Advanced Dental Education

Oral and Maxillofacial Radiologists: Career Trends and Specialty Board Certification Status

Andrew J. Pakchoian, DDS; Didem Dagdeviren, DDS, PhD; Jessica Kilham, MLIS; Mina Mahdian, DDS; Alan Lurie, DDS, PhD; Aditya Tadinada, BDS, MDS

Abstract: Oral and maxillofacial radiology is the newest specialty to be recognized by the American Dental Association, so knowledge about the parameters of this profession is in the early stages of development. The aim of this study was to understand the current distribution of oral and maxillofacial radiologists (OMFRs) in academia and private practice, the nature of their practice, and trends in their board certification status. An email describing the study’s purpose with a link to a survey was sent to “OradList,” a listserv that has a majority of OMFRs in the United States and Canada as members. Of the 205 respondents, 46% were female; the age distribution ranged from 25 to over 70 years; and 80% were working full-time. Among the respondents, 66% practiced in an academic setting, 20% in private practice, 8% in both private and academic settings, and 3% in the military. Only 37% of the respondents were board-certified. For OMFRs trained from 1965 to 2009, there was an increasing trend towards becoming board-certified, but a significant decrease occurred after 2009, dropping from 65% to 35% of those trained in those years.

Dr. Pakchoian and Dr. Dagdeviren contributed equally to this study. Dr. Pakchoian is an Oral and Maxillofacial Radiology Resident, Department of Oral Health and Diagnostic Sciences, University of Connecticut School of Dental Medicine; Dr. Dagdeviren is an Oral and Maxillofacial Radiology Resident, Department of Oral Health and Diagnostic Sciences, University of Connecticut School of Dental Medicine; Ms. Kilham is a Public Services Librarian, Edward and Barbara Netter Library, Quinnipiac University; Dr. Mahdian is an Oral and Maxillofacial Radiology Resident, Department of Oral Health and Diagnostic Sciences, University of Connecticut School of Dental Medicine; Dr. Lurie is Professor, Section of Oral and Maxillofacial Radiology, Department of Oral Health and Diagnostic Sciences, University of Connecticut School of Dental Medicine; and Dr. Tadinada is Assistant Professor, Section of Oral and Maxillofacial Radiology, Department of Oral Health and Diagnostic Sciences, University of Connecticut School of Dental Medicine. Direct correspondence to Dr. Aditya Tadinada, Section of Oral and Maxillofacial Radiology, Department of Oral Health and Diagnostic Sciences, University of Connecticut School of Dental Medicine, 263 Farmington Avenue, Farmington, CT 06030-1605; 860-680-7527; tadinada@uchc.edu.

Keywords: advanced dental education, oral and maxillofacial radiology, dental specialty, board certification

Submitted for publication 8/7/14; accepted 10/11/14

The discipline of oral and maxillofacial radiology was established through the contributions of many pioneers. A hundred years after William Röntgen’s discovery of the “New Kind of Ray,” a 1995 article by Drs. Olaf Langland and Robert Langlais described many individuals who have guided dental radiology to its current state. Brave researchers include Dr. Otto Walkhoff, who lay on the floor for 25 minutes to capture the first bitewing radiograph. Dr. William Rollins educated the world about radiation safety and founded the discipline of radiation health physics, while Dr. William Coolidge developed a “hot cathode tube” that would make x-ray units available to all dental practices. The role of oral and maxillofacial radiologists (OMFRs) as educators of future dentists can trace its roots to Dr. Howard Raper, who established the first course in dental radiography and was adamant that general practitioners should have this knowledge. By contrast, another pioneer, Dr. Charles Kells, argued that dental radiographic interpretation should be left in the hands of specialists. We owe our emergence as diagnosticians to Dr. Weston Price who said, “No part of the x-ray work requires truer skill than the interpretation of the negative or the positive it produces.”

In spite of these accomplishments, it would be 85 years after Röntgen’s discovery before oral and maxillofacial radiology would become recognized as a specialty by the American Dental Association (ADA). Both Drs. Raper and Kells were correct: as specialists, dental radiologists (as they were formerly called) should educate general dentists on interpretive techniques and support them when needed. Since the first meeting of the American Society of Dental
Radiographers in 1921, individuals in the dental profession have recognized the importance of having a specialty dedicated to the acquisition and interpretation of radiographs. Finally, on October 13, 1999, the ADA recognized oral and maxillofacial radiology as the ninth specialty of dentistry.

