Oral mass in a Wheaten Terrier

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Anatomic Pathology Resident
University of Georgia College of Veterinary Medicine
Signalment, History & Gross Findings

- 11 year old neutered male Wheaten Terrier
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- Presented for removal of an oral mass located at the mandibular symphysis
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- The mass was 3.2 x 3.0 x 2.5 cm, firm, tan, bulbous, and immobile
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- 11 year old neutered male Wheaten Terrier
- Presented for removal of an oral mass located at the mandibular symphysis
- The mass was 3.2 x 3.0 x 2.5 cm, firm, tan, bulbous, and immobile
- On cut surface, it had mineralized and cystic areas
Histopathologic Findings
Morphologic Diagnoses

Mandible: Amyloid-producing odontogenic tumor
Confirmatory testing
Odontogenic tumors
Odontogenic tumors

- Presentation: Solitary masses associated with the dental arcade
- Behavior: Benign or locally invasive, but not metastatic
- Arise from components of the developing tooth
  - Odontogenic epithelium
  - Odontogenic ectomesenchyme
    - Odontogenic extracellular matrix ("Dental hard tissue")
    - Periodontal ligament
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Odontogenic tumors

- Odontogenic epithelium
  - Basilar (arrows)
    - Cuboidal to columnar
    - Palisade along the basement membrane
    - Apical nuclei
    - Basilar cytoplasmic clearing or vacuolization
  - Non-basilar (arrowheads)
    - Long intercellular bridges
    - Variable cell morphology
    - Cytoplasmic vacuolization

Credit: Tumors in Domestic Animals, Meuten 2017
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Odontogenic tumors

- Odontogenic extracellular matrix
  - Dentin (produced by odontoblasts)
    - Resembles bone, but is acellular
    - Well-organized: tubular with imbrication lines
    - Poorly organized: irregular and not well mineralized
  - Cementum (produced by cementoblasts)
    - May have cementocytes, cementoblasts, and cementoclasts
    - Basophilic reversal lines
  - Enamel (produced by ameloblasts)
    - Mature enamel dissolves during decalcification
    - May see immature crystals or rods
    - Successive deposition leaves incremental lines

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Credit: Wheater’s Functional Histology, 2006
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Credit: Dr. Md. Nurul Islam
Odontogenic tumors

- Periodontal ligament
  - Fine fibrillar collagen
  - Regularly spaced stellate cells
  - Regularly spaced, angular or dilated, empty blood vessels
Odontogenic tumors

- Odontogenic epithelium without odontogenic ectomesenchyme
  - Acanthomatous ameloblastoma, etc.

- Odontogenic epithelium with odontogenic ectomesenchyme
  - Ameloblastic fibro-odontoma, complex odontoma, etc.

- Odontogenic ectomesenchyme with or without odontogenic epithelium
  - Peripheral odontogenic fibroma (previously termed fibromatous epulis), etc.

- Cysts of the jaw
  - Dentigerous cysts, etc.
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Amyloid-producing odontogenic tumor

- Rare tumor reported in dogs, cats, and a single goat
- Arise from odontogenic epithelium
- May include areas of keratinization and dental hard tissue (cementum or dentin)
- **Characterized by variably mineralized, Congo red-positive amyloid deposits**
  - Mineralized amyloid can form laminated concretions called Liesegang rings
  - Different from the amyloid formed in other circumstances (e.g. AA, AL)
  - Derived from enamel proteins secreted from ameloblasts
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Amyloid-producing odontogenic tumor

Probably arises from ameloblasts!
Acknowledgements

- Martha Frances Dalton
- Kaori Sakamoto
- Elizabeth Uhl
- Our awesome histo techs
- Buffy Howerth and James Stanton
- My amazing resident-mates
References


<table>
<thead>
<tr>
<th>Tumors described in current text</th>
<th>Other previously used terms</th>
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<tr>
<td>Odontogenic epulis without odontogenic ectomesenchyme</td>
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<tr>
<td>Ameloblastoma</td>
<td>Adenomatousameloblastoma</td>
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<td>Canine acanthomatous ameloblastoma</td>
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<td>Perineural ameloblastoma</td>
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<td>Basal carcinoma</td>
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<td>Ameloblastic carcinoma</td>
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<td>Ameloblastic fibroma</td>
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<td>Odontogenic fibro-epulis, ameloblastic fibroductinoma</td>
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<td>Complex odontoma</td>
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<td>Compound odontoma</td>
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<td>Cemantoma, cemenoblastoma</td>
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*Approximately one-third to half of all odontogenic tumors in dogs are peripheral odontogenic fibroma or canine acanthomatous ameloblastoma (formally referred to as epulis).