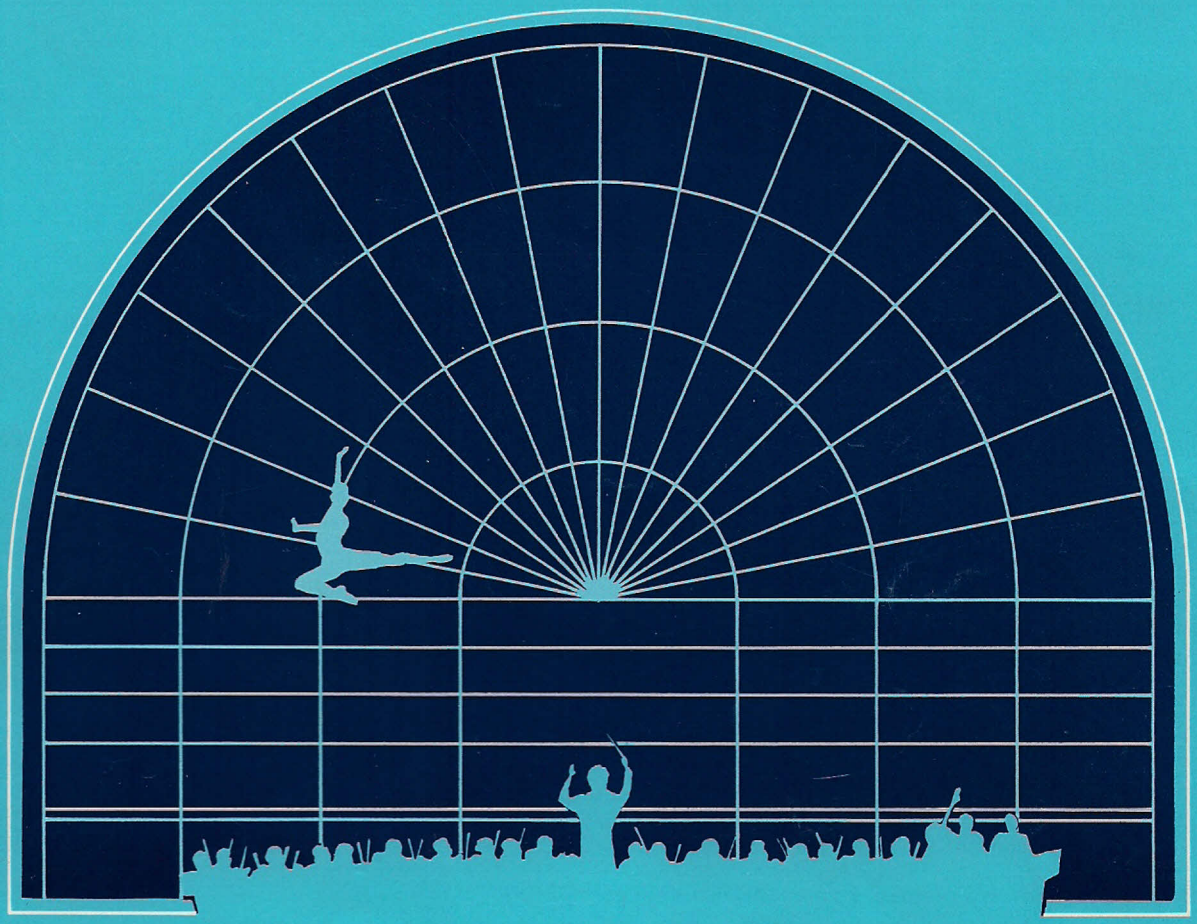

Medical Problems of Performing Artists

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Understanding the Procedures and Risks Involved in the Extraction of Third Molars

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Removal of third molars (wisdom teeth) is one of the most frequently performed oral surgery procedures. Brass or woodwind players dread the thought of having any teeth extracted, but wisdom teeth seem to be particularly notorious because of their reputation for pain and complications. This article is designed to present information regarding the procedures and risks involved in the extraction of third molars, especially as it pertains to wind instrumentalists.

