Management of Oral Pathologic Lesions

Surgical Management of Benign Tumors

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Goals of Treatment

- Complete eradication of a lesion.
- Preservation of the normal tissue as permissible.
- Excision with least morbidity.
- Restoration of tissue loss, form and function.
- Long term follow up for recurrence.
Selection of Treatment

- Aggressiveness of Lesion.
  - Histologic diagnosis.

- Anatomic Location of Lesion
  - Site of tumor.
  - Maxilla versus mandible.
  - Proximity to adjacent vital structures.
  - Intraosseous versus extraosseous location.

- Duration of Lesion.
- Reconstructive Efforts.
Enucleation and/or curettage:

- Local removal of tumor by instrumentation in direct contact with the lesion.

Indications:

- Very small benign lesions.
- Low rate of recurrence.

Technique:

- As described for cysts.
Resection:

- Removal of a tumor by incising through uninvolved tissues around the tumor
- Indications:
  - Aggressive lesions.
Treatment Modalities

- Resection.

  - Types:
    - Marginal.
    - Partial.
    - Total.
    - Composite.
Marginal (segmental) resection.

Resection of a tumor without disruption of the continuity of the bone.
Marginal (segmental) resection.

Technique.
Marginal (segmental) resection.

Technique.
Marginal (segmental) resection.

Technique.
Treatment Modalities

- Marginal (segmental) resection.
- Technique.
Marginal (segmental) resection.

**Technique.**

- Full-thickness mucoperiosteal flap.
- Surgical saws or burs are then used to section the bone in the planned locations.
- The segment is removed.
- Grafting the resected area.
- Flap closure.
Partial resection.

Resection of a tumor by removing a full-thickness portion of the jaw.
Partial resection.

✓ Technique.
Partial resection.

Technique.
Treatment Modalities

- Partial resection.
- Technique.
Partial resection.

Technique.
Treatment Modalities

- Partial resection.
- Technique.
Total resection.

Resection of a tumor by removal of the involved bone.

- Maxillectomy.
- Mandibulectomy.
Total resection.
Total resection.
Total resection.

Technique.
Composite resection.

- Resection of a tumor with bone, adjacent soft tissues, and contiguous lymph nodes.

Indications:
- Malignancy.
Classification

- Odontogenic Tumors.
- Non odontogenic Tumors.
  - Fibroosseous lesions.
  - Lesions Containing Giant Cells.
  - Vascular Malformations.
  - Neurogenic Tumors.
Tumors of odontogenic epithelium.

- Odontogenic Keratocyst
- Ameloblastoma
- Calcifying epithelial odontogenic tumor
- Squamous odontogenic tumor
Odontogenic Benign Tumors

Tumors of odontogenic epithelium with odontogenic ectomesenchyme.

- Ameloblastic fibroma
- Ameloblastic fibro-odontoma
- Odontoma
- Adenomatoid odontogenic tumor
Odontogenic Benign Tumors

Tumors of odontogenic ectomesenchyme.

- Odontogenic fibroma
- Granular cell odontogenic tumor
- Odontogenic myxoma
- Cementoblastoma
Odontogenic Benign Tumors

- Odontogenic Keratocyst (OKC).
  - Derived from dental lamina.
  - Two Variants:
    - Sporadic cyst.
    - Associated with nevoid basal cell carcinoma syndrome.
Odontogenic Benign Tumors

- Odontogenic Keratocyst (OKC).
- Keratocystic Odontogenic Tumor (KCOT).
- Derived from dental lamina.
- Their growth may be related to unknown factors inherent in the epithelium itself or enzymatic activity in the fibrous wall.
- Two Variants:
  - Sporadic cyst.
  - Associated with nevoid basal cell carcinoma syndrome.
Keratocystic Odontogenic Tumor (KCOT).

- 60% of cases are seen in people between 10 and 40 years old.
- 60 to 80% of cases involve the mandible, particularly in the posterior body and ascending ramus.
Odontogenic Benign Tumors

- Keratocystic Odontogenic Tumor (KCOT).
- Radiographic Picture.
Odontogenic Benign Tumors

- Keratocystic Odontogenic Tumor (KCOT).
- Histology.
Odontogenic Benign Tumors

> Keratocystic Odontogenic Tumor (KCOT).

