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Dr. Mack

Alphaprodine-hydroxyzine sedation technique for children — a conservative approach

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I want to begin by first describing our practice. We have a group practice consisting of myself and five associates, including three pediatric dentists and two general practitioners; in addition, we employ a relatively large staff consisting of 15 employees. Our office is in operation six days a week with two dentists practicing at any one time.

Our patient profile in the office is one that is quite a cosmopolitan ethnic mix. In San Francisco, as many of you know, we have many patients that have come from Southeast Asia. We have quite a number of them in our practice and we commonly see rampant decay. This has presented us with the major challenge of providing restorative care for this particular population. We also have many patients with rampant caries from Philippino and other ethnic populations within San Francisco. Many come from other countries and present severe problems caused by dietary patterns and lack of attention to hygiene and fluoride.

We are also concerned about the very young patient under two years of age and of very low weight, often under 20 lbs. In this group of patients we have, for the most part, attempted to use a conservative sedation technique. In this approach we have not only attempted to keep our drug dosages very low, but have also attempted to avoid sedating high risk individuals, particularly those of young age and low weight.

For treating these different patients, our office had used alphaprodine in combination with hydroxyzine. When alphaprodine was voluntarily withdrawn from the market by Roche late last year, we had to look for alternatives. We first were very excited about the thought of using fentanyl. For various reasons we became rather quickly disillusioned (over several weeks) with the lack of efficacy of this medication. There was a lack of euphoria, lesser sedative qualities, less reliability, and a lack of the consistent response that we had been used to with alphaprodine.

Our usual target population for the use of alphaprodine is children who are three years old and above, generally weighing 14-16 kg (30-35 lbs) or more. Sometimes we will sedate 6-, 8-, or 10-year-old children and occasionally an older individual, such as a teenager, seen for extractions or enucleations for orthodontic purposes.

Our office philosophy is to utilize this technique to avoid hospitalization. In the seven years that I have been in practice, we have been successful in totally avoiding the use of general anesthesia.

The dosage baseline from which we work is .44 mg of alphaprodine per kg of body weight (1 mg/5 lbs). This dose has been effective in about 60-80% of our cases. I think we really should be very cautious about aiming for 90-95 or 100% efficacy because we would probably be overdosing and overtreating patients. We have not had any significant sedation-related misadventure in our office.

I would magnify, amplify, and underline in bold stroke, the concept of avoiding reinjection of sedative drugs in children. Regardless of dosage — low, medium, or high — avoid reinjection at the same appointment. I think reinjection can only create the potential for increased problems, and that it is a procedure that simply needs to be eliminated in the office. We unequivocally state that reinjection is something that we will not do under any condition.

Our medication dose consists of 6 mg of alphaprodine in combination with 6.25 mg of hydroxyzine. We use a 1 cc tuberculin syringe with a 27 gauge, one-half inch needle (Figure 1).

The drugs are administered with the child sitting. The assistant holds the patient's arms at the wrist so that the child cannot raise his hands and interfere with the injection procedure. The operator stands behind the patient, retracts the lip and injects into the mucobuccal fold adjacent to the maxillary primary second molar, aiming 45° back in the mouth and 45° toward the bone so as to avoid entering the vasculature (Figures 2 and 3). I think that postoperative swelling can be minimized by utilizing this

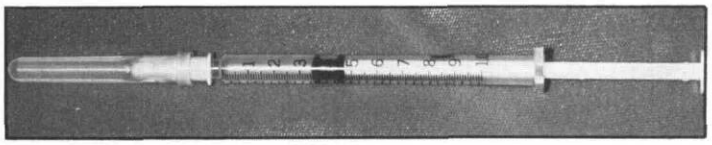


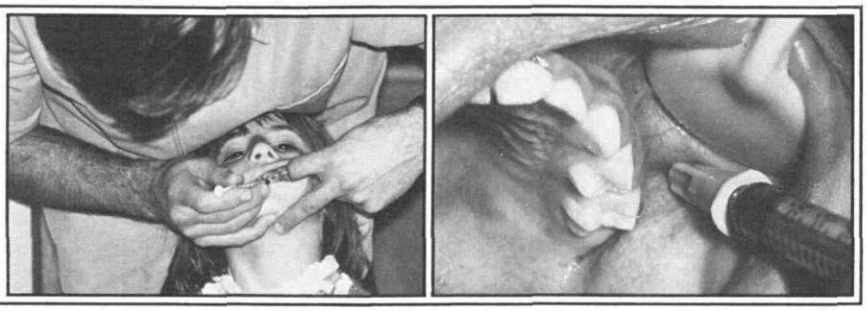
Figure 1. Full view of filled syringe containing the sedative.

technique. The injection should be given relatively slowly. It doesn't take a great deal of time to inject .35 cc and yet I think that too rapid an injection will cause greater tissue reaction. Following administration, it is essential that one use a Destruclip® or some other similar device to cut off the end of the needle before disposing of it to avoid the possibility of a second use (Figure 4).