Initially, most OMFRs pursued careers in academia and were largely involved in teaching dental students and residents the art and science of radiology in the head and neck region specifically related to dentistry. Prior to 1999, one possible reason for not establishing private practices was the lack of recognition of the profession as a specialty. Since then, the introduction of three-dimensional imaging such as CT, MRI, ultrasound, and nuclear medicine and widespread use of cone beam computed tomography (CBCT) in dental practice have opened up new opportunities for private practice. Three-dimensional imaging for dental implant therapy performed by an OMFR or a dentist with adequate training and experience will result in appropriate interpretation of data leading to better patient care. The future of patient-centered care in which imaging technology is optimally utilized will rely heavily on trained and board-certified OMFRs who will guide imaging centers, referring doctors, and patients in the right direction, while strictly adhering to the principles of ALARA (As Low As Reasonably Achievable), which is gradually evolving into ALADA (As Low As Diagnostically Acceptable).

While there are general ideas about the distribution of OMFRs in academia and private practice and a sense of general trends in referral patterns, at this point to our knowledge there are no conclusive data that confirm this. Our aim for this study was to identify current trends and distribution of OMFRs in academia and private practice, the nature of their practices, the referral patterns to their practices, and their status as diplomates of their specialty board. Without data to confirm the location and nature of OMFR practice, it is difficult to effectively train and mentor the next generation of OMFRs. Understanding the trends in the field and especially the nature of practice and distribution in academic versus private practice can help in developing structured strategic plans for the future of the specialty.

Methods

The study received approval from the Institutional Review Board of the University of Connecticut Health Center’s Human Subjects Protection Office. A self-administered survey consisting of 15 questions was created using SurveyMonkey. In addition to collecting demographic data, the survey included questions regarding level of training, type of practice, location of practice, imaging modalities used, percentage of time devoted to specific activities, and level of career satisfaction. The complete survey when tested at the University of Connecticut took approximately two minutes to complete.

Participants in the study were sought via an email in September 2013 sent to “OradList,” a listserv that has most of the OMFRs in the United States and Canada as members. A link to the survey was included in the email along with a statement describing the purpose of the study. Respondents were informed that participation was voluntary and were also informed that completion and return of the survey indicated consent. The link was posted on the listserv three times at an interval of at least 15 days between each post. To ensure privacy and anonymity, no personal information was collected; instead, each respondent was assigned a random number. Data from the survey were compiled into an Excel spreadsheet and statistically analyzed.

Results

At the end of the participation date, a total of 205 responses had been received. Since a listserv was used to contact potential participants, it is not possible to calculate a precise response rate; however, the listserv managers report there are approximately 1,000 members of this listserv and that nearly all OMFRs in academia and private practice in the U.S. are listserv members.

Of the 205 respondents, 110 (54%) were males, and 95 (46%) were females. Respondents had a broad age distribution ranging from 25 to over 70 years, with the highest percentage (17%) being between 30 and 34 years of age (Figure 1). In the United States, most oral and maxillofacial radiology residency programs are 20-36 months and are often combined with a master’s degree or PhD. Of the 136 respondents who answered the question about their training, 7% had certificate training only, 27% had master’s training only, 32% had PhD training only, and 35% had varying combinations of a certificate, master’s degree, and PhD (Figure 2). Regarding their country of training, 53% had received their training in the United States or Canada, followed by Turkey (20%) and the United Kingdom (8%).

...
numbers dropped significantly after 2009, going from 65% to 35% (Figure 4).

Regarding the type of practice and employment status of practicing OMFRs, a majority of the respondents who answered the question (66%) reported practicing in an academic setting, with 20% in private practice, 8% in both private and academic, and 3% in the military (Figure 5). In addition, 80% of the respondents were working full-time. Regarding the percentage of time spent in specific activities,
most of the respondents reported splitting their time between interpreting and teaching, which is consistent with the academic nature of their employment and type of practice. Following teaching, interpreting, and research, the respondents reported spending time in administrative activities and participating in general dental care (Table 1). Regarding level of work satisfaction, 86% of the respondents reported being either very satisfied or satisfied; only 14% reported being not satisfied.

Discussion

Oral and maxillofacial radiology is the newest specialty to be recognized by the ADA. With every new specialty, there are initial challenges that need to be addressed. One of the key challenges is to ensure sustainability of the specialty and an equal distribution of the graduating specialists in academics and private practice. To ensure the specialty is in good standing, the ADA recommends that the specialty be evaluated every five to seven years.

The results of our study suggest that a majority of the current OMFR specialists are in academia and there is not yet a substantial number of these specialists in private practice. This tendency for graduates to go into academia raises a question about the viability and sustenance of the specialty in private practice. While there have been other specialties that have traditionally been required to be attached to a hospital or a teaching institution, oral and maxillofacial radiology has not yet made clear strides toward having an equal distribution between academics and private practice. A likely challenge to having a sustainable, stand-alone private practice is that the majority of private practice currently involves CBCT acquisition and interpretation. Although revised dental codes include CBCT acquisition and interpretation, most dental insurance companies do not yet cover these services, which makes routine reimbursements associated with CBCT difficult. Although this situation may vary from state to state, a challenge for obtaining privileges to interpret imaging studies involving trauma, cancer, and maxillofacial deformities appears to be tied to hospital and academic institutional appointments.