✓ Histology.
Odontogenic Benign Tumors

Chart: Keratocystic Odontogenic Tumor (KCOT).

- Treatment.
  - Enucleation & curettage (Carnoy’s solution).
  - Resection with 5 mm linear margins.
  - Marsuplization Followed by resection.
Keratocystic Odontogenic Tumor (KCOT).

Recurrence.

- 2-62% / 30%.
- Due to:
  - Incomplete removal of the original cyst secondary to a thin friable lining and cortical perforation with adherence to adjacent soft tissue.
  - Remaining satellite cysts.
  - Remnants of dental lamina within the jaw (de novo cyst formation).
Odontogenic Benign Tumors

نكادوفيكسيك أودنتوجينيك تومور (KCOT).

✔ Nevoid Basal Cell Carcinoma Syndrome.

• Autosomal-dominant inherited condition.
• Clinically:
  • Multiple KCOT.
  • Multiple basal cell carcinomas.
  • Frontal and temporoparietal bossing.
  • Hypertelorism.
  • Mandibular prognathism.
  • Pitting defects on the palms and soles.
Odontogenic Benign Tumors

- Keratocystic Odontogenic Tumor (KCOT).
- Nevoid Basal Cell Carcinoma Syndrome.
Odontogenic Benign Tumors

Keratocystic Odontogenic Tumor (KCOT).

Nevoid Basal Cell Carcinoma Syndrome.

- Radiograph:
  - Bifid ribs.
  - Lamellar calcification of falx cerebri.
Keratocystic Odontogenic Tumor (KCOT).

Neviod Basal Cell Carcinoma Syndrome.
Keratocystic Odontogenic Tumor (KCOT).

Neviod Basal Cell Carcinoma Syndrome.

- **Tx:**
  - Resection.
  - Marsuplization.
Ameloblastoma.

Most common after odontoma.

Arises from:

- Rests of the dental lamina.
- Developing enamel organ.
- Epithelial lining of an odontogenic cyst.
- Basal cells of the oral mucosa.
Ameloblastoma.

3 Variants:
- Solid or multicystic.
- Unicystic.
- Peripheral.
Odontogenic Benign Tumors

Ameloblastoma.

- Solid or multicystic.
  - Third to seventh decades.
  - Mandible (85%) / Molar-ramus region.
  - Slow growing painless expansion of the jaw.
  - Uncommon neurosensory changes.
Ameloblastoma.

- Solid or multicystic.
  - Histology.
Ameloblastoma.

- Solid or multicystic.
  - Histology.
Odontogenic Benign Tumors

Ameloblastoma.

- Solid or multicystic.
  - Treatment.
  - Resection with 1.0 cm linear bony margins.
Odontogenic Benign Tumors

- Ameloblastoma.
  - Unicystic.
    - Clinically.
      - Young patients.
      - Mandible (molar/ramus region).
Ameloblastoma.

Unicystic.

- Radiograph.
Odontogenic Benign Tumors

Ameloblastoma.

Unicystic.

- Histology.
  - Luminal.
  - Interluminal.
  - Mural.
Ameloblastoma.

Peripheral.

- Clinical.
  - < 1.5 cm.
  - Old age.
  - No bone infiltration.
Ameloblastoma.

Peripheral.

- Radiograph.
- Cupping out.
Odontogenic Benign Tumors

Ameloblastoma.

Peripheral.

- Treatment.
  - Wide local excision.
Calcifying Epithelial Odontogenic Tumor. (Pindborg tumor)

- 30 and 50 years of age.
- Mandible.
Calcifying Epithelial Odontogenic Tumor. (Pindborg tumor)

Radiograph.
Odontogenic Benign Tumors

Calcreting Epithelial Odontogenic Tumor. (Pindborg tumor)

Histology.
Calcifying Epithelial Odontogenic Tumor. (Pindborg tumor)

Treatment.

- Resection with 1.0 cm bony linear margins.
- Appropriate attention to soft tissue anatomic barriers.
Ameloblastic Fibroma.

Clinical.

