

poses of fee schedules and payment for care, which resulted in serious inequities. Admittedly, some of these problems have been addressed by corrective legislation, but the issue continues to plague us with every new governmental edict or legislative act that affects health care and in each instance has to be "headed off at the pass" by another extensive/expensive lobbying campaign with our legislators, state or federal.

To one of us (R.A.M.) who practiced initially as a DDS/OMS and then earned the MD degree and completed general surgery training, the difference was enlightening, particularly in my relationships with most physicians (not always with otolaryngologists or plastic surgeons, though) who now accepted me as one of them.⁶ However, the most important difference to both of us is that we are not necessarily better OMSs but better doctors. Our perspective on care for our patients has taken on a more global view, and we are now better able to perceive and assume more responsibility for our patients' overall medical needs, the primary reason for a basic medical education for all physicians.⁷ As OMSs/MDs, we were able to obtain additional training in microsurgery and oncologic and reconstructive surgery that we would not have been able to participate in with only a dental degree, and because of our general surgery training, we qualified as Fellows in the American College of Surgeons, which is not currently available to non-MD-OMSs (and probably never will be). If enough OMSs become Fellows in the American College of Surgeons, they will be able to form their own section within the college and gain official recognition and prestige among their fellow MD surgical specialists.

Third-party payers, be they private insurance, self-funded employer plans, or governmental programs, have had a pervasive influence on the scope of many OMSs' practices. Low reimbursements for orthognathic, temporomandibular joint, oncologic, cranio-maxillary, and reconstructive surgery have influenced many surgeons to exclude these areas from their practice, thus creating the dichotomy in oral and maxillofacial surgery between those who develop lucrative "dentoalveolar" practices and those who continue to perform a large volume of hospital-based surgery. There should be room in oral and maxillofacial surgery for those who practice the full surgical scope, as well as for those who wish to limit their practices to strictly office procedures (dentoalveolar and so on). Such is the case in medicine, where the same basic residency training is given to all within a given specialty, regardless of one's ultimate scope of practice. Fellowships also provide additional training for those who wish to subspecialize in a specific area. However, all medical/surgical specialists have a similar basic medical education (MD degree) that forms the foundation for all future training.

Should OMSs be satisfied with anything less?

The academic OMS might derive the greatest benefit from MD/OMS training. In the academic milieu, one's credentials seem to be more important in developing respect and rapport, whereas in private practice, personal relationships with fellow practitioners are the key to building a busy and successful practice. However, as surgeons who have experienced the academic arena and private practice, we believe the benefits of the MD degree, additional general surgery training, and medical licensure apply equally as well to both.

The editorial was revealing in its information about the wealth of published articles in the *Journal* by graduates of integrated MD-OMS programs; clearly, these people have much to offer our specialty. Concerning the oft-heard argu-

ment that the dually qualified OMS will seek training in another specialty and become an antagonist of oral and maxillofacial surgery a la Reed Dingman, most MD-OMSS remain with us. For those who have sought further training in another surgical specialty that might compete with oral and maxillofacial surgery, many if not most have retained their relationships with oral and maxillofacial surgery (2 fine examples that come to mind are Eric Dierks, DMD, MD, and Bryce Potter, DMD, MD, both of whom are trained in otolaryngology/head and neck surgery, as well as oral and maxillofacial surgery, but are Co-Directors of Fellowships for OMSs in Maxillofacial Trauma, Maxillofacial Oncology, and Reconstructive Surgery at Legacy Emmanuel Hospital, Portland, OR).

Our basic message to the powers that be in oral and maxillofacial surgery education is that the time has come to take 1 of 2 possible pathways: single-degree (DDS or DMD) or double-degree (DDS/DMD-MD) training. The continued ambiguity is sending mixed messages to dentists, physicians, insurance companies, governmental agencies, and our patients as to just what type of professional person we are. This question is already being answered by our current oral and maxillofacial surgery residents, as the trend over the past 20 years seems to be that more and more oral and maxillofacial surgery trainees are electing to earn their MDs and take general surgery training.⁸

Will the American Association of Oral and Maxillofacial Surgeons, American Board of Oral and Maxillofacial Surgery, and oral and maxillofacial surgery educators finally light the candle, or will they continue to "curse the darkness"?

