahverengi ayı, mandibula, osteoma, patoloji, *Ursus arctos*.

Introduction

Osteoma is a benign bony outgrowth of membranous bones. These tumors are uncommon and are found mostly on mandible, maxilla, nasal sinuses and cranium, and seldom in domestic animals, with a more common occurrence in horses and cattle.^{2,5,6,9,10} the tumor is

also seen in wild animals.^{1,4} Osteomas are slowly growing lesions that are normally asymptomatic.⁶ They only present if their location within the head and neck region cause problems with disfigurement, breathing, prehension and mastication, deglutition of food, vision and hearing.^{5,6,9} In this report, we describe a case of mandibular osteoma presenting with the complaint of facial asymmetry in a brown bear.

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Material and Methods

Physical examination was performed after chemical restraint using xylazine (Rompun® Dry Substance, Bayer, 2 mg/kg bw) + Ketamine HCL (Alfazine® 10%; 100mg/L, Alfasan, Turkey, 4 mg/kg bw), combination. For extraorally approaching and excision of the tumoral mass on the mandible, general anesthesia with xylazine (Rompun® Dry Substance, Bayer, 2 mg/kg bw) + Ketamine HCL (Alfazine® 10%; 100mg/L, Alfasan, Turkey, 4 mg/kg bw) combination, was performed. As there was no functional impairment of the left temporomandibular joint, no operative correction was performed of the enlarged condyle.

Findings

A 21-year old, 150-kg male Brown bear (*Ursus arctos*), kept in Karacabey Bear Sanctuary in Bursa, Turkey, was presented with a painless swelling of the left mandible (Figure 1). Keepers had noticed the swelling two weeks prior to the referral of the animal. The animal had good appetite, but had a significant facial asymmetry. A large mass was detected on the mandible. On palpation, the mandibular mass was very firm and immobile. Radiological examination could not be performed. Haematological and serum biochemical parameters were within normal ranges. Because of the facial asymmetry and the progression of the lesion, decision was made for operative correction. After operation, the mass was kept for histopathological examination. The tumor was cut with electric saw and tissue samples were fixed in 10% neutral, buffered formalin and then were decalcified by immersing the mass in 25% formic acid and formaldehyde mixture for 3 weeks. Then the tissues were routinely processed and embedded in paraffin. Paraffin embedded tumor samples were cut at 5 µm and stained with haematoxylin and eosin (H&E). Macroscopically the mass was whitish colored, spherical and smoothly contoured, 9 cm in diameter and covered with gingival mucosa. On the cut surface of the mass, sectioned with a saw, dense trabecular bone was found. Microscopically, the tumoral mass was covered with a layer of keratinized squamous epithelium of the gingiva. The mass was located under normal gingival epithelium. Under the gingival stroma, there was lamina propria, composed of dense collagen fibers. In deeper layers, bony islands of various shape and size were encountered. Some of them were

compact, while others were trabecular (Figure 2). The trabecular bones were seen peripherally, while the compact bones were centrally located. The compact and trabecular bones were formed by mineralized woven bone, with a basophilic matrix composed of randomly organized fibers, and bordered by a layer of connective tissue resembling the osteoblasts (Figure 3). The compact bones had no Haversian canals and bone marrow, while the trabecular bones had. The appearance of stroma was uniform throughout the sample and there was vascularized light connective tissue, including collagen fibers and fibroblasts between the trabecular and compact bone. No mitotic figures were observed.



Figure 1. The tumour (T), located in the left-mandible (arrow), was very firm and immobile

Şekil 1. Sol çenede (ok) oldukça sert ve hareketsiz tümör (T)

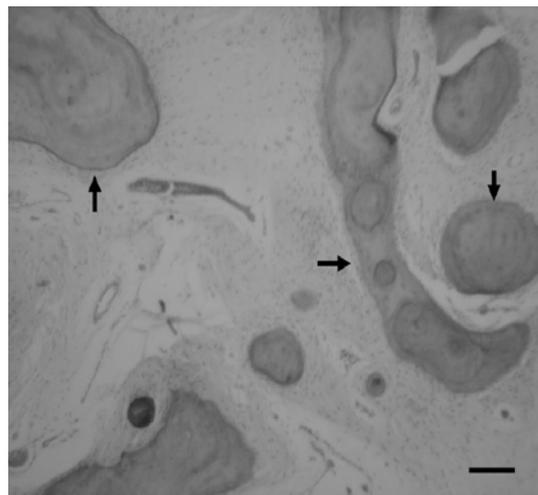


Figure 2. Compact bone of various shape and size (arrows), Bar= 90µ, H&E

Şekil 2. Farklı şekil ve büyüklüklerde kompakt kemik dokusu (oklar) Bar= 90µ, H&E

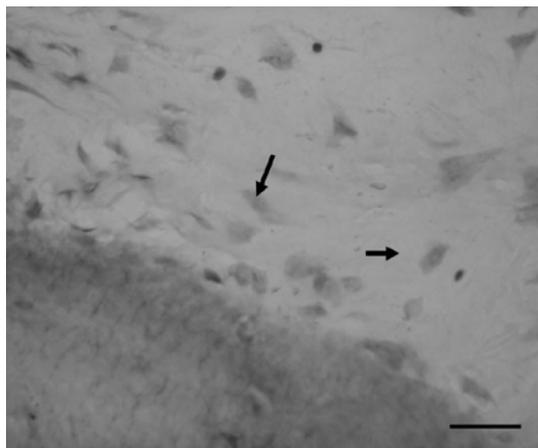


Figure 3. Light connective tissue (arrows) resembling osteoblasts surround the compact bone, Bar=22 μ , H&E

Şekil 3. Kemiği saran osteoblast benzeri yumuşak bağdokü (oklar) Bar=22 μ , H&E

Discussion

The osteomas are spherical, solitary and expansive growing tumors, which appear uncommonly in domestic species.^{6,7,10} The tumor may be seen in mandible, maxilla, nasal sinuses, bone of the face and cranium in domestic animals and may cause problems related to its location such as increased inspiratory noise and bilateral mucopurulent nasal discharge.^{2,5,6,9} However, in the present case, no functional loss was observed. Osteomas cannot be distinguished from exostosis macroscopically; therefore the location is important.³ In the present case, the location in the mandible, as well as the history, gross and histological features was consistent with an osteoma. Osteoma should be also differentiated from ossifying fibromas which have plump fibroblast forming whorls.^{3,6} In the present case, the stroma was uniform throughout the sample and there was vascularized loose connective tissue, including collagen fibers and fibroblasts^{3,5}. Furthermore, osseous elements were predominant rather than fibrous elements in this case. The appearance of matrix is related to the environment in which the tumor is settled.^{3,5,6,9} While the matrix of nasal osteomas has a mucoid appearance,^{5,9} the matrix of osteoma arising from mandible does not have a mucoid appearance.⁶ There are inconsistent

findings about the regrowth of osteomas following removal.^{8,9} In the present case, the bear is still under observation and no recurrence has been observed during the 24 months after surgery.

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