Facts

- **Growths** are usually considered benign
- **Tumors** are usually considered **malignant**
- **Malignant** tumors **metastasize** to other parts of the body
- **Hyperplastic** tissue is excessive normal growth
- **Neoplasms** are excessive abnormal growth
- **Neoplasia** new growth
- **Cystic** closed sac

Oncogene

- Mutated genes that control cell growth
- The study of cancer is "oncology"
- Physician treating cancer is an "oncologist"

Cancer Cell Description

- Pleomorphic (many sizes)
- Hyperchromatic (dark nuclei)
- Abnormal nuclei to cytoplasm ratio
- Abnormal mitosis

Diffuse vs. Well circumscribed

Well circumscribed tumors are encapsulated, usually benign

More Facts

- -oma means growth
- By itself it usually means benign ie.
- “sarcoma” means malignant connective tissue
- “Carcinoma” means malignant epithelium
**papilloma**
- Benign lesion of epithelial origin
- Usually pedunculated
- Treatment is excision

**leukoplakia**
- Areas of hyperkeratinization
- Caused by trauma, irritation
- Cells are “dysplastic” or abnormal
- Can become “metaplastic” or precancerous but reversible
- Cells can become “anaplastic” or cancerous

**Erythroplakia**
- A form of epithelial dysplasia
- May be speckled (red and white)
- Rarer than leukoplakia but more serious, more often squamous cell carcinoma

**Epithelial Dysplasia**
- Disordered and premalignant growth
- Frequently precedes squamous cell carcinoma
- May revert back to normal if stimulus (tobacco smoking) is removed
- May present as Erythematous lesion or leukoplakia
- Differs from squamous cell carcinoma b/c no invasion of abnormal epith cells through basement membrane

**Solar (actinic) Cheilitis**
- Dysplastic epithelium caused by excessive sun exposure
- May become carcinoma if exposure continues

**Carcinoma in situ**
- A carcinoma that has not penetrated the basement membrane
- Verrucous carcinoma is an example
Verrucous Carcinoma

- A form of squamous cell carcinoma
- Locally destructive but usually does not metastasize
- Prognosis good

Squamous cell carcinoma

- 90% of all oral cavity cancers
- 5 year survival rate varies by location
- Can be ulcerative, exophytic
- Occurs intraorally on floor of mouth, borders of tongue, soft palate
- Extraorally on lower lip

Squamous cell carcinoma

- Abnormal keratin forms within lesion called “keratin pearls”
- TNM staging determines severity
  - 4 stages, each with TNM
  - T=tumor size, N = node involvement, M = metastasis degree

Toluidine blue diagnostic aid

Brush Biopsy

- Required data includes:
  - Diagnosis
  - Appearance
  - Color
  - Ulcerated
  - Symptoms
  - Location
  - Duration of lesion
  - Size of lesion
  - Risk Factors (alcohol &/or tobacco)
Instructions for Brush Biopsy

- Tear open 1 fixative package
- Remove bar coded slide from holder
- Moisten brush with patient’s saliva
- Press brush firmly against surface of lesion until pink tissue or pinpoint bleeding is observed. (Should see bend in shaft of brush before beginning rotational movement)
  - Usually 5-15 rotations
  - For white, thick lesions, 15-20 rotations
  - For ulcerated lesions, few rotations

Brush biopsy instructions continued

- Immediately following acquisition of sample, spread brush onto bar-code side of glass slide. Use rotating motion to spread lengthwise. Attempt to transfer all of acquired sample.
- Fold fixative packet and squeeze rest of contents on slide. May use other packet if insufficient amount.
- Complete test requisition form
- Allow slide to dry 15 minutes and place in slide holder
- Package biopsy in prepaid mailer and ship

Biopsy Options

- Fine needle biopsy (aspiration)
- Cone needle biopsy
- Incisional
- Excisional

Biopsy

- Excisional biopsy if lesion is small
- Incisional biopsy if lesion is large
- Microscopic diagnostic necessary
Squamous cell carcinoma