ROGER A. MEYER, DDS, MS, MD
Smyrna, GA

SHAHROKH C. BAGHERI, DMD, MD
Atlanta, GA

References

1. Assael LA. The view from the third rail. *J Oral Maxillofac Surg* 68:713, 2010
2. Laskin DM: Oral surgery—A question of degree? *J Oral Surg* 30:86, 1972
3. Laskin DM: Building bridges. *J Oral Maxillofac Surg* 41:628, 1983
4. Hooley JR, Merrill RG: Letter to the editor. *J Oral Surg* 30:314, 1972
5. Dingman RO: Good judgment dictates the boundaries. *J Oral Surg* 9:338, 1951
6. Meyer RA: Degree or not degree [letter]. *J Oral Surg* 32:808, 1974
7. Guralnick WC: The combined oral surgery—MD program: The Harvard plan. *J Oral Surg* 31:271, 1973
8. Meyer RA: "Plus ça change, plus c'est la même chose" [letter]. *J Oral Maxillofac Surg* 65:2389, 2007

doi:10.1016/j.joms.2010.04.001

DENTAL EXTRACTIONS IN PATIENTS RECEIVING BISPHOSPHONATE THERAPY

To the Editor:—In their recent article, Lodi et al¹ proposed a protocol for the prevention of osteonecrosis of the jaws (ONJ) in patients receiving intravenous (IV) bisphosphonates (BP). The authors provided sufficient follow-up data to document null incidence of ONJ in 23 patients receiving IV BP following their extraction protocol. Importantly, the risk for ONJ in patients receiving

IV BP following routinely performed dental extractions has been reported to range from 16-fold² to 53-fold.³ The authors note that one cannot know the exact proportion of dental extractions performed on at-risk subjects that result in osteonecrotic lesions.¹ In this regard, we have recently published a longitudinal cohort study in cancer patients receiving IV BP.⁴ From the raw data of the latter study, it is possible to calculate the proportion noted by Lodi et al. Table 1 presents this information for the first time. In our cohort, 114 patients were subjected to dental extractions, which were routinely performed in private-practice settings in northern Greece. None of the patients had been diagnosed with ONJ at the time of dental extraction. There were 87 women and 27 men, with a mean age of 61.7 years (range 39-92 years). Prescription indication for IV BP were multiple myeloma (49 patients), metastatic breast cancer (63 patients), and metastatic prostate cancer (2 patients). BP treatment was zoledronate (71 patients), zoledronate followed by ibandronate (14 patients), pamidronate (17 patients), and pamidronate followed by zoledronate (12 patients). Of these 114 patients, 46 (40.4%) had a subsequent confirmed diagnosis of ONJ in a mean follow-up of 20.4 months (range 5-68 months). Thus, the proportion noted by Lodi et al is available to the readers of the journal (bold text in Table 1). A hypothetical comparison of the 2 cohorts, which had similar follow-up duration and dosing schemas,^{1,4} is presented in Table 2. From the amalgamation of these data, it is clear that the protocol proposed by Lodi et al demonstrates substantial efficacy.

It is noteworthy that the protocol by Lodi et al¹ includes elevation of a full-thickness mucoperiosteal flap. Implicit damage to periodontal tissues does not appear to predispose to ONJ development. This assumption, which is based on the observations by Lodi et al, is consistent with previously presented evidence that periodontal tissue condition is not associated with risk for ONJ.⁴ The fact that the procedures reported by Lodi et al have been performed by various oral surgery residents and students in the last year of dental school further intensifies this argument, given that

Table 1. DENTAL EXTRACTIONS PERFORMED IN A COHORT OF MULTIPLE MYELOMA, BREAST, AND PROSTATE CANCER PATIENTS TREATED WITH INTRAVENOUS ZOLEDRONATE, PAMIDRONATE, AND IBANDRONATE FROM THEAGENIO CANCER HOSPITAL (n = 1621)