In medical radiology, a physician cannot own a piece of radiology equipment because of a defined

Figure 3. Percentage of respondents with board certification by decade of training, 1965-2013

Figure 4. Percentage of respondents with board certification by years of training: 2005-09 versus 2010-13

Figure 5. Respondents’ practice type
conflict of interest. However, in dentistry, CBCT machines are typically located in dental offices, and the decision to have the CBCT scans interpreted by a qualified OMFR is at the discretion of the dentist who is acquiring the scan; the process is not officially mandated. To provide patient-centered health care, evolving imaging technology must be taken into account to redefine standards of care, and a thorough interpretation of scans must be advocated. To accommodate this fundamental shift, more OMFRs may be necessary; this would open up new opportunities and make private practice a more viable and sustainable option.

Studies of other specialties might provide information useful to the development of oral and maxillofacial radiology. A survey of endodontic residents in the U.S. found that over 90% were interested in engaging in part-time teaching, but the majority wanted to devote only 1.5 days per week to teaching.11 The top three reasons for those respondents’ lack of interest in an educational career were low salary, education debt, and lack of interest in research. Orthodontic residents in the U.S. have also been found to strongly prefer private practice over academic careers.12 This pattern is slightly different for the oral surgery residents surveyed by Lanzon et al., who found that those female, non-European American residents interested in research tended to pursue academic careers.13 Our study found a significantly higher number of females in their 20s to 40s than in their 50s to 70s, which suggests that there has been a steady increase in the number of female OMFRs in the recent years. This finding is consistent with the changing gender balance in dental schools and among specialists.14,15

Table 1. Percentage of their time (weekly) survey respondents devoted to selected activities, by number reporting each percentage level

<table>
<thead>
<tr>
<th>Activity</th>
<th>&lt;10%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>28</td>
<td>17</td>
<td>26</td>
<td>23</td>
<td>17</td>
<td>25</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>152</td>
</tr>
<tr>
<td>Research</td>
<td>46</td>
<td>25</td>
<td>31</td>
<td>21</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>140</td>
</tr>
<tr>
<td>Interpreting</td>
<td>11</td>
<td>22</td>
<td>19</td>
<td>29</td>
<td>21</td>
<td>16</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>145</td>
</tr>
<tr>
<td>Administration</td>
<td>39</td>
<td>38</td>
<td>29</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>123</td>
</tr>
<tr>
<td>General dentistry</td>
<td>42</td>
<td>10</td>
<td>7</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>75</td>
</tr>
<tr>
<td>Other</td>
<td>24</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>51</td>
</tr>
</tbody>
</table>

A majority of the OMFRs in our study reported splitting their time among teaching, interpretation, research, and administrative responsibilities. Since a majority of these OMFRs were currently in academics, a significant amount of time spent in teaching and interpretation would be expected, but the study did not define the nature of interpretation: that is, if it was interpretation of two-dimensional images or advanced imaging. As more dental schools acquire advanced imaging equipment such as CBCTs, we expect there to be increased demand for qualified OMFRs to interpret the large volume of CBCT scans.

The results of our study indicate that the recent trend in training appears to have shifted in a clinical direction toward residency and/or a residency with a master’s degree. This indicates a transition from a heavily research-based specialty into one that combines research with clinical expertise. A key finding of this study is a low percentage of current board-certified OMFRs. While there was an overall increase in the number of diplomates from 1965 to 2013, the number decreased from 2009 to the present. A challenge we encountered in attempting to compare our findings with official numbers was that no relevant data were available from the American Board of Oral and Maxillofacial Radiology. Our survey did not ask the respondents without board certification if they had never sought certification or if they had failed; however, their low level of board certification could potentially impede their practice. Although our study found an unequal distribution between academic employment and private practice, the majority of the respondents reported being very satisfied with the nature of their job and its responsibilities.

Based on the relatively low number of OMFRs, our response rate of 153 was significant enough for us to report the findings of this survey; however, the lack of prior data for comparison is a potential limitation of our study. Our use of a listserv to reach possible participants also placed limitations on this study. We propose to do more detailed studies targeting OMFRs via additional methods in the future.
Conclusion

The results of this study suggest that a majority of the current OMFRs are in academia and there is not a substantial number in private practice. We also found an increasing number of women OMFRs than in the past. The survey found a low percentage of board-certified OMFRs, and this trend seems to have progressively worsened.

Disclosure

This article was written by LT Andrew J. Pakchoian, Dental Corps, United States Navy, in collaboration with the other authors, while a resident in oral and maxillofacial radiology at the University of Connecticut School of Dental Medicine. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, the Department of Defense, or the U.S. Government.

REFERENCES

15. Carlisle LD. The gender shift, the demographics of women in dentistry: what impact will it have? Spirit of Caring, June 18, 2014.