Development of Third Molars

Wisdom teeth, which are the last adult teeth to erupt, usually do so between the ages of 17 and 23. Dentists number teeth beginning with the upper right going across to the upper left, from 1 to 16, and then from 17 to 32 on the lower left going across to the lower right. Therefore, the four wisdom teeth are properly numbered as follows: upper right third molar—tooth #1; upper left third molar—tooth #16; lower left third molar—tooth #17; and lower right third molar—tooth #32.

The best way to assess third molar development and evaluate the need for extraction is with an x-ray of the jaw in the third molar area. This is the point at which a regular dentist may recommend an oral surgeon. The x-rays taken by a general dentist (bitewings and periapical x-rays) are small films. While these are excellent for detecting cavities and for viewing the depth of decay in various teeth, they are not always adequate for detailing third molar development, since third molars often form further back in the mouth than the standard x-ray films can reach. This is especially true if the patient has an active "gag" reflex to the placement of bitewing x-rays. For this reason oral surgeons typically take panoramic x-rays. Panoramic films give a more complete view of the entire jaw and root structure for both upper and lower teeth, and this view is ideal in determining spatial relationships for surgical purposes. As third molars develop, it is advisable to have panoramic x-rays taken and examined by an oral surgeon, which is ideally done at approximately age 16.

When oral surgeons study panoramic x-rays with regard to third molar development and possible extraction, they are concerned about two crucial areas: the relationship of the lower third molars (nos. 17 and 32) to the mandibular nerve, and the proximity of upper molars (nos. 1 and 16) to the maxillary sinuses. If the sinus is perforated, it could create a direct opening between the sinus and the oral cavity. This will be discussed in detail later.

The mandibular nerve (also called the inferior alveolar nerve) is actually the third division of the trigeminal nerve, and provides sensory information to the mandible, the lower teeth, the posterior one-third of the tongue, and the lips and face. Therefore, damage to one of the mandibular nerves would cause loss of sensation to the corresponding side of the lower jaw to the midline, including the lower teeth, the posterior one-third of the tongue, and the lower lip to the midline of the same side. The proximity between root structures and the mandibular nerve is of obvious importance to a wind player evaluating the risks of extraction. If the roots of a third molar closely approximate the mandibular nerve, then extraction of the tooth could potentially impinge on the nerve, even to the point of completely severing the nerve. If sensory loss results, it can last for several weeks, several months, or in extreme cases, indefinitely, depending on the degree of trauma sustained by the nerve.

Extraction of Third Molars

The keys to minimizing the possibility of nerve damage appear to be early detection and extraction of third molars before root structures are fully formed. A recent clinical study of more than 9,500 patients by Drs. Osborn, Frederickson, Small and Torgerson (four Detroit-area oral and maxillofacial surgeons) found that the optimal time for third molar extraction is between the ages of 12 and 24. These doctors concluded that sensory loss was four times more

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Removal of wisdom teeth at an early age results in more rapid healing, which in turn avoids long delays in the resumption of normal practice routines for musicians.

prevalent among 25- to 35-year-olds than in 12- to 24-year-olds, and was an even greater risk after age 35. They further observed that the cause of this increased risk was directly related to the completion of root formation and its close proximity to the inferior alveolar nerve (mandibular nerve). The study also found that when paresthesia did occur, 55.3 percent of the patients who suffered from this condition had normal sensation within two months, and 78 percent recovered within three months. Twelve percent had persistent nerve dysfunction six months after surgery. Of the 16,127 mandibular third molar extractions done in this study, 16 percent were erupted, while 84 percent were impacted. The findings were summarized at the conclusion of an *American Association of Oral and Maxillofacial Surgeons Surgical Update*:

> . . . as patients become older there exists an increased chance of surgical morbidity with reference to nerve paresthesias and alveolar osteitis. Also indicated—as patients' age and teeth continue to develop and remain unerupted, the incidence of postoperative complications rise and become more significant and prolonged. The oral surgeons thus concluded that, if indicated, removal of third molars should be completed in the teenage years to decrease both operative and postoperative morbidity.
>
> Functional third molars should be retained and restored. Because this study indicated significantly fewer complications among younger age groups, one should evaluate patients for removal by the time skeletal growth is complete (16–18 years of age).
>
> A recent review of the literature shows that most paresthesias will resolve in one to two years if left alone.*

It should also be noted that removal of wisdom teeth at an early age results in more rapid healing, which in turn avoids long delays in the resumption of normal practice routines for musicians.