	ONJ		Total
	No	Yes	
Dental extraction			
No			
n	1,473	34	1,507
% within extraction	97.7	2.3	100.0
Yes			
n	68	46	114
% within extraction	59.6	40.4	100.0
Total			
n	1,541	80	1,621
% within extraction	95.1	4.9	100.0

Abbreviation: ONJ, osteonecrosis of the jaw.
 Pearson χ^2 for dental extraction comparison, $P < .001$. Descriptive and analytical statistics describing the cohort have been published previously.⁴

Table 2. HYPOTHETICAL COMPARISON OF COHORTS

Cohort	ONJ		Total
	No	Yes	
Thessaloniki			
n	68	46	114
% within cohort	59.6	40.4	100.0
Milan			
n	23	0	23
% within cohort	100.0	0.0	100.0
Total			
n	91	46	137
% within city	66.4	33.6	100.0

Abbreviation: ONJ, osteonecrosis of the jaw.
 Pearson χ^2 for cohort comparison, $P < .001$. Thessaloniki, Greece, cohort (Theagenio Cancer Hospital): 114 cancer patients receiving intravenous bisphosphonates in whom dental extractions were performed in private-practice settings. Milan, Italy cohort (Università degli Studi di Milano): 23 patients receiving intravenous bisphosphonates in whom dental extractions were performed according to the study protocol of Lodi et al at a university dental clinic.¹

inexperienced surgeons would be expected to cause more injury to the periodontal tissues. The evidence presented by Lodi et al indicates the need for clinical trials on the preventive efficacy of surgical periodontal treatment with regard to ONJ. We have previously proposed that periodontal disease does not appear to be associated with a greater risk of ONJ provided that periodontal surgery is avoided.⁵ The latter assumption may need to be revised in view of the limited but substantial evidence presented by Lodi et al.¹

Finally, BP may not be the only category of bone antiresorptive drugs that is associated with ONJ. Preliminary data from randomized clinical trials suggest that denosumab, an investigational human monoclonal immunoglobulin G2 antibody that binds to the receptor activator of nuclear factor- κ B ligand (RANK-L) could also be associated with increased risk for ONJ development.⁶ Broad introduction of denosumab into clinical practice may lead to the recognition of denosumab-related ONJ. Therefore, further research to document interventions for the prevention of ONJ in patients receiving bone antiresorptive therapy who undergo oral surgery is warranted. Future randomized clinical trials would be ideal, although sample size and ethical considerations^{1,7} make the conduct of such trials complex. Until better evidence is presented, the protocol proposed by Lodi et al is a worthwhile approach.

ATHANASSIOS KYRGIDIS, MD, DDS, MSC
 GEORGIOS KOLOUTSOS, MD, DDS, MSC
 KONSTANTINOS VAHTSEVANOS, MD, DDS, PhD
 Thessaloniki, Greece

References

- Lodi G, Sardella A, Salis A, et al: Tooth extraction in patients taking intravenous bisphosphonates: A preventive protocol and case series. *J Oral Maxillofac Surg* 68:107, 2010
- Kyrgidis A, Vahtsevanos K, Koloutsos G, et al: Bisphosphonate related osteonecrosis of the jaws: Risk factors in breast cancer patients. A case-control study. *J Clin Oncol* 26:4634, 2008

3. Hoff AO, Toth BB, Altundag K, et al: Frequency and risk factors associated with osteonecrosis of the jaw in cancer patients treated with intravenous bisphosphonates. *J Bone Miner Res* 23:826, 2008
4. Vahtsevanos K, Kyrgidis A, Verrou E, et al: Longitudinal cohort study of risk factors in cancer patients of bisphosphonate-related osteonecrosis of the jaw. *J Clin Oncol* 27:5356, 2009
5. Kyrgidis A, Vahtsevanos K: Risk factors for bisphosphonate-related osteonecrosis of the jaws. *J Oral Maxillofac Surg* 67:2553, 2009
6. Kyrgidis A, Toulis KA: Denosumab related osteonecrosis of the jaws. *Osteoporos Int* 2010 (in press)
7. Kyrgidis A, Verrou E, Kitikidou K, et al: Reply to I Abraham. *J Clin Oncol* 28:145, 2010

