Peripheral Acanthomatous Ameloblasoma in a Rabbit with Review of Previous Submissions of the Armed Forces Institute of Pathology Wednesday Slide Conference

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ABSTRACT. A case of peripheral acanthomatous ameloblasoma of the angulus orisa in a 6-year-old female rabbit was described. The tumor composed of confluent follicles of stellate reticulum with peripheral cuboidal to reverse polarized columnar cells with nuclear palisading in the submucosa of the angulus orisa. The follicular cell elements stained positive for pan-cytokeratin. Additionally, there were multifocal keratinizing foci of the stellate reticulum with some mineralization. Calcified product such as enamel or dentin was not formed. Acanthomatous ameloblasoma in the submucosa of the angulus orisa has not been described and it may develop from an ectopic rest of odontogenic tissue. After excision, neither local recurrence nor metastasis has been observed.

KEY WORDS: acanthomatous ameloblasoma, angulus orisa, lip, rabbit, submucosa.

Odontogenic tumors, including epithelial odontogenic tumors are rare in animals [5, 8–10, 12]. Only two reference cases of ameloblasoma in rabbits have been submitted to the Armed Forces Institute of Pathology Wednesday Slide Conference, Case I-388 (AFIP 2578783) and Case II-97N172 (AFIP 2638859). We reported herein an additional case and review the pathological features of other two cases.

A 6-year-old female rabbit was presented to a referring veterinarian because of hematuria. There was little improvement with medication, and ovariohysterectomy was subsequently performed as the treatment of choice. Under anesthesia, a dental examination was also carried out and an approximately 1 cm spherical mass of the right angulus orisa (Fig. 1) was found incidentally, excised, and submitted for histopathology.

Histologically, the mass was covered with keratinized stratified squamous epithelium. It was nonencapsulated and composed of variously sized, irregularly shaped and anastomosing epithelial nests (follicles) embedded in the coarse bands of connective tissue stroma. The confluent follicles consisted of a central reticular formation of sparse polygonal, spindle or stellate cells surrounded by a peripheral row of cuboidal to tall reverse polarized columnar cells with nuclear palisading, thus resembling the enamel organ (Fig. 2). The foci of the concentric cornified stratified squamous epithelium (keratinizing squamous metaplasia) were found in some follicles (Fig. 2). Calcification of the keratinized cells was also sometimes observed (Fig. 2). Immunohistochemically, the epithelial nests stained positive for pan-cytokeratin (mouse monoclonal anti-human keratin/cytokeratin (AE1, AE3) antibody, prediluted; Nichirei, Tokyo, Japan) (Fig. 3). Calcified product such as enamel or dentin was not formed. The growth pattern of the mass was predominantly expansile, and the proliferated cells extended to the submitted surgical margin. Although the surgical excision may not be complete, the proliferated cells extended to the submitted surgical margin. Although the surgical excision may not be complete, local recurrence or metastasis has not been observed.

The classification as an odontogenic tumor depends on recognition of dental tissue differentiation in the odontogenic epithelium, dentinal tissue, cemental tissue, or periodontal ligament tissue. In domestic animals, there are three
tumors which are classified as tumors of the odontogenic epithelium without odontogenic mesenchyme: ameloblastoma, defined by a rare tumor of the jaw derived from the odontogenic epithelium, amyloid-producing odontogenic tumor, defined by the presence of odontogenic epithelium as seen in ameloblastoma associated with the extracellular depositsions of Congo-red-positive material, and canine acanthomatous ameloblastoma (acanthomatous epulis) which exists only in the canine species [7].

Four major morphological characteristics are recognized for the odontogenic epithelium: 1) palisading of epithelial cells at the periphery, 2) the palisaded epithelial cells have a nucleus at the apical pole, 3) the palisaded epithelial cells have cytoplasmic clearing at the basilar pole, 4) internal epithelial cells are connected by the long intercellular bridges reminiscent of stellate reticulum [7]. Our present case is consistent with all the above mentioned criteria with no enamel or dentin observed, and may therefore be classified as ameloblastoma of odontogenic epithelium origin.

According to human histological subclassification, there are a variety of subtypes in ameloblastomas, identified according to histological appearances. The main subtypes are follicular, plexiform, acanthomatous, basal cell, and granular cell types [6, 10]. Follicular ameloblastomas typically consist of epithelial islands with a peripheral palisaded cell layer surrounding a central stellate reticulum area, whereas the tumor epithelium in the plexiform type is arranged in irregular masses or anastomosing cords. Ameloblastomas with the general pattern of the follicular type, but with additional squamous metaplasia and keratinization within the stellate reticulum areas, are designated acanthomatous [4]. Our present case can therefore be subclassified as acanthomatous ameloblastoma since multifocal keratinizing squamous metaplasia was a characteristic histological feature.

Ameloblastomas are rare in rabbits. Only two reference cases of ameloblastoma in rabbit have been submitted to the AFIP Wednesday Slide Conference, Case I-388 (AFIP 2578783) and Case II-97N172 (AFIP 2638859), with no reported cases. The clinical and pathological features of the previously submitted cases including that of the present case are summarized in Table 1. Three ameloblastomas occurred in adult rabbits over the age of five years as a single mass.

In man, about 80% of the ameloblastomas arise as an intra-osseous growth in the mandible [1], whereas the peripheral or soft tissue counterpart of central or intraosseous ameloblastoma is rare [11]. In animals, ameloblastomas located in the mandibular arcade occur nearly three times more often than in the maxillary arcade [12], whereas in dogs the frequency is about the same for both mandible and maxilla [3]. While the frequency of the peripheral or soft tissue ameloblastomas in animals has not been described, the location of the tumor of the angulus oris is unusual and makes its developmental origin difficult to explain.

In lagomorphs, the rarity of dental anomalies has been confirmed, but there were some descriptions of additional teeth including upper cheek teeth in a domestic, loop-eared rabbit [2]. Our present case may also, represent an ectopic rest of odontogenic tissue, similar to the tumor that occurred in the buccal mucosa in a rabbit (Table 1, refer to Case II-
In conclusion, we diagnosed this tumor as peripheral acanthomatous ameloblastoma of the angulus orisa. Odontogenic tumors should be taken into consideration for differential diagnosis of rabial submucosal tumors in rabbits and further information is required for the pathogenesis and prognosis of these tumors. This appears to be the first reported case of peripheral acanthomatous ameloblastoma of the angulus orisa in rabbits.

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REFERENCES


Table 1. Ameloblastoma in rabbits.

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Breed</th>
<th>Gender</th>
<th>Age (year)</th>
<th>Tumor Size</th>
<th>Localization</th>
<th>Prognosis</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lop-eared rabbit</td>
<td>Castrated Male</td>
<td>5</td>
<td>2×2×3 cm</td>
<td>Maxillary gingiva, maxilla and nasal cavity</td>
<td>Euthanasia</td>
<td>AFIP 2578783</td>
</tr>
<tr>
<td>2</td>
<td>New Zealand white rabbit</td>
<td>Male</td>
<td>6</td>
<td>18×10×10 mm</td>
<td>Buccal mucosa</td>
<td>Tumor exised</td>
<td>AFIP 2638859</td>
</tr>
<tr>
<td>3</td>
<td>Unknown</td>
<td>Female</td>
<td>6</td>
<td>1×1×1 cm</td>
<td>Lip</td>
<td>Tumor exised</td>
<td>Good prognosis</td>
</tr>
</tbody>
</table>