



Hawaii Dental Association Convention

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*I attest that I have no conflicts of interest and have no financial interest or compensation with any dental, medical or pharmaceutical company.

Practical Concepts and Applications for Office Dental/Oral Surgery

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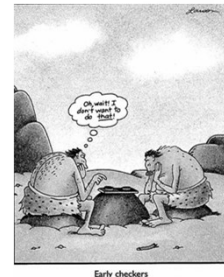
Clinical Desires of GP's

- Techniques
- Time
- Trouble



Keys to Success

- Diagnosis/Work-up
- Anxiety & Pain Control
- Techniques
- Problems



Keys to Success

- Treatment Room Preparation
- Doctor-Staff Communication
- Patient Positioning
- Doctor-Staff Positioning
- Confidence



Medical History

What answers on the Health Questionnaire will require special consideration?

- ▶ HEENT
- ▶ Cardiovascular
- ▶ Pulmonary
- ▶ GI/GU
- ▶ Endocrine
- ▶ Musculoskeletal
- ▶ Neurological
- ▶ Behavioral/Psychiatric
- ▶ Hematologic/Immunologic



Medical Concerns

Cardiovascular

- ▶ CVA/TIA
- ▶ Mechanical Valve
- ▶ Atrial Fibrillation
- ▶ DVT
- ▶ CHF
- ▶ CAD - stents
- ▶ MI
- ▶ Murmurs



"They let him come home, but he has to watch his blood pressure."

Medical Concerns

Cardiovascular

Antibiotic prophylaxis for Infective Endocarditis (AHA 2007)

- *Amoxicillin 2gm po 1 hour before treatment
- *Clindamycin 600mg po 1 hour before treatment
 - Certain specific congenital conditions (cyanosis, mesh)
 - Prosthetic Heart Valve
 - Previous IE
 - Cardiac Transplant



"I can't even pronounce what you've got!"

2021 AHA Guidelines 1 hour before treatment

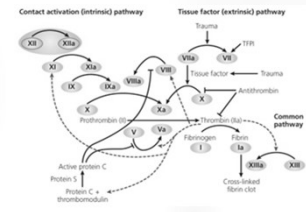
Antibiotic prophylaxis for **Viridans Group Streptococcal Infective Endocarditis** (AHA 2007); revised May 2021 (Circulation. 2021; 143:e963–e978. DOI: 10.1161/CIR.0000000000000969)

- *Amoxicillin 2gm
- *Clindamycin 600mg
- *Cephalexin (Keflex) 2 gm
- *Azithromycin (Zithromax) 500mg
- *Clarithromycin (Biaxin) 500mg
- *Doxycycline 100mg
- ? Cefaclor (Ceclor) and Clindamycin (Cleocin)
- ✓✓ Bactericidal vs Bacteriostatic

Medical Concerns

Anticoagulation

- * Coumadin – interferes with hepatic synthesis of Vitamin K- dependent clotting factors (II, VII, IX, X)
- * Plavix – prevents binding of fibrinogen by blocking receptors...effects minimum 7-10 days
- * Aspirin – inhibition of platelet-dependent thromboxane formation
- * Pradaxa – direct thrombin inhibitor
- * Xarelto – inhibits Factor Xa
- * Eliquis – inhibits Factor Xa
- * Brilinta – inhibits Factor Xa



Medical Concerns

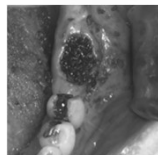
*Warfarin (Coumadin)

Care Management Institute - Cardiovascular Disease Advisory Group (December 2005)

*Peri-procedural Anticoagulation Management

"Published literature suggests that the risk of thromboembolic events outweighs the risk for bleeding for most dental procedures, and most patients should continue with full therapeutic anti-coagulation (INR 2-3.5). Local hemostatic measures are advocated."