We have naloxone available at all times. We routinely pre-draw .5 cc (0.2 milligram) of naloxone in a tuberculine syringe which is marked so as to distinguish it from other syringes. We keep this color coded syringe at the side of the patient and, if not used, will keep it for approximately a week and then dispose of it. We also have a second full ampul at chairside should we need to reinject, since the narcotic action may last longer than the 30 minute half-life of naloxone.

Figure 2. Technique for administering the sedative to the patient (left).

Figure 3. Intraoral view illustrating the mucobuccal injection site, adjacent to the maxillary primary second molar (right).



In terms of emergency management, aromatic spirits of ammonia has not been mentioned and I would like to strongly suggest that it be available in every operatory, maybe on every tray setup. One of these ampuls can be used should the child exhibit a lack of responsiveness or be difficult to arouse. Of course it is also important to have an antihistaminic available such as diphenhydramine hydrochloride (Benadryl®). This is used in our office only as an emergency drug.

After patients are sedated and the treatment is nearly completed, we begin administering a 100% oxygen flush and leave them on that throughout the remainder of the procedure to help combat the possibility of hypoxia. We find this kind of high profusion of oxygen very beneficial and very relaxing for the patients. Many times they may be on 100% oxygen flow from one-third to two-thirds or more of the procedure.

I would suggest that there are a minimum of four advantages to the use of nitrous oxide/oxygen with this sedation technique:

1. euphoria,
2. the nasal hood makes it more difficult for the patient to observe the procedure,
3. it acts as a foreign body barrier for amalgam or enamel chips flying through the air,
4. the immediate availability of 100% oxygen when utilizing the nitrous oxide/oxygen system.

We use local anesthetic on a routine basis in the form of 2% xylocaine with 1 to 100,000 epinephrine. We feel that the minimum amount of local anesthetic should be used. Recently, a technique requiring one-half to one-third of the anesthetic volume usually used has become available with the introduction of intraligamentary anesthesia utilizing a Ligmaject® or Peri-press®. We have in large part supplanted the need for infiltration and mandibular block anesthesia by use of intraligamentary injections and are using one-quarter to one-half as much anesthetic as we once used for the same procedures under similar clinical conditions. This is a major advantage in terms of the toxicity of the xylocaine and its interaction with the narcotic.

We have found that the alphaprodine and hydroxyzine work compatibly to provide a remarkably consistent level of sedation and anxiety control. The patients become more quiet, drowsy and cooperative; they make vastly improved dental patients.

We also find that the use of these agents commonly permits the treatment to be done in less time, enabling dental office productivity to be significantly increased. Furthermore this technique promotes the treatment of behavior problem children within the

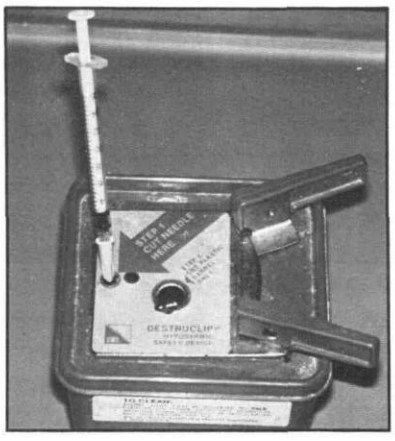


Figure 4. Destruclip® being used to cut the needle in order to prevent reuse.

dental office rather than in the hospital utilizing general anesthesia.

In addition to the use of this pharmacologic approach in treating routine restorative cases, we found it particularly helpful in controlling anxiety during the treatment of oral or dental trauma.

We have occasionally noted postoperative facial swelling. We generally find this an insignificant problem. This possible side effect should be mentioned preoperatively to the parents or guardians so that they are not surprised if this does occur. We also require the patient be NPO for four to six hours before the appointment and prefer morning appointments for restorative dentistry.

An important point that I think needs to be brought up has to do with unaccompanied children and the medicolegal aspects of releasing a child on their own without a parent or guardian to accompany them, even though they have been reversed with naloxone. We avoid this situation by simply not providing anything other than local anesthetic and nitrous oxide/oxygen for such patients. One should insist upon, and confirm that transportation will be provided postoperatively and that someone responsible is available during the appointment. We never release children on their own who have been sedated.

During the period from 7 March 1977 to 28 October 1980 we recorded 3861 cases utilizing the technique described and we have had no emergency situations occur during that time. During this period we administered naloxone to 26 patients and those were not under emergency conditions. They were for slightly groggy patients whom we just simply did not want to discharge in that condition. In all cases where naloxone was given the patients were aroused quickly.

In conlusion, we have found the alphaprodine-hydroxyzine combination described to be an effective regimen and look forward to having it back.

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