Pericoronitis, a chronic periodontal inflammatory disorder, most commonly involves partially or completely erupted mandibular third molars in patients 16 to 30 years of age. Symptoms usually include pain and swelling but can involve purulence, trismus, dysphagia, lymphadenopathy and fever. An individual episode of pericoronitis might last for several days, but recurrences are likely to occur after a 7- to 15-month remission. At present, the most effective treatment for pericoronitis is extraction of the involved tooth.

Previous studies have demonstrated that pericoronitis adversely affects quality of life (QoL), which can be enhanced by extraction of the involved teeth. However, not all pericoronitis patients choose to have their third molars removed; in one study, only 87% of patients with third molar pericoronitis had the affected teeth extracted. Tang et al from the University of North Carolina School of Dentistry assessed the demographic characteristics and availability of dental insurance as likely indicators for patients with mild pericoronitis to elect removal or retention of their third molars within 6 months subsequent to enrollment in the study. They also assessed how QoL issues influenced the decision for third molar removal in patients experiencing mild pericoronitis.

Enrolled in the study during a 6-year period were 113 patients with mild symptoms of pericoronitis. Most patients (79) eventually chose third molar removal, while 34 elected to retain their third molars for the entire study. Only 41% of the patients had dental insurance; more patients in the extraction group (47%) than in the retention group (29%) had dental insurance. The extraction group included a greater proportion of patients reporting negative QoL in the domains of having at least “a little trouble” opening their mouths and taking part in social life.

Conclusion
In a 2003 study, 78% of patients reported choosing removal surgery to avoid future problems. Clinicians should not conclude that only pain
symptoms will prompt the patient to have his or her third molars removed; they should consider informing patients about the effect of pericoronitis on QoL.


Implant-supported Overdentures in The Edentulous Jaw

Management of the completely edentulous jaw commonly includes conventional removable complete dentures, an approach that has functional inadequacies and psychosocial shortcomings. Use of osseointegrated dental implants for implant-supported overdentures has significantly improved treatment outcomes for edentulous patients in a reliable and cost-effective manner. Mandibular overdentures, retained and supported by either splinted or unsplinted attachments, are now a universally accepted therapeutic method (Figures 1 and 2).

Schimmel et al from the University of Geneva, Switzerland, conducted a systematic review and meta-analysis to compare immediately loaded implants with early- and conventional-loading protocols for 2-piece implants with rough-surfaced solid screws that were ≥3 mm in diameter. Of the 3142 articles identified, 58 met the inclusion criteria and were selected. A majority of studies advocated an initial insertion torque of ≥30 Ncm and implant stability quotient value of ≥60.

Conclusion

The tendency of the meta-analysis to show superior survival in early- and conventional-loading protocols may have been influenced by the quality of the documentation currently available. Successful osseointegration can be accomplished with immediate loading as long as micromovement is kept within recommended limits.


Medication-related Osteonecrosis Of the Jaw: A 2014 Update

A committee of the American Association of Oral and Maxillofacial Surgeons (AAOMS) has suggested replacing the term bisphosphonate-related osteonecrosis of the jaw (BRONJ) with medication-related osteonecrosis of the jaw (MRONJ) to accommodate the increasing number of osteonecrosis reports affecting the jaws and linked to other antiresorptive (e.g., denosumab) and antiangiogenic drugs. Ruggiero et al from Stony Brook School of Dental Medicine, New York, presented an updated position paper to provide the following:

1 Risk estimates of developing MRONJ
Comparisons of risks and benefits of medications related to osteonecrosis of the jaw (ONJ)

Guidance regarding a differential diagnosis and developing preventive and management strategies

Antiresorptive medications include intravenous bisphosphonates (e.g., zoledronate) used to treat cancer-related disorders, such as hypercalcemia of malignancy, bone metastases and multiple myeloma, with a mechanism that inhibits bone resorption and remodeling. Oral bisphosphonates are used to treat osteoporosis, osteopenia and Paget disease. Denosumab, another antiresorptive agent, inhibits osteoclastic action, which reduces the incidence of hip and vertebral fractures in osteoporotic patients. Angiogenesis inhibitors interrupt the formation of new blood vessels and are used to treat specific types of tumors, including gastrointestinal tumors and renal cell carcinomas.

ONJ occurs mainly within the confines of the alveolar bone of the maxilla and mandible. The increased remodeling rate in the jaws may clarify the differential predilection to ONJ when compared with other bones in the axial or appendicular skeleton.

MRONJ can be diagnosed provided the following features exist:

1. Current or previous treatment with antiresorptive or antiangiogenic agents
2. Exposed bone or bone that can be probed through an intraoral or extraoral fistula in the maxillofacial region and that has persisted for >8 weeks
3. No history of radiation therapy to the jaws or obvious metastatic diseases to the jaws

Medication-related MRONJ risk factors

The risk of ONJ among cancer patients exposed to zoledronate and denosumab ranges from 50× to 100× greater than in cancer patients treated with placebo.

The risk for ONJ among osteoporotic patients exposed to oral bisphosphonates was reported to be 0.1% but increased to 0.21% among patients with >4 years use. However, a recent federal study estimated that the prevalence of outpatient bisphosphonate therapy was 7 for every 100 osteoporosis patients.

Local risk factors

Dentoalveolar surgery is a significant risk factor for the development of MRONJ, with 52% to 61% of patients claiming tooth extraction as the precipitating event for MRONJ.