- First two decades.
- The posterior mandible.
Odontogenic Benign Tumors

Ameloblastic Fibroma.

- Radiograph.
  - Unilocular.
  - Multilocular.
Odontogenic Benign Tumors

- Ameloblastic Fibroma.

- Radiograph.

  - Enucleation and curettage.
  - Resection for recurrent lesion.
Odontogenic Benign Tumors

Odontoma.

Types.

- Compound.
  - Anterior maxilla.

- Complex.
  - Posterior maxilla or mandible.
Odontogenic Benign Tumors

- Odontoma.

Types.

 validated Compound.
Odontogenic Benign Tumors

- Odontoma.
- Radiograph.
Odontogenic Benign Tumors

✦ Odontoma.

☐ Treatment.

✓ May be left.

✓ Enucleation and curettage. (reasons for Tx)
Odontogenic Benign Tumors

- Ameloblastic Fibro-odontoma.
- Immature complex odontoma.
- Radiograph.
Odontogenic Benign Tumors

Ameloblastic Fibro-odontoma.

✔ Treatment.
  - Enucleation and curettage.
Odontogenic Benign Tumors

Adenomatoid Odontogenic Tumor.

- Believed to be a variant of ameloblastoma.
- Young patients (2nd decade)
- Maxilla > Mandible.
- Females > Males.
- Small, rarely exceeding 3 cm in diameter.
Adenomatoid Odontogenic Tumor.

- Well-circumscribed unilocular radiolucency that involves the crown of unerupted tooth, frequently a canine.
Odontogenic Benign Tumors

- Adenomatoid Odontogenic Tumor.
- Histology.
Adenomatoid Odontogenic Tumor.

- Treatment.
  - Enucleation and curettage.
Odontogenic Benign Tumors

- Odontogenic Myxoma.
  - Slow growing with aggressive behavior.
  - High recurrence rate.
  - Third decade of life.
  - Posterior mandible.
Odontogenic Benign Tumors

- Odontogenic Myxoma.
  - Radiograph.
  - Multilocular.
  - Unilocalular.
Odontogenic Benign Tumors

Odontogenic Myxoma.

- Histology.
  - Resembles the dental papilla of the developing tooth.
Odontogenic Benign Tumors

- Benign Cementoblastoma.
- True Cementoma

- Characterized by the formation of sheets of cementum-like tissue containing a large number of reversal lines and being unmineralized at the periphery of the mass or in the more active growth areas.
Benign Cementoblastoma.

- Clinical.
  - 10 to 20 years.
  - No sex predilection.
  - Almost equal frequency in mandible and the maxilla.
  - Premolar or molar region.
  - Mandibular lesions attached to single tooth.
  - Maxillary lesions are fused to two or more teeth.
Odontogenic Benign Tumors

Benign Cementoblastoma.

- Clinical.
  - Slow growing lesion with clinical expansion of the jaw, producing facial asymmetry.
  - Vital tooth.
Odontogenic Benign Tumors

Benign Cementoblastoma.

Radiograph.
- well defined, round, oval radiopaque mass with a radiolucent periphery.
- Fused to the roots.
Odontogenic Benign Tumors

Benign Cementoblastoma.

Treatment.

- Enucleation and curettage.
- Extraction to the teeth.
Benign Fibro-osseous Diseases.

The replacement of normal bone with a tissue composed of collagen fibers and fibroblasts that contain varying amounts of mineralized substance, which can be either bone or cementum-like material.
Benign Fibro-osseous Diseases.

- Classification.
  - Fibrous dysplasia.
  - Cemento-osseous dysplasia.
  - Fibro-osseous neoplasms.
Nonodontogenic Benign Tumors

- Fibrous dysplasia.
  - Developmental hamartomatous of unknown etiology.
  - Developmental arrest in a benign fibro-osseous proliferation that lacks the ability to fully differentiate.
Fibrous dysplasia.

Forms:
- Monostotic.
- Polyostotic.
- Albright’s syndrome.
- Craniofacial.
Fibrous dysplasia.

Clinical:
- 1\textsuperscript{st} and 2\textsuperscript{nd} decades.
- Painless swelling of the involved bones.
- Maxilla > Mandible.
- Female > Males.
Fibrous dysplasia.