- Local hemostatic measures
 - ▶ Application of pressure...Use of gelatin sponges...Additional sutures
 - ▶ Use of topical antifibrinolytic agents (aminocaproic acid or tranexamic mouthwash)



Medical Concerns

Musculoskeletal

- ▶ AAOS 2009 Information Statement regarding Antibiotic Prophylaxis for Bacteremia in Patients with Joint Replacements
- ▶ "Orthopaedic hardware not within a synovial joint are not at increased risk"
- ▶ ADA & AAOS Consensus (JADA 1997 & JADA 2003)
- ▶ JADA 2015



Medical Concerns

MAJOR ARTICLE

- ▶ Journal Clinical Infectious Diseases 2010; 50:8-16
- ▶ Hospital-Based Case-Control Study, Mayo Clinic
- ▶ 339 case patients and 339 control subjects undergoing high-risk or low-risk dental procedures and not administered antibiotic prophylaxis.
- ▶ Low risk: restorative, endodontic and fluoride Tx
- ▶ High risk: hygiene, surgery, periodontal and abscess Tx

Conclusion: Antibiotic prophylaxis prior to dental procedures did not decrease the risk of subsequent total hip or knee infection.

* Transient bacteremia occurs in up to 51% of normal daily activities, such as toothbrushing, flossing, and chewing.

* Bacteremia associated with a single tooth extraction lasts 6-30 minutes.

Antibiotic Prophylaxis

AAOS – Orthoguidelines App

- ✓ Quality
- ✓ Appropriate Use Criteria
- ✓ Dental Procedures

The screenshot shows the AAOS Orthoguidelines App interface. At the top, it says 'AAOS' and 'APPROPRIATE USE CRITERIA: Management of Patients with Orthopedic Implants Undergoing Dental Procedures'. Below this are fields for 'Initial Visit', 'Patient Name', 'Date of Birth', 'Phone', and 'Date'. There are sections for 'Indication Profile' and 'Treatment Recommendations'. Under 'Treatment Recommendations', it says 'Dentally appropriate to prescribe prophylactic antibiotics'. There are also sections for 'Immunocompromised Status' and 'Diabetic Glycemic Control'.

Medical Concerns

Musculoskeletal

Bisphosphonates

*Initially approved in 1995 to decrease the skeletal complications in patients with breast cancer, multiple myeloma, Paget's disease & hypercalcemia of malignancy.

*Ruggiero, et al., reported in 2001 growing number of referrals to Long Island Jewish Medical Center for E. & M of "refractory osteomyelitis".

*Remarkably similar to "Phossy Jaw" at end of 19th century!

Highly concentrated in the jaws



Medical Concerns

Bisphosphonates/MRONJ

- ▶ Preventive dental treatment
- ▶ Avoidance of dentoalveolar trauma
- ▶ Cessation of agent ("drug holiday")
- ▶ Dental clearance?

*Informed Consent



* Prolonged use in humans (more than 3 years) may cause development of poorly functional, highly multinucleated osteoclasts with nucleated condensation and poor adhesion to the bone surface.

Medical Concerns

Consultations

1. You are NOT asking permission to provide Dental treatment you are asking to co-manage the care.
2. Point out the medical problems that might alter dental treatment
3. What treatment is planned (routine vs surgical extractions, endodontic, restorative, periodontal, etc.)
 - a. Anticipated duration
 - b. Anesthesia

Record Keeping

Informed Consent

- * Options
- * Dentoalveolar
- * Anesthesia
- * Biopsy
- * Socket Preservation Grafting
- * Implant

Patient level of comprehension



"Last time I was here you said I probably needed a crip."

Chart note – "if it wasn't written down it didn't happen"

Record Keeping

- Medical History
 - *Illnesses
 - *Bleeding problems
 - *Medications
 - *Allergies
- Diagnosis
 - *Reason for surgery
- Treatment
 - *How you did it
- Complications
 - *Management
- Prescriptions
 - *Include instructions
- Follow Up



"Same time next week."