The mandible is a more common location of MRONJ (73%) than is the maxilla (22.5%).

Preventive strategies, prior to initiating antiresorptive medication for an extended time, including optimizing dental health and extracting teeth with poor prognoses, have been proposed as prudent. Table 1 summarizes staging and treatment strategies.

### Table 1. Staging and treatment strategies

<table>
<thead>
<tr>
<th>MRONJ staging</th>
<th>Treatment strategies</th>
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</thead>
<tbody>
<tr>
<td>At-risk: No apparent necrotic bone in patients who have been treated with either oral or intravenous bisphosphonates</td>
<td>No treatment indicated Patient education</td>
</tr>
<tr>
<td>Stage 0: No clinical evidence of necrotic bone, but nonspecific clinical findings, radiographic changes and symptoms</td>
<td>Systemic management including the use of pain medication and antibiotics</td>
</tr>
<tr>
<td>Stage 1: Exposed and necrotic bone or fistulas that probe to bone in patients who are asymptomatic and have no evidence of infection</td>
<td>Antibacterial mouth rinse Clinical follow-up on a quarterly basis Patient education and review of indications for continued bisphosphonate therapy</td>
</tr>
<tr>
<td>Stage 2: Exposed and necrotic bone or fistulas that probe to bone associated with infection as evidenced by pain and erythema in the region of the exposed bone with or without purulent drainage</td>
<td>Symptomatic treatment with oral antibiotics Oral antibacterial mouth rinse Pain control Debridement to relieve soft tissue irritation and infection control</td>
</tr>
<tr>
<td>Stage 3: Exposed and necrotic bone or a fistula that probes to bone in patients with pain, infection and ≥1 of the following: exposed and necrotic bone extending beyond the region of alveolar bone (i.e., inferior border and ramus in the mandible, maxillary sinus, and zygoma in the maxilla) resulting in pathologic fracture, extraoral fistula, oral antral or oral nasal communication, or osteolysis extending to the inferior border of the mandible or sinus floor</td>
<td>Antibacterial mouth rinse Antibiotic therapy and pain control Surgical debridement or resection for longer-term palliation of infection and pain</td>
</tr>
</tbody>
</table>
Regardless of the disease stage, mobile segments of bony sequestrum should be removed without exposing uninvolved bone. Extraction of symptomatic teeth within exposed necrotic bone should be considered because it is unlikely that extraction will exacerbate the established necrotic process.

**Conclusion**
The AAOMS position paper on MRONJ is meant to inform practitioners, but it is not intended to set any standards of care. Improved strategies for the prevention, risk reduction and treatment of MRONJ need to be further investigated so that more accurate judgments about risk, prognosis, treatment selection and outcome can be established for patients with MRONJ.


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**Success of Narrow-diameter Dental Implants**

Traditionally, dental implants with diameters ranging from 3.75 mm to 4.1 mm (standard-diameter implants) have been utilized clinically and have had scientifically substantiated, outstanding long-term results. But in situations with a narrow alveolar crest and minimal space between teeth, the use of standard-diameter implants may be limited. Prevailing literature suggests that at least 1 mm of residual bone needs to exist adjacent to the implant surface, which corresponds to a horizontal alveolar crest width of 6 mm for a standard implant. Additionally, studies suggest that a 3-mm interimplant distance is preferable to obtain satisfactory papillary fill.

The use of narrow-diameter implants (NDIs) would minimize the need for bone augmentation for implant placement and could address small interdental and interimplant spaces. However, there exist potential biomechanical risks linked to the use of NDIs, such as fatigue fracture due to decreased implant diameter. Resistance to fracture has been addressed by the use of an alloy made of titanium, aluminum and vanadium (Ti-Al-V) rather than commercially pure titanium. Development of a titanium–zirconium (TiZr) alloy with enhanced fatigue resistance and compatibility similar to commercially pure titanium is a recent advance. Klein MO, Schiegnitz E, Al-Nawas B. Systematic review on success of narrow-diameter dental implants. Int J Oral Maxillofac Implants 2014;29(suppl):43-54.

NDIs were classified into 3 groups:

**Category 1:** <3.00 mm (mini-implants); this group included primarily 1-piece implants

**Category 2:** 3.00 mm to 3.25 mm (single-tooth indications); this group included primarily 2-piece implants

**Category 3:** 3.30 mm to 3.50 mm (broader indications); this group included only 2-piece implants

Survival rates in category 1 ranged from 90.9% to 100%, while survival rates in category 2 ranged from 93.8% to 100%. Implant success rate was reported for 1 study (92.9%) in radiologic assessments, 24 months after dental implant insertion. Survival rates in category 3 ranged from 88.9% to 100%; success rates ranged from 91.4% to 97.6%.

A meta-analysis performed for category 3 NDIs revealed no statistically significant difference in implant survival compared with conventional implants.

**Conclusion**
Extensive documentation shows that category 3 NDIs perform as well as conventional implants in all indications. Limited documentation shows that category 1 and 2 implants can be used successfully under certain conditions.


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**In the next issue:**

- Removal of excess cement in implant-supported restorations
- Foreign-body reaction to biomaterials
- Transcervical migration of a broken dental needle
- Anti-infective preventive measures on biologic implant complications and implant loss

Do you or your staff have any questions or comments about Report on Oral Surgery? Please call or write our office. We would be happy to hear from you.

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