Example I. Figure 1 reveals how critical the proximity of fully formed root structures to the mandibular nerve can be. In this panoramic x-ray, the lower left third molar (#17) is fully impacted. The close proximity of #17 to the second molar (#18) would make the eruption of #17 virtually impossible. The roots of #17 are directly on top of the mandibular nerve. If this impacted third molar presses against the second molar (#18) as #17 tries to erupt, it could cause extensive pressure and subsequent pain. Infection and decay could result if an opening in the gum tissue developed between #17 and #18 which allowed saliva to "leak" along the length of #18's root surfaces. Pressure created from impacted teeth can cause overcrowding and irregularity of other teeth. Because of the relationship of root to nerve,

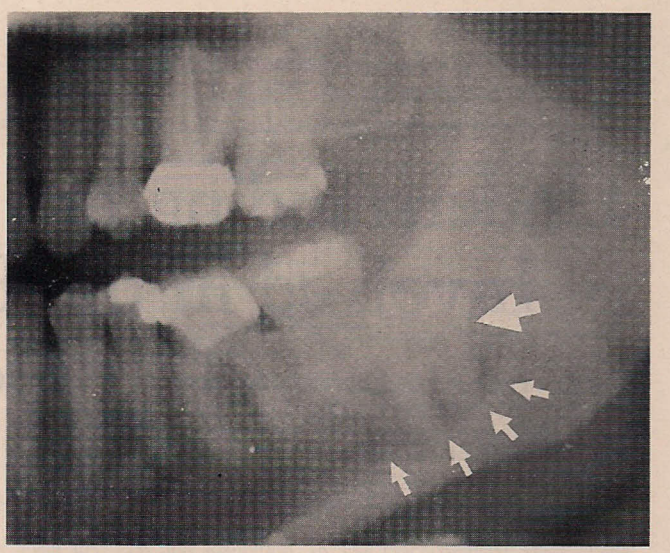

FIGURE 1 Fully impacted left third molar (#17) is indicated by large arrow. Smaller arrows follow the path of the mandibular nerve, revealing the close proximity of the nerve to the root structure of #17.

however, extraction in this instance could cause paresthesia. Had the third molar been removed before the root structure was fully formed, an easier and safer extraction with less chance of nerve damage would have been possible. This is an excellent argument for early detection of impaction and subsequent early extraction.

Example II. This case reveals a different set of concerns. Figure 2 shows x-ray views of the upper left third molar (#16) and the lower left third molar (#17). Both of these teeth are partially erupted, both are coming in straight, and both have room to erupt further. If it became necessary to extract these teeth at the time of this x-ray, potential problems are as follows:

The roots of the upper left third molar (#16) are in close proximity to the maxillary sinus, so that removal could risk

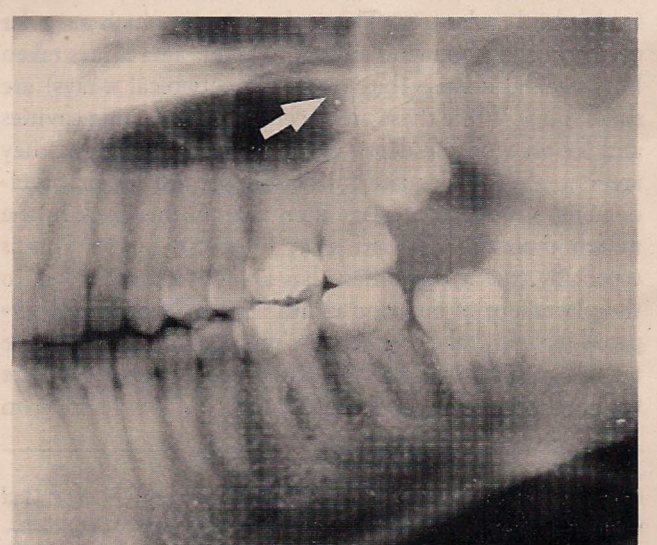

FIGURE 2 Upper left third molar (#16). Arrow shows the close proximity of the root structure of #16 to the maxillary sinus.