- Treatment includes excision, radiation, chemotherapy

Radiation - osteoradionecrosis

- Radiation destroys small blood vessels, necrosing bone, requires excision

Radiation - Radiation Caries

- Radiation destroys pulps of teeth causing abscesses
- Salivary gland function decreases
- Often teeth removed before radiation or root canals performed

Radiation - Radiation Caries

- Necrotic mucosa due to radiation
- Tender, bleeding, plaque buildup, can’t touch
- Recommend chlorhexidine, saline rinses but no alcohol mouthwash

Radiation – other side effects

- Radiated patients often suffer from hypothyroidism
- Candida infections common – Nystatin drug of choice
- Oral hygiene stressed before radiation treatment
- Dysgeusia due to little saliva
- Trismus is common

Radiation - Hyperbaric Oxygen (HBO) Therapy

- Post radiation therapy
- Oxygen under pressure forces oxygen into tissues injured by radiation
- Promotes healing, aids in antibiotic treatment of necrotic bone

Radiation - Mucositis

- After radiation mucositis (tissue inflammation) such as candida are common but can be treated with nystatin
Chemotherapy

• Antineoplastic drugs interfere with mitotic activity of cancer cells
• Effect all cells with rapid mitosis including skin (mucositis), hair (alopecia), bone marrow (myelosuppression, pancytopenia), GI track (nausea, diarrhea, etc)
• Cause hepatotoxicity, cardiotoxicity

Chemotherapy drugs (chemocare.com)

• Alkylating agents (cytoxan, etc) bind with DNA, inhibit growth
• Plant alkaloids (Oncovin) inhibit mitosis
• Antimetabolites (Methotrexate) block metabolites needed for cell division
• Antitumor antibiotics
• Topoisomerase inhibitors
• Miscellaneous Antineoplastics

Chemotherapy – oral side effects

• Transient xerostomia occurs
• Painful oral lesions
• Gingival bleeding
• Petechiae, ecchymosis occurs
• Candidiasis infections
• Dysgeusia, dysphagia

Chemotherapy – treatment considerations

• Schedule treatment when convenient
• Antibiotic premed may be necessary
• Saliva substitutes for xerostomia
• Topical analgesics for oral lesions
• TLC

Surgery - resection

• Tumor removed together with surrounding tissue
• started as “dipper’s pouch”

What dippers have in their future

Basal Cell Carcinoma

• Origin – basal cells of epithelium
• Usually found on face above the upper lip
• Characterized by rolled borders
• Usually excised, prognosis good
Salivary gland tumors

- Benign tumors called “adenoma”
- Malignant tumors end in carcinoma (adenocarcinoma, mucoepidermoid carcinoma)

Other salivary gland tumors

- Monomorphic adenoma has epithelial cells only
- Warthin’s tumor contains epithelium and lymph
- Adenoid cystic carcinoma, mucoepidermoid carcinoma are malignant forms

Pleomorphic adenoma

- Composed of connective tissue and epithelial cells
- Benign and encapsulated
- More common in middle aged women
- Project into underlying tissue so hard to remove
- May become malignant but rare

Kaposi Sarcoma

- A malignant vascular tumor caused by human herpesvirus
- Seen more frequently in HIV patients
- Requires surgery, radiation, chemotherapy
- Often reoccur

Melanin related tumors

- Arise from melanocytes
- Benign are nevi, malignant are melanoma
- Carefully evaluate dark lesions, check for “satellite bodies”
- Melanoma is aggressive, unpredictable
- Nevi can be black or “white sponge”

Tumors of Bone

- Tori (palatal, mandibular) is normal compact bony growth, hereditary in nature
- Exostosis is bony growth on buccal aspect of maxilla or mandible
Tumors of Bone

- Osteoma is benign growth of bone
- Well circumscribed
- Seen often with Gardner’s syndrome

Tumors of Bone

- Osteosarcoma is malignant growth seen more often in the mandible, may be radiolucent or - opaque
- Diffuse in appearance
- Contains compact and cancellous bone

