

Dental Treatment of a Medically Compromised Patient



Patient Health History



- 3 year old, Asian female presents with mother (829.11)
- DOB: 10/24/2007
- CC: patient's mother states that she has cavities, which need to be treated. She is currently not experiencing any dental pain.
- ASA Type II: Diagnosed with asthma (last attack 10/2011, taking albuterol) and cardiac arrhythmia—sees a cardiologist every 4 mo. (last exam 8/2011)
- Birth Hx: Born full term, C-section. Immunizations UTD.
- Patient slightly smaller in height and lighter in weight for her weight (32.6 lbs)
- Primary dentition.
- Last dental visit, no previous dental trauma
- Poor dental home care: patient gets juices/soda/milk often via sippy cup and regular cup. Discussed better OI and dietary habits with mother.

Social and Family History

- Nylie is the only child and lives with her mother (homemaker) and father (employed by Kaiser) in Waianae, HI
- In Waianae, about 17.2% of families and 19.8% of the population living below the poverty line
- Patient does not attend school
- Very quiet and shy; does not speak at all during appointment, but communicates with MOC; MOC states that patient is usually very quiet at home.

Normal Cardiac Function

- The SA node sends out regular electrical impulses causing the atrium to contract and to pump blood into the ventricle
- The electrical impulse then passes to the ventricles through a form of junction box called the AV node (atrio-ventricular node)
- This electrical impulse spreads into the ventricles, causing the muscle to contract and to pump blood to the lungs and the body.

Dental Management of the patient at risk for a cardiac arrhythmia

- Management considerations of coexisting conditions: manage as indicated by the nature of the underlying cardiac problem
- Reduce patient anxiety. Premedication with a short acting benzodiazepine the night before the appointment or an hour before is helpful. Nitrous oxide-oxygen inhalation sedation can also be used during dental treatment.
- Minimize stressful situations. Patients should be treated during short morning appointments. Session should be terminated if the patient becomes fazed, to prevent or minimize acute exacerbation of conditions that might trigger arrhythmia

- Avoid excessive amounts of vasoconstrictive agent and local anesthetic considerations: Excessive amounts of epinephrine can trigger arrhythmia or another adverse cardiovascular event.
- Avoid general anesthesia: patients at risk for developing significant cardiac arrhythmias and those with significant arrhythmias should not be given general anesthesia in the dental office because of the increased risk of MI, congestive heart failure, or death.
- Use caution around electrical equipment.

Clinical Findings

EOE and IOE: WNL

Occlusal Findings:

Mesial step right and left
Class I canine relation right and left

Cross bite: #C to G
Overbite: 40%
Overjet: 0mm
Midline: on

Treatment Options



- Brief clinical exam shows that patient has several restorative needs.
- Behavior: patient is mostly cooperative but very quiet and slightly apprehensive
- Following treatment options discussed with mother:
 - Treatment without any pharmacologic sedation methods
 - Use of nitrous oxide
 - Oral sedation
 - Operating Room (General Anesthesia)
- Mother interested in trying treatment with nitrous oxide first

Use of Nitrous Oxide (4.22.11)



- Due to patient's existing condition of cardiac arrhythmia, medical consult to cardiologist was written. However, we did not receive word from cardiologist in time and lost touch with the mother. Rc'd 9.12.11

Reason for medical consult: _____ Date of treatment: _____

Medical clearance to perform dental treatment based on antibiotic prophylaxis: YES NO

Other: PLEASE REPORT ANY MEDICATIONS REQUIRED FOR DENTAL TREATMENT. PATIENT IS PLANNED FOR RESTORATIVE PROCEDURES WITH LOCAL ANESTHETIC (ARTD) AND NITROUS OXIDE.

Physician clearance or comments: _____

Approved for dental treatment: YES NO

Other: May provide dental care with caution as the child has cardiac arrhythmia. Use least amount of epinephrine as they are known to enhance cardiac arrhythmias.

S. V. K. A. 9/1/11

Treatment Under General Anesthesia (Sept. 2011)



Reason for medical consult: _____ Date of treatment: _____

Medical clearance to perform dental treatment: YES NO

Other: PLEASE REPORT ANY MEDICATIONS REQUIRED FOR DENTAL TREATMENT. Patient is planned for restorative procedures with local anesthesia (including ep) under General Anesthesia.

Physician clearance or comments: _____

Approved for dental treatment: YES NO

Other: Should be performed in Hospital under Anesthesia. See notes on...

Goals of General Anesthesia

- Patients with certain physical, mental, or medically compromising conditions
- Patients with dental restorative or surgical needs for whom local anesthesia is ineffective because of acute infection, anatomic variations, or allergy
- The extremely uncooperative, fearful, anxious, physically resistant or uncommunicative child with substantial dental needs and no expectation that the behavior will soon improve
- Patient who have sustained extensive orofacial and/or dental trauma
- Patients with immediate comprehensive oral/dental needs who otherwise would not receive comprehensive dental care
- Patients requiring dental care for whom the use of general anesthesia may protect the developing psyche and/or reduce medical risks.