*American Association of Oral and Maxillofacial Surgeons Surgical Update. Volume 2, issue 2, Summer 1986, p 3.

sinus perforation. Complications of maxillary sinus rupture include oral-antral infection, chronic drainage, and subsequent sinus inflammation. Maxillary sinus rupture is treated in the following manner:

1. The socket is "packed" with resorbable sterile gelfoam to close the wound.
2. The defect is closed with multiple tight sutures (stitches).
3. The patient is advised to avoid "blowing his nose" for 10 to 14 days, or longer if necessary.
4. Penicillin (or an appropriate substitute) is prescribed.
5. For musicians, practicing brass or woodwind instruments should be discouraged for at least two to four weeks. The pressure created between the nasal and oral cavities when playing might delay healing or aggravate the wound.

The lower left third molar (#17) is in close proximity to the mandibular nerve. Even though the potential for problems is much less than in Example I, the patient should be aware of the relationship of tooth to nerve and of possible complications that may arise. This patient would very likely be advised to wait 1 to 1½ years to allow for any additional eruption to occur and then to have #16 and #17 extracted.

Example III. Figure 3 illustrates a different type of third molar impaction known as mesioangular impaction. Here the lower right third molar (#32) is impacted at a right angle to the adjacent teeth. Failure to extract this tooth could cause pressure against other teeth in the vicinity, creating swelling. The pain can be severe and often radiates to the ear, causing the entire side of the face to be very painful. Eventually this condition could endanger the alignment of the teeth on that side of the jaw. Possible paresthesia from nerve damage here is less likely than in Examples I and II because the roots are not in proximity to the mandibular nerve. However the incision necessary to remove this third molar will be longer than in the other examples. This may create more postoperative pain and carries a greater risk of infection. If #32 had been extracted when the root structure was less developed, or even nonexistent, the incision would have been shorter, and in turn the healing time would have been shorter.

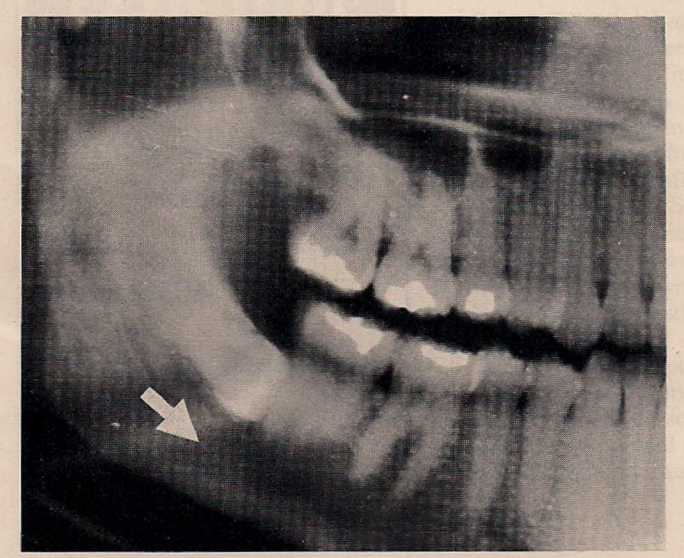

FIGURE 3 Lower right third molar (#32) is impacted at a right angle to the adjacent teeth. This is classified as a mesioangular impaction.

As we have seen, spatial relationships between teeth, bone, nerves, oral and nasal cavities, etc. often necessitate the extraction of wisdom teeth. Another condition, pericoronitis, involves the gumline and may also necessitate extraction. Pericoronitis usually occurs when a lower third molar does not erupt entirely through the gumline, while simultaneously the upper third molar erupts. This results in the "sandwiching" of gum tissue between opposing third molars and subsequent edema of the gumline to the extent that it interferes with occlusion. As a result, every time the patient occludes, he bites down on the gum, causing pain, further inflammation, and potential infection.