Clinical:
- Periods of activity and periods of quiescence.
- Teeth can be displaced by the lesion.
- Premalignant lesion.
Nonodontogenic Benign Tumors

Fibrous dysplasia.

Radiograph:
- Ground glass appearance.
Fibrous dysplasia.

- Treatment:
  - Symptomatic.
  - Cosmetic recontouring
Nonodontogenic Benign Tumors

- **Cemento-osseous Dysplasia.**

  - Pathologic process of the tooth-bearing area.
  - The commonest of fibro-osseous disease.
  - Disordered production of bone and cementum-like tissue in the jaws.
Cemento-osseous Dysplasia.

- Unknown etiology, but local trauma may play some part.
- The periodontal ligament may be the origin.
Nonodontogenic Benign Tumors

Cemento-osseous Dysplasia.

- Histology.
  - New woven bone trabeculae.
  - Spherules of cementum-like material.
  - Fibrous tissue.
  - Little inflammatory cells.
Cemento-osseous Dysplasia.

Forms:
- Periapical COD.
- Focal COD.
- Florid COD.
- Familial gigantiform cementoma.
Cemento-osseous Dysplasia.

- Periapical COD.

- Circumscribed lesions in periapical areas.

- Vital teeth.

- Anterior mandible.

- African American females.
Nonodontogenic Benign Tumors

- Cemento-osseous Dysplasia.
- Periapical COD.
- Radiograph.
Cemento-osseous Dysplasia.

- Focal COD.
- Edentulous areas of the mandible.
- More localized than PCOD.
- Anterior or posterior mandible.
Nonodontogenic Benign Tumors

👉 Cemento-osseous Dysplasia.
👉 Focal COD.
✓ Radiograph.
Nonodontogenic Benign Tumors

- Cemento-osseous Dysplasia.
- Florid COD.

- All racial groups.
- Two or more jaw quadrants.
- May be superimposed infection and osteomyelitis.
Nonodontogenic Benign Tumors

- Cemento-osseous Dysplasia.
- Florid COD.
- Radiograph.
Nonodontogenic Benign Tumors

- Cemento-osseous Dysplasia.
  - Familial Gigantiform Cementoma.
    - Autosomal dominant variant.
    - No racial predilection.
    - Multiple quadrants.
    - Variably expansile.
  - Evolves during childhood and can grow rapidly.
Nonodontogenic Benign Tumors

- Cemento-osseous Dysplasia.
- Familial Gigantiform Cementoma.
Nonodontogenic Benign Tumors

- Cemento-osseous Dysplasia.
- Familial Gigantiform Cementoma.
- Radiograph.
Nonodontogenic Benign Tumors

Cemento-osseous Dysplasia.
- Familial Gigantiform Cementoma.

Treatment.
- Symptomatic.
- Surgical recontouring.
Nonodontogenic Benign Tumors

- Fibro-osseous Neoplasms.
  - Ossifying Fibroma.

- Third and fourth decades.
- Female predominance.
- No racial predominance.
Nonodontogenic Benign Tumors

- Fibro-osseous Neoplasms.
  - Ossifying Fibroma.
Nonodontogenic Benign Tumors

Fibro-osseous Neoplasms.

Ossifying Fibroma.

Treatment.

- Enucleation with curettage.
- Aggressive treatment for more aggressive lesions.
  - Aggressive curettage.
  - Localized surgical resection.
  - Segmental resection.
Nonodontogenic Benign Tumors

- Fibro-osseous Neoplasms.
  - Juvenile Aggressive Ossifying Fibroma.

- Younger children and adolescents.
- Aggressive behavior.
- Recurrence rates of between 20 and 50%.
Nonodontogenic Benign Tumors

- Fibro-osseous Neoplasms.
- Juvenile Aggressive Ossifying Fibroma.
- Radiograph.
Nonodontogenic Benign Tumors

- Fibro-osseous Neoplasms.
  - Juvenile Aggressive Ossifying Fibroma.

- Treatment.
  - Conservative Excision.
Nonodontogenic Benign Tumors

Osteoma.