Lipoma

- A growth of mature fat cells,
- Well defined, benign
- Treated by excision

Vascular Tumors

Hemangioma/lymphangioma

- Hemangioma is a collection of blood vessels often present at birth
- Capillary = small vessels, cavernous = large vessels
- Many undergo spontaneous remission, others require surgery
- Lymphangioma is benign collection of lymph vessels
- Lymphoma is malignant tumor of lymph tissue
- Benign tumors are excised but tend to recur

Other Tumors

- Rhabdomyosarcoma is tumor of striated muscle
- Leiomyosarcoma is tumor of smooth muscle
- Chondroma is benign cartilage tumor
- Chondrosarcoma is malignant
- Neuroma is benign tumor of nerve tissue
- Lymphoma is malignant tumor of lymph tissue

Nonneoplastic Diseases of Bone
### Periapical cemento-osseous dysplasia
- Predilection in middle aged black women
- Common in anterior mandible
- Bone becomes fibrous then reossifies
- Teeth are vital

### Fibrous Dysplasia
- Unknown cause
- Monostotic – single bone, usually maxilla or mandible
- Polyostotic – more than one bone, café au lait spots often present
- Painless enlargement
- Usually in children

### Fibrous dysplasia
- Bone is replaced with fibrous connective tissue
- Radiographically, bone has a “ground glass” appearance
- Treatment for monostotic is recontouring, no treatment for polyostotic

### Paget’s Disease
- Unknown etiology but may be slow developing virus coupled with heredity
- Usually 40 years or older
- Many times no symptoms – headache, glasses don’t fit, bigger hat size

### Paget’s Disease
- Increased osteoblastic and osteoclastic activity
- Bone develops a “cotton ball” appearance
- Can lead to osteosarcoma
- Limited treatment

### Cherubism
- Autosomal dominant inherited trait
- Bilateral enlargement of facial bones usually mandible
- No treatment
Odontogenic Tumors

Ameloblastoma
- A benign tumor arising from ameloblasts
- Invasive but does not metastasize
- May arise from dentigerous or primordial cyst

ameloblastoma
- Most often in posterior mandible
- Usually multilocular (soap bubble) but can be unilocular
- Treated with excision but commonly recurs

Complex odontoma
- A mixed tumor containing more than one type of tissue
- Other mixed tumor include ameloblastic fibroma
- Odontoma composed of enamel, dentin, cementum, pulp
- Most often in posterior mandible

Compound Odontoma
- A tumor composed of enamel, dentin, cementum, pulp
- Most often in anterior maxilla
- Associated with unerupted or impacted tooth, usually cuspid

cementoblastoma
- Benign tumor on root of vital tooth
- May expand bone, found in young adults
- Proliferation of cellular cementum
- Usually excised, does not recur

Odontogenic Myxoma
- Arising from mesenchyme rather than epithelium
- Multilocular
- After excision, they recur 25% of time
Calcifying, ossifying, cementifying tumors

- Calcifying epithelial odontogenic tumor is an ameloblastoma containing calcifications - is called a Pinborg tumor
- Fibroma can ossify or calcify, as can cyst, ie ossifying fibroma, calcifying odontogenic cyst

Ossifying fibroma
Irregular, smooth to thickened leukoplakia involves the dorsal, lateral, and dorsal surfaces of the tongue, which demonstrated no sign of dysplasia in multiple areas of incisional biopsy.

Smooth, velvety clinical presentation with a homogeneous surface, without ulceration. The tissue diagnosis was squamous cell carcinoma in situ.
Heterogeneous presentation of combined red and white surface alterations are noted, with an intermingling of these changes characteristic of erythroplakia noted at the lateral aspect of the soft palate and buccal mucosal interface (arrow). The tissue diagnosis was squamous cell carcinoma, minimally invasive.

Resources

- CDx Laboratories, Inc
- Oral CDx Office Reference
- Chemocare.com