The Perfect Note

Med Hx updated and reviewed, no interval changes

BP ___ / ___ HR ___

Dx: Non-restorable # ___

Pt given the opportunity to ask questions, verbal and written consent obtained

Tx: Topical applied, 1.7 mL 2% Lidocaine w/ 1:100K epi

Routine Ext # ___ with luxator/elevator and forceps technique without apparent complications

Verbal and written post-op instructions given along with gauze sponges

F/U one week

Anxiety & Pain Control

- Local Anesthesia
- Sedation ("Conscious")
 - *Nitrous Oxide
 - *Oral
 - *Intravenous



"Will you RELAX! ... it's a mirror!"

Local Anesthesia

"There is no substitute for profound local anesthesia"



"Nurse, run outside and get his shoe."

Anxiety & Pain Control

- Nitrous Oxide
 - *Not much dissolves in blood however rapidly diffusible, therefore saturates the blood resulting in rapid onset and rapid recovery



"Dentistry's come a long way in the last few years."

Anxiety & Pain Control

- Nitrous Oxide Contraindications
 - *Sinusitis/Eustachian tube problems
 - *COPD (hypoxic drive)
 - *Pregnancy



"Will you quit whimpering? I'm cleaning my glasses!"

Anxiety & Pain Control

Nitrous Oxide Indications

- * hyperactive gag reflex
- * anxiety/phobia
- * painful stimuli



"You'll have to sit up."

✓✓ Fire Safety

- *Maximize safety and minimize risk



Anxiety & Pain Control

Oral "Conscious" Sedation

*Benzodiazepines

-facilitate inhibitory GABA neurotransmission by binding to benzodiazepine receptors

- Diazepam (Valium®)
- Lorazepam (Ativan®)
- Triazolam (Halcion®)
- Midazolam (Versed®)
- Alprazolam (Xanax®)



"WILL YOU PLEASE KEEP YOUR ARMS DOWN!"

D9248

Anxiety & Pain Control

Oral "Conscious" Sedation

Triazolam 0.125-0.25mg

- *rapid onset
- *peak ~ 1-2 hours
- *t_{1/2} ~ 1.5-5.5 hours
- *No active metabolites
- *anterograde amnesia...CONSENT
- *occasional paradoxical disinhibition reaction (0.5mg dose*)

*Sublingual administration increases bioavailability/analgesia by 28% (OCC-1997 NIH)

Anxiety & Pain Control

Flumazenil 0.1 mg/mL (5 mL vial)

*Imidazobenzodiazepine that competitively inhibits the benzodiazepine site on the receptor complex

*0.5 mg required to occupy 50% of the receptors

*onset ~ 1-3 minutes

*peak ~ 6-10 minutes

*t_{1/2} ~ 40-80 minutes

*resedation in 60-90 minutes; level of resedation is 13-30%

**contraindication: Seizure disorder

NSAID's...

*Naproxen (Aleve) + Acetaminophen (Tylenol)

*Ibuprofen (Advil) + Acetaminophen (Tylenol)

*Naproxen (Aleve)

*Ibuprofen (Advil)

*Acetaminophen (Tylenol)

?Opioids

✓Tylenol #3...Hydrocodone...Oxycodone...Tramadol

What about patients who cannot take NSAIDs?

Dentoalveolar Surgery

Armamentarium

What criteria do you use or did you use in selection of equipment?