- Benign tumors consisting of mature compact or cancellous bone.
- 2\textsuperscript{nd} and 5\textsuperscript{th} decades.
- Males > Females.
- Types.
  - Periosteal.
  - Endosteal.
Nonodontogenic Benign Tumors

- Osteoma.
- Radiograph.
  - Periosteal.
Nonodontogenic Benign Tumors

- Osteoma.
- Radiograph.
  - Endosteal.
Nonodontogenic Benign Tumors

בועי Osteoma.

☑Treatment.

- Follow up.
- Surgical excision.
Nonodontogenic Benign Lesions

Gardner Syndrome.

Treatment.

- Multiple osteoma.
- Fibromas of the skin.
- Epidermal cysts.
- Impacted teeth.
- Odontomas.
- Intestinal polyposis.
Nonodontogenic Benign Lesions

Synovial Chondromatosis

- Occur in the TMJ.
- Proliferation of small particulates (unattached chondromas) within the confines of the joint capsule.
- Metaplasia of the synovial lining cells of the joint.
- Unknown etiology.
Nonodontogenic Benign Lesions

Synovial Chondromatosis

- Pain.
- Swelling
- Deviation of the mandible.
Nonodontogenic Benign Lesions

- Synovial Chondromatosis
- Radiograph.
Nonodontogenic Benign Lesions

- Synovial Chondromatosis
- Radiograph.
Nonodontogenic Benign Lesions

Synovial Chondromatosis

Treatment.

- Surgical removal with the synovial lining.
Osteochondroma.

- TMJ.
- Asymptomatic.
- Malocclusion.
Nonodontogenic Benign Tumors

- Osteochondroma.
- Radiograph.
Nonodontogenic Benign Tumors

⚠️ Osteochondroma.
✓ Radiograph.
Nonodontogenetic Benign Lesions

Key Points:

- Giant Cell Lesions.
  - Number of lesions that occur in the jaws that contain giant cells within them.
  - Histologically all of the giant cell lesions appear similar.
    - Giant cells.
    - Vascular stroma.
Nonodontogenic Benign Lesions

- Giant Cell Lesions.
  - Central Giant Cell Granuloma.
  - Giant Cell Tumor.
  - Hyperparathyroidism.
  - Cherubism.
  - Aneurysmal Bone Cyst.
Central Giant Cell Granuloma.

True Nature is unknown.

- Inflammatory.
- Reactive.
- Tumor.
- Endocrine.
Nonodontogenic Benign Lesions

- Central Giant Cell Granuloma.
  - 2\textsuperscript{nd} & 3\textsuperscript{rd} decades.
  - Anterior parts of the jaws.
  - Immunohistochemistry.
Nonodontogenic Benign Lesions

- Central Giant Cell Granuloma.

✓ Radiograph
Central Giant Cell Granuloma.

Treatment.

- Local curettage.
- In aggressive variants, more aggressive surgery has been suggested.
- 15 to 20% recurrence rate.
Central Giant Cell Granuloma.

Treatment.

- Non surgical.
  - Intralional steroids.
  - SC Calcitonin.
  - SC α-Interferon.
Nonodontogenic Benign Lesions

- Giant Cell Tumor.
  - Extremely rare.
  - Aggressive.

- Treatment.
  - Local curettage.
  - Resection.
Hyperparathyroidism.

Calcium is mobilized from the bones into the bloodstream to maintain homeostasis in the face of increased renal excretion.

It should be considered in:

- Recurrent lesions.
- Aggressive lesions.
- Multiple lesions.
Hyperparathyroidism.

It should be ruled out by:

- Serum calcium.
- Serum phosphate.
- Serum parathormone and parathormone-related protein assays.
- Alkaline phosphatase.
Nonodontogenic Benign Lesions

Cherubism.

✓ Familial genetically dominant condition.

✓ Affected family members have multiple lesions mainly affecting the facial bones.

✓ The face has a rounded appearance and the eyes tend to look upward.

✓ Expression is variable.
Nonodontogenic Benign Lesions

- Cherubism
Nonodontogenic Benign Lesions

様々 Cherubism.
✓ Radiograph.
Cherubism.

Treatment.