Decisions Before Surgery

When it is decided that a patient would benefit from the extraction of third molars, a decision must be made as to the type of anesthesia to be used. General anesthesia may be recommended if teeth are impacted because the procedure is often too traumatic for the patient to tolerate. It is also used for multiple extractions, again for trauma-related reasons. Whenever general anesthesia is used, it is almost universally recommended that all planned extractions be done at one time in order to minimize the number of exposures to the anesthetic. Most patients find that there is not much additional postoperative discomfort from multiple extractions as opposed to single extractions, especially if the teeth were impacted. If a local anesthetic such as Novocaine is used, patients often elect to have only right or left side third molars extracted at a time in order to lessen the anxiety level of consciously sitting through four extractions.

If only one third molar on a given side is removed, and the opposing molar is retained, the patient runs the risk of the remaining molar supraerupting (continuing to erupt beyond its normal range of occlusion). This takes place because the retained third molar has no antagonist during normal occlusion, and it is consequently free to continue erupting. Failure to extract the antagonist results in the remaining tooth occluding on opposing gum tissue, a situation similar to pericoronitis. For this reason dentists almost universally recommend extracting third molar antagonists.

Another area of concern, and one that may determine whether or not nerve or sinus membrane damage takes place, is the possibility of fracture of a third molar during surgery. Approximately one out of every three third molars breaks during extraction. This can be caused by abnormally hard bone, brittle teeth, or badly decayed teeth. If this occurs, the surgical digging that takes place in order to remove the remaining root structure can increase the risk of nerve damage, maxillary sinus membrane perforation, and overall tissue trauma. The earlier in the development of root structures that third molars are removed, the less

likely that breakage will occur. A clean extraction, with no breakage, rarely causes nerve or sinus complications.

Postsurgical Care

Once a nonimpacted extraction is completed, the patient will be asked to bite down on sterile gauze for 30 to 60 minutes to help create a clot and stop the bleeding. Normal amounts of food can be eaten, but the following should be avoided: spicy foods, alcoholic beverages, and sharp-edged foods such as pretzels, potato-chips, etc.

Several methods exist for keeping the wound clean and free of food particles. Although some doctors give patients water syringes, this is not the method of choice because of the potential of the jet-spray of water to dislodge the clot, creating a "dry socket" (discussed later). A better method is a solution of hydrogen-peroxide that is used to rinse the mouth three times a day after meals.

For many extractions, sutures are used to close the wound. Sutures are utilized in instances involving a "wide" socket, and are needed for surgical extraction when an incision is necessary along the gumline in order to gain access to the molar, as in a mesioangular extraction (Example III). Suturing promotes quicker healing and lessens the risk of infection and bleeding.

Dry socket, known medically as localized acute osteitis, occurs when the blood clot that forms in a wound socket breaks down and is dislodged, or when a poor blood supply to the wound exists, hindering the formation of a clot. These situations create a dry socket where raw bone and nerve endings are exposed, and is very painful. Treatment is palliative. A paste containing eugenol (clove oil extract), camphor, benzocaine, and other ingredients is placed onto sterile gauze. The gauze is then positioned into the socket with forceps and left in place. This is repeated daily for generally 5 to 10 days or until the condition resolves.

It is unrealistic to plan on playing a wind instrument immediately after oral surgery.

Planning for Surgery/Recovery

It is unrealistic to plan on playing a wind instrument immediately after oral surgery. Performances and pressure situations should be avoided entirely for several weeks after surgery. It is best to plan on having oral surgery done over an extended vacation so that recovery can occur without worry about a deadline or playing commitment. The decision to resume playing should be determined by common sense and by consulting with the oral surgeon. When practicing resumes, the musician would be wise to stop playing immediately if acute pain or bleeding affects the area of extraction.

As musical careers progress, they generally tend to get busier, and the stakes become even higher should serious problems arise. It is in a young musician's best interest (particularly students who show promise) to have panoramic x-rays taken between the ages of 16 and 18 by an oral surgeon and, if necessary, to have third molars removed at this time. This can alleviate the potential for complications when third molars are left to be dealt with later in life.

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