- "That is what we used in dental school"
- "That is what we used in GPR/AEGD"
- "That's what was there when I bought the practice"
- "That's what my dental supply rep said was good"
- "That's what I learned at a course"

Dentoalveolar Surgery

Basic Armamentarium

- *Local anesthesia
- *Suction
- *Mirror
- *Retractor
- *Periosteal elevator
- *Elevator
- *Forceps



Dentoalveolar Surgery

Basic Armamentarium

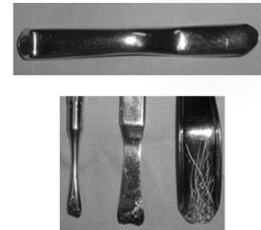
- *Local Anesthesia
- Syringe type
- Needle choice
- Anesthetic choice



Dentoalveolar Surgery

Basic Armamentarium

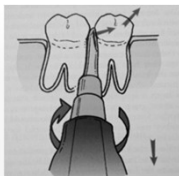
- *Retractor
- Mirror
- Periosteal
- Seldin
- Minnesota
- Austin



Minimally Invasive Exodontia

Elevator

- 301
- 34S
- E303
- 77R
- 92R



*Luxator®



EL3S



Dentoalveolar Surgery

Flap Armamentarium

- ▶ Needle Holder
 - *Crile-Wood
- ▶ Scissors
 - *Curved Kelly
- ▶ Scalpel handle
 - #15 blade
- ▶ Irrigation syringe
- ▶ Surgical handpiece
- ▶ Surgical bur

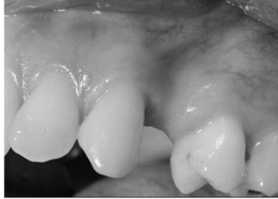


Implant Site Considerations

Alveolar Bone Loss...

*first few months following extraction

- 1-3 mm loss of height
- 3-5 mm of width
- Questionable density
- Soft tissue issues



Socket Management

Biology of Bone

Alveolar bone loss

✧Can anything be done clinically to eliminate or reduce this phenomenon?

- Hydroxylapatite cones and particles
- Barrier membranes
- Immediate implant placement
- Socket preservation graft

Socket Management

Biology of bone

Alveolar bone loss

- ▶ Use of a guided tissue regeneration membrane alone, with no underlying graft material, reduces bone loss
- ▶ Use of a particulate material alone with no membrane results in a reduction of bone loss
- ▶ Implants placed immediately into extraction sockets integrate predictably if graft material is used

* Particulate grafting materials differ in terms of their resorption profile and may interfere with normal bone formation

Socket Management

Ideal Bone Graft Material

Osteoconductive, bioresorbable providing a three-dimensional lattice with ideal dimensions for ingrowth of new blood vessels and osteoprogenitor (stem) cells

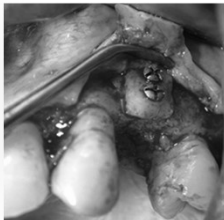
Osteoinductive, capable of recruiting and encouraging the migration of osteoprogenitor cells into the site

Osteogenic, containing vital cellular elements capable of forming bone or differentiating into osteoblasts

Socket Management

Autogenous Bone

- ▶ Osteoconductive, osteoinductive and osteogenic properties
- ▶ No antigenic properties
- ▶ Zero risk of disease transmission



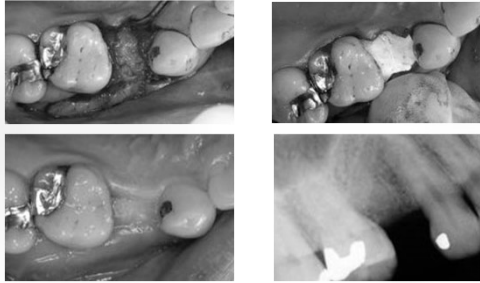
Socket Management

Bone Grafting Materials

- ▶ Autogenous
- ▶ Allograft (cadaver)
- ▶ Xenograft (bovine, coral and algae)
- ▶ Alloplast (hydroxylapatite, bioactive glass, polymers, calcium sulfate, tricalcium phosphate)

Socket Management

Allograft with collagen plug membrane



Problems

"If you practice long enough everything that happens to other people will happen to you"



"C'mon, c'mon—it's either one or the other."