- Conservative.
- Teenage years.
  - Trying to aid eruption of the teeth.
  - At the end 2nd & in the 3rd decades.
  - Cosmetic recontouring.
Aneurysmal Bone Cyst.

- Combination of a sinusoidal vascular lesion with a giant cell component.

- Some authorities consider this to be a vascular variant of a central giant cell granuloma.
Nonodontogenic Benign Lesions

👋 Aneurysmal Bone Cyst.
✓ Radiograph.
Nonodontogenic Benign Lesions

❖ Aneurysmal Bone Cyst.

✓ Treatment.
  • Aggressive curettage.
Nonodontogenic Benign Lesions

- Vascular lesions.
  - Occur anywhere in the body.
  - Developmental.
  - Central & peripheral.
  - Contrast to the true hemangioma, which is a neoplasm.

- Classification.
  - High-flow.
  - Low-flow.
Nonodontogenic Benign Lesions

🔍 Vascular lesions.

✓ Many of them are asymptomatic.
✓ Slow-growing asymmetric expansile lesion.
✓ May be associated with a bruit.
Nonodontogenic Benign Lesions

- Vascular lesions.
  - Radiograph.
    - High-flow.
Nonodontogenic Benign Lesions

- Vascular lesions.
  - Radiograph.
    - Low-flow.
Nonodontogenic Benign Lesions

- Vascular lesions.
- Diagnostic tools.
  - Aspiration.
  - CT.
  - Angiography.
Nonodontogenic Benign Lesions

❖ Vascular lesions.
✓ Treatment.
  ▪ High flow
    ○ Preoperative embolization followed by wide resective surgery.
Nonodontogenic Benign Lesions

- Vascular lesions.
  - Treatment.
    - High flow
Nonodontogenic Benign Lesions

 вли. Vascular lesions.

Treatment.

- Low flow
- Intrallesional injection of a variety of agents.
  - Sclerosing agents.
  - Absorbable gelatin sponge.
  - Platinum coils.
- Followed by Local curettage.
Neurogenic Tumors.

1. Schwannoma.

- Benign tumor of the neurolema or nerve sheath.
- Found in the soft tissues but it can occur in bone.
- Well-defined radiolucency.
- Treatment by surgical excision.
Neurogenic Tumors.

1. Neurofibroma.
   - Derived from the fibrous elements of the neural sheath.
   - Solitary lesions or as part of generalized neurofibromatosis.
   - Soft tissues and bone.
   - Treated by localized excision.
   - 5 – 15% malignant transformation.
Neurogenic Tumors.

- Misguided attempt at nerve regeneration following an injury to a nerve.
- If a nerve is injured along its length, either an incontinuity or lateral neuroma can result.
- Treated by resection of the neuroma and appropriate nerve reconstruction.
Nonodontogenic Benign Lesions

- Neurogenic Tumors.
- Traumatic Neuroma.
Paget’s Disease.  
Osteitis deformans.

Slowly progressive bone condition of unknown etiology, predominantly affecting males over the age of 50 years.

Most bones of the body are involved, and can result in considerable deformity.

In the facial region the maxilla is affected more often than the mandible.
Nonodontogenic Benign Lesions

Paget’s Disease.
Osteitis deformans.

- Family history.
- The classic presentation used to be a patient whose hat or gloves no longer fitted correctly or in whom the maxillary denture, did not fit owing to bone swelling.
- Patient suffering from pain and deformity.
- Headache when involve head.
- Elevated serum alkaline phosphatase.
Paget’s Disease.
Osteitis deformans.

The radiographic appearance.

- Cotton-wool appearance in the skull and maxilla of affected patients.
- Hypercementosis around the roots of teeth.
- Loss of lamina dura.
- Obliteration of the periodontal ligament space.
Nonodontogenic Benign Lesions

- Paget’s Disease.
- Osteitis deformans.
- The radiographic appearance.
Nonodontogenic Benign Lesions

Paget’s Disease.
Osteitis deformans.

Treatment.

- Systemic.
  - Calcitonin.
- Diphosphonates.
- Local.
  - Cosmetic and/or functional recontouring.
Nonodontogenic Benign Lesions

- Paget’s Disease.
  Osteitis deformans.
- Patient may die early in life.