Wolff-Parkinson-White Syndrome: Considerations for Chairside Dental Treatment

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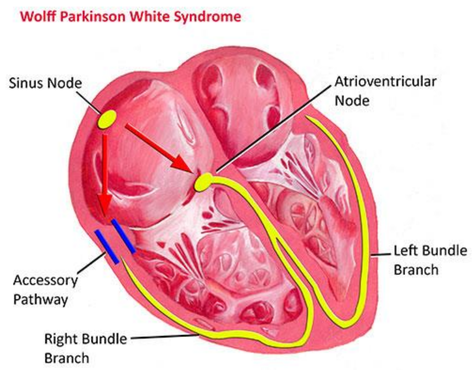
BACKGROUND

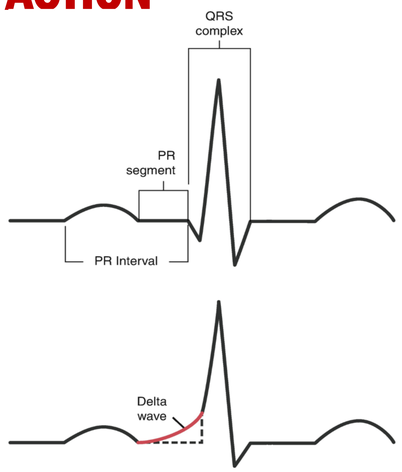
Wolff-Parkinson-White syndrome is a condition in which a patient has supraventricular tachycardia as well as pre-excitation. Pre-excitation involves the activation of the ventricles earlier than expected through a normal atrioventricular conduction system.
This issue with early excitation is typically due to an accessory pathway that bypasses the atrioventricular (AV) node. The AV node acts as a gate, regulating the amount of electrical activity and excitation of the heart. This impulse then continues cyclically until it reaches a block. This can lead to reentrant tachyarrhythmias, causing a cycle of repeated excitations. During an episode, a individual's heart rate can reach 150 to 220 BPM at rest.[4]

DENTAL CONSIDERATIONS

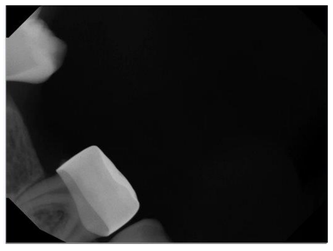
Wolff-Parkinson-White Syndrome can remain asymptomatic or hidden until a sudden onset of supraventricular tachycardia triggers. The resultant cyclic tachycardia episode can continue as the patient develops symptoms. The typical symptoms noted are fatigue, dizziness, syncope, and angina. If the episode includes paroxysmal atrial fibrillation and flutter, leading to ventricular fibrillation, sudden death can occur.[1] Dental management first involves active communication and treatment planning with the patient's cardiologist and other physicians. The patient may be taking medications, or even in some cases have a pacemaker, to keep their tachycardia under control. Even with this, it is still crucial to discuss special considerations with the cardiologist to minimize the risk of tachycardic episodes. Signs of arrhythmia may require further evaluation before initiating dental treatment. Most dental work falls under the low cardiac risk category; however, certain oral surgery procedures may be considered intermediate cardiac risk.[1] Perioperative management strategies are predominantly focused on reducing stress and anxiety. This is important to minimize the chance of excitation leading to tachycardia. The major recommendations for minimizing stress in children with dental anxiety involves judicious use of nitrous oxide and the use of nonpharmacological behavior guidance modalities.[2] No contraindications to nitrous oxide are noted for patients with pre-excitation or tachycardic syndromes.[3] Furthermore, if the patient starts to tire or negative behavior develops, the treatment may be terminated in order to prevent the exacerbation of anxiety and stress that may trigger tachycardia.[1] Avoiding excessive amounts of epinephrine can reduce the risk of episodes developing perioperatively, never exceeding 3 cartridges (5.4mL) of lidocaine for any patient at an increased risk of arrhythmia.[1]

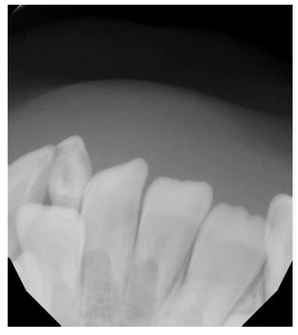
MECHANISM OF ACTION

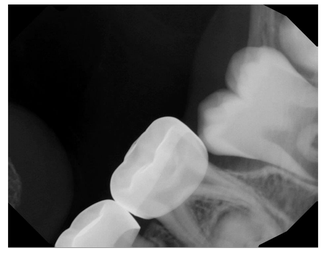




RADIOGRAPHS







CLINICAL PRESENTATION

7-year-old-male presented to an outpatient pediatric dentistry resident clinic to obtain clearance for an upcoming cardiac ablation procedure. The patient's history is positive for Wolff-Parkinson-White Syndrome and was taking Nadolol. Patient reported sensitivity to cold liquids and occasional pain upon biting which affected the upper anterior teeth. Clinical presentation: No soft tissue pathology noted. Exam revealed clinical decay on teeth #D-G (upper anterior primary incisors) as well as incipient lesions on #C and #R. The gingival tissue was pink in color, no abnormal inflammation or swellings were noted. Radiographs were taken and confirmed decay was encroaching or communicating with the pulp for all affected teeth. Dental history includes previous comprehensive dental treatment in operating room under general anesthesia. Treatment involved SSCs, pulpal therapy, resin composite fillings, and 6mrc appointments after OR.

TREATMENT/MANAGEMENT

A consult was sent over to the patient's cardiologist who requested that any teeth with potential to abscess be managed with definitive treatment. Cardiologist cleared the patient for extractions chairside with nitrous oxide, and with very limited epinephrine use. The patient was treated with the use of nitrous oxide to minimize anxiety. A single cartridge of lidocaine with 1:100,000 epinephrine was used via local injection on the sites of teeth #D-G. Palatal injection was done as well to minimize peri-operative discomfort. Distraction technique through constant conversation with the patient was extremely helpful in getting through treatment with minimal stress and overall patient behavior was great. Simple extractions of #D-G were completed, and good hemostasis was achieved. The patient had the ablation procedure completed as scheduled and will return for a 3-month evaluation for incipient lesions on #C and #R.

REFERENCES

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