Post-extraction Pain

- ✓Traumatic extraction
- ✓Sharp alveolar bone
- ✓Edema
- ✓Trismus
- ✓Alveolar Osteitis
- ✓Foreign body
- ✓No apparent cause

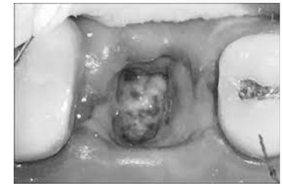


Post-extraction Pain

Alveolar Osteitis...Dry Socket

First described by Y. Crawford of Charlestown, West Virginia in *Dental Cosmos*, Nov. 1896

- * unrelieved pain
- * radiating pain
- * foul odor/taste
- * broken down clot



Dry Socket Risk Factors

- ✓Excessive force
- ✓Excessive time
- ✓Inadequate irrigation
- ✓Smoking
- ✓Oral contraceptives
- ✓Smoking + oral contraceptives
- ✓Mandible 9:1

Alveolar Osteitis

Management/Remedies

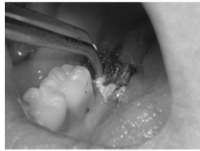
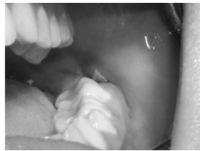
- *1/4" Iodoform gauze-Eugenol
- *1/4" Plain gauze-Eugenol
- *Gelfoam-Eugenol
- *Gelfoam-Dry Socket Paste® (Sultan)
- *Dressol-X®
- *BIPP/TAPPE
- *ACE Filament Gauze-Eugenol
- *Alvogyl® (Septodont)
- *OraSoothe – Sockit gel (Septodont)



Alveolar Osteitis

Medicaments

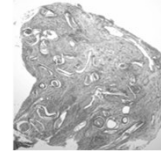
- *Tetracycline powder
- *Aspirin powder
- *Petrolatum...myospherulosis
- *Iodoform
- *Phenol
- *Thymol
- *Bismuth
- *Zinc Oxide
- *Tincture of Myrrh
- *Chlorobutanol
- *Balsum of Peru
- *Guaiaicol
- *Benzocaine
- *Butamben
- *Eugenol



Alveolar Osteitis

Medicaments

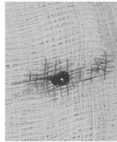
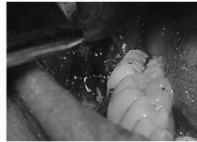
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- *Balsum of Peru
- *Guaiaicol
- *Benzocaine
- *Butamben
- *Eugenol



Alveolar Osteitis

Prevention

- ✓ Foreign Body result
- Alexander, R. JOMS (May 2000) Dental extraction wound management: A case against medicating postextraction sockets
- OraSoothe® – "Socket gel" (Septodont)



Complications

- *Unable to obtain profound local anesthesia
- *Fractured crown
- *Fractured root(s)
- *Displaced tooth
- *Displaced root
- *Antral communication
- *Tuberosity fracture
- *Bleeding
- *Broken instrument
- *Paresthesia
- *Surgical Emphysema



"Stay there, I got the wrong one."

Complications

Root Fracture

*When Do You Remove?

1. Apical Infection
2. 1/3 to 1/2 Root Remains
3. Loose



Complications

Root Fracture

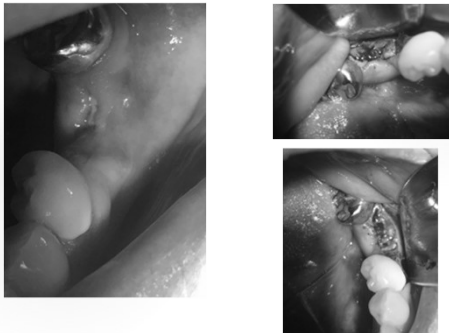
*When Do You Retain?