doi:10.1016/j.joms.2010.01.028

In reply:—In their comment on our article published in the *Journal of Oral and Maxillofacial Surgery*, (*J Oral Maxillofac Surg* 68:107, 2010), Kyrgidis et al made some useful observations on important aspects of osteonecrosis of the jaw (ONJ) in patients receiving intravenous bisphosphonates (BP). In particular, using raw data from one of their studies, they suggest putative incidence of ONJ following dental extraction in the absence of preventive treatment to be greater than 40%. Kyrgidis et al state that the risk of ONJ in such patients can be up to 53-fold greater; however, we think that reliable figures will not be available until studies specifically aimed at this subject determine incidence rates from prospective follow-up of patients who receive intravenous BP and undergo tooth extraction. In fact, data from retrospective studies are clearly affected by bias. Those presented by Kyrgidis et al, for example, although among the best available, are based on patient interviews and thus lack important details, such as the number of multiple extractions and surgical procedures and whether there was antibacterial treatment. In addition, the low number of extractions in the group without ONJ (68 in 1,541 patients, with a mean age >60, who were likely to receive immunosuppressant therapy) seems to indicate some detection bias. A much sounder estimate, reported by the Greek colleagues, is the proportion of cases of ONJ preceded by dental extraction (57%), a figure gathered by interviewing subjects with the condition and thus less prone to missing particularly relevant details.¹

Another interesting point raised by Kyrgidis et al is the association between periodontal condition and ONJ. Our study showed that elevation of a full-thickness mucoperios-

teal flap does not represent a particular risk factor per se. However, we think it is important to stress that such a procedure was performed on tissue that underwent professional hygiene and was regularly treated with chlorhexidine mouthwash to minimize infection and inflammation in patients taking systemic antibiotics (amoxicillin). In addition, as correctly pointed out by Kyrgidis et al, surgical procedures in our study were performed by surgeons with varying degrees of experience. This might indicate that surgical trauma to periodontal tissue and alveolar mucosa is not a significant risk factor for ONJ when performed on healthy tissue, but periodontal disease may have a major role in ONJ onset, given that clinically and radiographically apparent periodontitis was the most common dental comorbidity in a large case series.²

We also agree with Kyrgidis et al that biological treatment drugs are potentially involved in ONJ, because other anti-angiogenic drugs in addition to denosumab (ie, bevacizumab and sunitinib) have been shown to increase the risk of ONJ in patients taking BP³ as well as in BP-free subjects.⁴

GIOVANNI LODI, DDS, PHD
 ANDREA SARDELLA, MD
 ANNALISA SALIS, DDS
 FEDERICA DEMAROSI, DDS, MD
 MARCO TAROZZI, DDS
 ANTONIO CARRASSI, MD
 UNITÀ DI MEDICINA E PATOLOGIA ORALE
 Milan, Italy

References

1. Kyrgidis A, Vahtsevanos K, Koloutsos G, et al: Bisphosphonate-related osteonecrosis of the jaws: A case-control study of risk factors in breast cancer patients. *J Clin Oncol* 26:4634, 2008
2. Marx RE, Sawatari Y, Fortin M, et al: Bisphosphonate-induced exposed bone (osteonecrosis/osteopetrosis) of the jaws: Risk factors, recognition, prevention, and treatment. *J Oral Maxillofac Surg* 63:1567, 2005
3. Christodoulou C, Pervena A, Klouvas G, et al: Combination of bisphosphonates and antiangiogenic factors induces osteonecrosis of the jaw more frequently than bisphosphonates alone. *Oncology* 76:209, 2009
4. Estilo CL, Fornier M, Farooki A, et al: Osteonecrosis of the jaw related to bevacizumab. *J Clin Oncol* 26:4037, 2008

doi:10.1016/j.joms.2010.02.035