In the OR...

- When the anesthesiologist received word that the patient had PACs, she wanted to have EKG information from her cardiologist to review it
- We did not have the information, so we called her cardiologist and obtained information
- For future OR cases on patients with significant medical history, it was decided that information be sent to the anesthesiologist 1 week prior to OR case

General Anesthesia and Cardiac Arrhythmia

- There was a strong association between halothane and ventricular arrhythmias, especially ventricular tachycardia. The use of sevoflurane in preference to halothane could contribute to a decline in morbidity and mortality associated with dental anesthesia¹
- Some studies have demonstrated that the use of propofol is occasionally associated with bradyarrhythmias or reversion of arrhythmias to sinus rhythm. This property of propofol suggests interference with the Cardiac Conduction System (CCS). The studies seem to indicate that propofol probably interferes in automatic SVT (at least in children), but not in reentrant tachyarrhythmias.²

1. Cardiac arrhythmias in children during outpatient general anesthesia for dentistry: a prospective randomised trial. MR Blayney, FRCA, AJ Mallin, FRCA, GM Cooper, FRCA

2. Effects of propofol on the cardiac conduction system. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1451101/>

Pre-Treatment Radiographs (OR Date: 1.20.12)

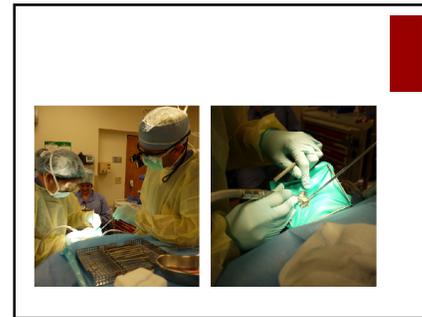


Maxillary Right



Mandibular Right





Kinder
CROWNS

Kindercrown-Preparation

- Gross reduction of tooth (Incisal, Interproximal, Buccal, Lingual). Preparation is very similar to that of plain stainless steel crowns, but it requires slightly more tooth reduction. This increased reduction is necessary to properly fit an appropriately sized crown, making the restoration as natural looking as possible. **You will need an extra 15 - 20% tooth reduction.** In your initial preparation most dentists use a football-shaped carbide, or 855 tapered diamond. But again, this depends completely on your preference. a. During sub-gingival reduction, it is important to avoid damaging the gingival tissue. A flame-shaped diamond such as a 368 or a 330 tapered bur can be used for the lingual preparation. These burs can also create a nice feather-edge, or knife-edge margin, which is recommended.

Kinder
CROWNS

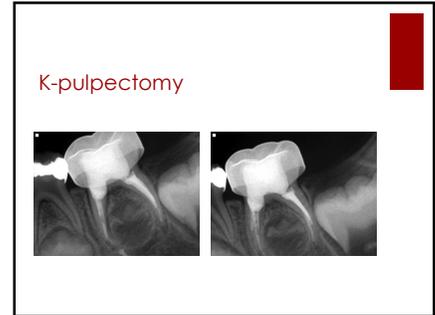
Kindercrown-Cementation

- After the preparation is complete and all of your crowns fit passively, the crowns can be filled with your cement of choice. Many dentists are using a resin-modified glass ionomer, but whatever you use with stainless steel crowns is fine. Fill crown with composite of choice and place on prep.



Post-op Appointment (2.3.12)

- Patient is healthy
- Soft tissue/Hard tissue Exam WNL
- Mother reports that patient has not been experiencing any pain
- Kindercrowns and SSCs are doing well



Pulpectomy—Objectives*

- Following treatment, the radiographic infectious process should resolve in 6 months, as evidenced by bone deposition in the pretreatment radiolucent areas, and pretreatment clinical signs and symptoms should resolve within a few weeks.
- There should be radiographic evidence of successful filling without gross overextension or underfilling.
- The treatment should permit resorption of the primary tooth root and filling material to permit normal eruption of the succedaneous tooth.
- There should be no pathologic root resorption or furcation/apical radiolucency.

*AAPD reference Manual

Success of Pulpectomy With Zinc Oxide-Eugenol Vs Calcium Hydroxide/Iodoform Paste in Primary Molars: A Clinical Study

- Compare clinical and radiographic success rates of zinc oxide-eugenol cement (ZOE) vs calcium hydroxide/iodoform paste (Vitapex) in pulpectomized primary molars at 6 and 12 months.
- At 6 and 12 months, the ZOE success rates were 48% and 85%, respectively, and the Vitapex success rates were 78% and 89%. The difference in success rates between materials at 6 months was statistically significant, but at 12 months it was not.
- Vitapex appeared to resolve furcation pathology at a faster rate than zinc oxide-eugenol at 6 months, while at 12 months, both materials yielded similar results.

Trairatvorakul, Chulima; Chuntasakulwan, Salinee; *Pediatric Dentistry*, Vol 30 Num 4, July/August 2008