1. Cannot Visualize
2. Anatomic Considerations
 - *Sinus
 - *Nerve
3. Hemorrhage
4. Patient Discomfort

- *Inform Patient
- *Post-op Periapical
- *Document



Sharp Alveolar Bone



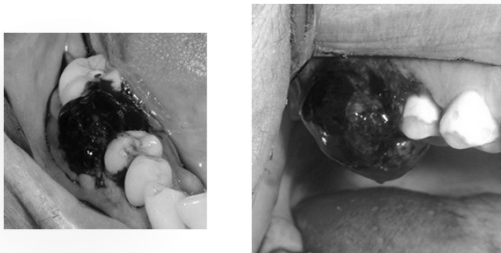
Complications

- Hemorrhage
 - * bone
 - * soft tissue
 - * granulation tissue
 - * neurovascular bundle



Complications

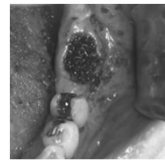
Bleeding



Complications

D7922

- Bleeding
 - * gauze and pressure
 - * curettage and pressure
 - * cautery (chemical, laser, electrical)
 - * Gelfoam®, Surgicel®, ActCel®, BloodStop®, Surgi-Stop®, CollaPlug®, HemCon®, CELOX®
 - * QuikClot®
 - * Bone Wax



Complications

- Antral communication
 - * intact membrane
 - * membrane perforation
- **Allow for normal clot...if Sx's
 - *Antibiotic
 - Amoxicillin/Clindamycin
 - *NeilMed Sinus Rinse
 - Introduced ~2000



Complications

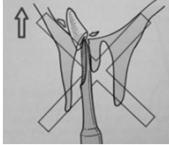

- Displaced tooth
 - * sinus
 - * infratemporal fossa
 - * nose
 - * digestive tract
 - * airway/bronchus



Complications

Displaced root

- * Sinus
- * Facial (buccal/labial)
- * Lingual
- * Canal

Complications

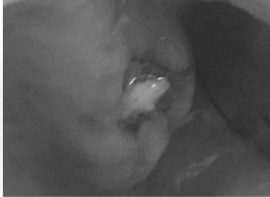

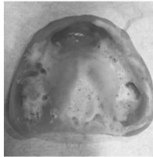
Foreign Body





Complications

► Tissue Conditioner

Complications

Surgical Emphysema

- Four fatalities
- Two loss of vision
- Numerous hospitalizations





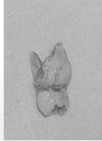
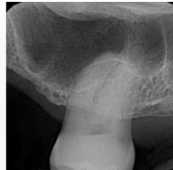
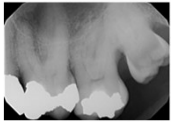
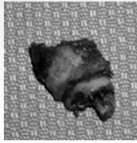

Non-healing extractions





Complications

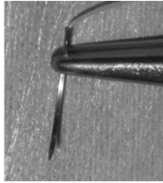
Tuberosity fracture/Mucosal tear

Complications

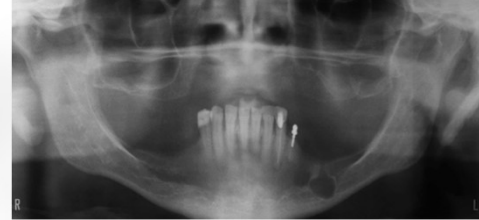
Broken instrument

- * anesthetic needle
- * bur
- * elevator tip
- * suture needle

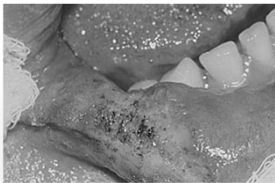


Complications

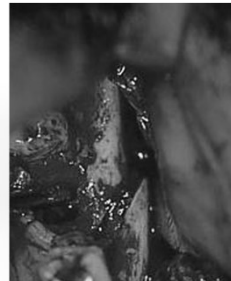
Residual Periapical Cyst



Complications



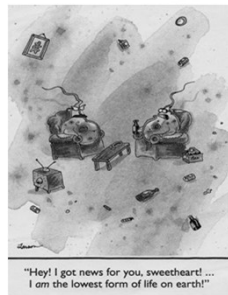
Complications



Infections

- *Aerobic gram (+) cocci
- *Anaerobic gram (-) cocci
- *Anaerobic gram (-) rods

- * 5% aerobic only
- * 35% anaerobic only
- * 60% mixed



Infections

*Typically aerobic bacteria inoculate deeper tissue which initiates cellulitis...anaerobes follow then predominate

*Origins: periapical
periodontal



Infections

History of Present Illness

- * duration
- * onset
- * speed of spread



Infections

Cardinal Symptoms & Signs

- * rubor (redness)
- * calor (temperature)
- * dolor (pain)
- * fetor (odor)
- * functio laesa (loss of function)

Infections

Examination

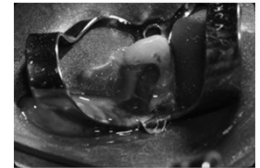
- * Vital signs
- * Swallowing/breathing
- * Opening
 - trismus
- * Swelling
 - indurated
 - fluctuant
- * Imaging
 - periapical
 - panoramic
 - CT



Infections

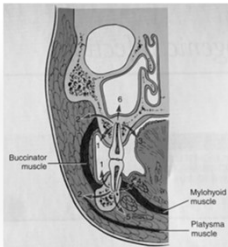
Management

- * Remove cause
 - endodontic (? I & D)
 - periodontic (? I & D)
 - extraction (? I & D)
- * Antibiotics



Infections

I & D



Infections

Antibiotic Therapy

- * narrowest spectrum
- * least toxic – side effects
- * bactericidal
- * cost
- * compliance



"Last time I was here you said I probably needed a cap."

Infections

Penicillin is drug of choice

*~3 % of population is allergic

*500mg q6h for 7 days

*Amoxicillin 500mg q8h is acceptable first alternative ("Trimox®")... 10p/6a/2p

*Consider Amoxicillin 875mg q12h for compliance issues

Infections

Metronidazole (Flagyl®)

*enters cell of anaerobic gram (-) bacilli, particularly Prevotella and promotes unstable compounds which bind to DNA and inhibit cell synthesis

* good tissue penetration

* warn patient about alcohol consumption

* 250-500mg q6h with PCN

Infections

Cephalosporins (1st generation)

*Cephalexin (Keflex®)

- ineffective vs gram negative cocci

- 500mg q6h

Infections

Cephalosporins

*2nd generation... Cefaclor (Ceclor®)

- effective vs Prevotella

- 250-500mg q8h

* 3rd generation... Cefdinir (Omnicef®)

- 300mg q12h

Infections

Clindamycin (Cleocin®)

* significant tissue penetration

* serum levels exceed MIC at least 6 hours after recommended doses

* effective vs Prevotella

* 150-300mg q6h

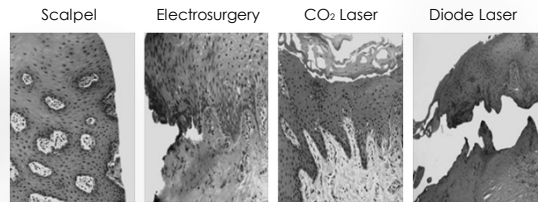
✓300 mg capsule 3x more expensive!

Biopsy Devices

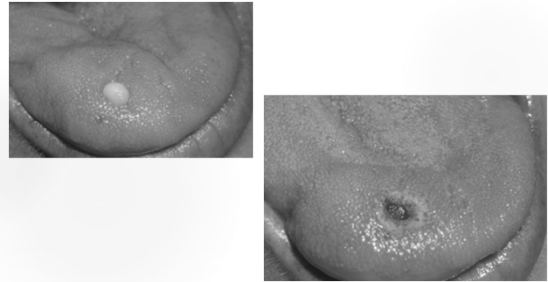
- Scalpel
- Scissors
- Tissue Punch
- Electrosurgery
- LASER



Surgical Specimen

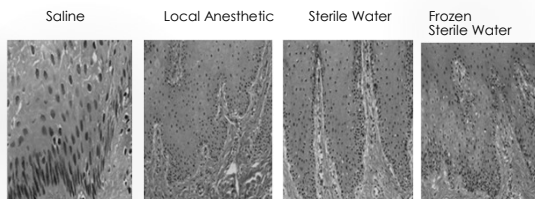


Technique of Biopsy



Specimen Handling

Formalin



Specimen Submission

Critical Information

- ▶ Type of biopsy (excision vs. incisional)
- ▶ Site of biopsy
- ▶ Clinical information
 - *History, size, location, duration, color, texture, configuration, consistency, mobility, associated pathology, radiographic appearance...the more accurate and reliable will be the report.

Medical Emergencies

Recognition

- ▶ ABC
- ▶ Level of Consciousness
 - *AVPU
 - Alert
 - Verbal
 - Pain
 - Unresponsive
- ▶ Cause
 - Respiratory
 - Circulatory
 - Neurologic
 - Metabolic



Medical Emergencies

Communication

*Basic Equipment

1. Oxygen
2. Suction
3. Lighting
4. Monitoring
5. AED?



Are we ready?

What should we have?

- A – Aspirin
- B – Bronchodilator
- C – Coronary artery dilator
- D – Diphenhydramine (antihistamine)
- E – Epinephrine
- F – Fainting (Ammonia inhalant)
- G – Glucose



Medical Emergencies

Vasodepressor Syncope

*Brain continuously requires oxygen and glucose but cannot store them so when vasodepression occurs there is vasodilatation and blood pools in the extremities.

*Best treatment is to tilt body with the head down and place a cold compress to initiate vasoconstriction.



3rd Molar Management

“Asymptomatic” does not mean disease free!

Evidence based medicine and dentistry

- Prophylactic, by definition, indicates that a disease-free state already exists
- Morbidity associated with the surgical management as well as the risk of complications has been clearly shown to increase with increase age

3rd Molar Management

- ↪ Periodontal disease
- ↪ Non-restorable caries
- ↪ Damage to adjacent teeth
- ↪ Infections
- ↪ Cysts
- ↪ Tumors

3rd Molar Management

Coronectomy



3rd Molar Management

Coronectomy



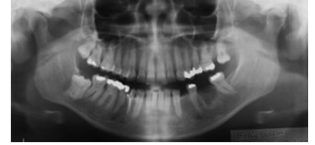
3rd Molar Management

Coronectomy



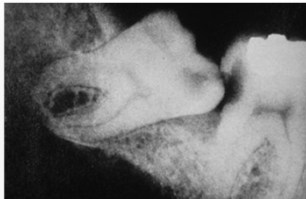
3rd Molar Management

Periodontal Disease



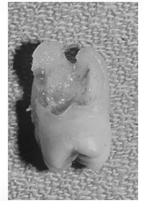
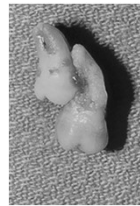
3rd Molar Management

Dental Caries



3rd Molar Management

Damage to adjacent teeth



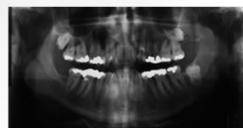
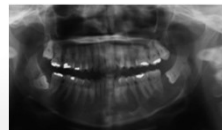
3rd Molar Management

Infections



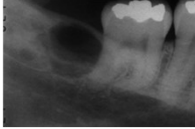
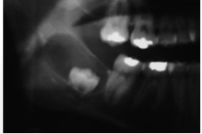
3rd Molar Management

Cysts



3rd Molar Management

Tumors



Mahalo nui loa!

