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Review article

Specialty education and scope of oral and maxillofacial surgery in the United States

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Abstract In the United States, Oral and Maxillofacial Surgery (OMS) is a specialty of dentistry that focuses on the management of injuries, diseases, and defects of the head, neck, face, and jaws. The present manuscript is an article on education and training of OMS residents in the United States. It a lso briefly describes the scope of practice of the specialty. The manuscript also sheds light upon the less practiced areas such as research and business administration aspects of the specialty. The authors also discuss gender and racial distribution of OMS residents. Descriptive information was obtained from the literature and official organization websites. Lastly, owing to the background and the arduous training required, OMS is a specialty of its own kind. It is a combination of both medical and dental sciences, with surgical and anesthesia training, and is unique in the field of medicine and dentistry. OMS play a unique role in the bridge between medicine and dentistry. Continuing education and advocacy in the hospitals, institutions, and society are crucial for increased awareness of the scope of OMS to further our specialty.

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Introduction

In the United States, Oral and Maxillofacial Surgery (OMS) is a specialty of dentistry that focuses on the management of injuries, diseases, and defects of the head, neck, face, and jaws. There are 99 OMS residency programs in the United States. Out of 99 programs, 55 are single degree (a four-year certificate) and 44 are dual degree (a six-year integrated residency and Doctor of Medicine) programs[1] (Table 1). OMS residency programs are fairly distributed in terms of the setting of operation, 44 being hospital based and 37 run out of dental school.[1] Small number of programs are medical school based (8) and federal service run (10) residencies[1] (Table 1). Regardless of the setting there remains a consistency of OMS training and education. Owing to the background and the arduous training required, OMS is a specialty of its own kind. The purpose of this article is to summarize the training and scope of practice of OMS in the United States.

Materials and methods

The present manuscript is an article on education and training of OMS residents in the United States. It also briefly describes the scope of practice of the specialty. The manuscript also sheds light upon the less practiced areas such as research and business administration aspects of the specialty. Lastly, the authors discuss gender and racial distribution of OMS residents. Descriptive information was obtained from the literature and official organization websites.

Results

Education

In the United States, oral and maxillofacial surgeons (OMS) are the surgical specialists who undergo extensive training that begins with dental school and continues with four to six years of hospital-based surgical residency. Following dental school, it is not uncommon for many students to complete atleast one year of non-categorical internship in OMS prior to securing a position into residency. Another important aspect of their application is the Comprehensive Basic Science Examination (CBSE) score. CBSE is a primary standardized examination for OMS residency programs.[2]

Table 1 Residency programs in the united states.

Number of programs (N = 99)	Setting of operation
55	Four-year certificate
44	Six-year integrated residency and doctor of medicine
44	Hospital based
37	Dental school based
8	Medical school based
10	Federal service based

Training

In training, an OMS resident gains vast experience in treating injuries, diseases, and defects of the oral cavity, jaws, head, neck, and face. Their education also includes formal and rigorous training in anesthesia. Furthermore, an OMS residents train alongside medical residents in general surgery, other surgical specialties such as plastic surgery and otolaryngology, and internal medicine. In the United States, two tracks for OMS training are offered: a four-year certificate program and a six-year integrated residency and Doctor of Medicine (MD) program. In the final year of training residents serve as the chief resident of the surgical service. In a six-year residency program, residents spend time in medical school, complete United States Medical Licensing Examination (USMLE), and their general surgery training toward eligibility for medical licensure. Regardless of four or six-year residency, the minimum amount of time spent by a resident on clinical OMS is 120 weeks (30 months), thereby training them in OMS equally. It is also important to note that all OMS programs are accredited by commission on dental accreditation (CODA).[3]

Core areas of OMS training include dentoalveolar surgery, implant surgery, soft and hard tissue augmentation procedures, maxillofacial trauma and reconstruction, corrective jaw surgery, management of benign pathology, odontogenic infections, and temporomandibular joint dysfunction. Furthermore, anesthesia training is the most important aspect of OMS education.

After residency, majority of OMS pursue board certification in the specialty and achieve Diplomate status with American Board or Oral and Maxillofacial Surgery. Board certification is a gold standard and requires successful completion of rigorous written and oral examinations. Some OMS pursue additional fellowship training to further their knowledge and surgical skills in a specific area of interest, such as head and neck oncology and microvascular surgery, cleft-craniofacial surgery, temporomandibular joint, or facial cosmetic surgery.[4] The American Board of Oral and Maxillofacial Surgery also offers two Certificates of Added Qualifications (CAQ) for Diplomates who demonstrate commitment to specific subspecialty of OMS, namely, Head and Neck Oncologic and Reconstructive Surgery and Pediatric Craniomaxillofacial Surgery.[5]

Scope of practice

The scope of practice of the OMS specialty is quite broad, comprising of corrective jaw surgery, reconstructive surgery after facial trauma, excision of benign cysts and tumors, surgical management of head and neck odontogenic infections, hard and soft tissue grafting procedures, dental implants placement, and dento-alveolar surgery. With extensive training in anesthesia, OMS are experts in providing general anesthesia/deep intravenous sedation.

Subsequent to the training, OMS have options to practice in private sector, academia, or both. Majority of them enter private practice, some choose a combination of academic career and private practice, and very few go into full time academia. After residency, most private practice surgeons transition into an office-based, dentoalveolar and dental

implant practice, limiting their scope. Only a minority of private practice surgeons incorporate a wider scope of practice beyond "teeth and titanium" at the hospital or an academic institution.[6] A survey study concerning the areas of OMS practiced in the United States revealed that dentoalveolar surgery and dental implants (90.1 %) are the most performed procedures.[7]

So why is there a discrepancy in the scope of practice? Why only very few surgeons practice the full scope of our specialty? There could be many reasons, ranging from financial considerations to lifestyle choices to institutional and hospital politics.[7,8] A few studies have evaluated the career choices dictating the scope of practice amongst OMS. A greater percentage of OMS residents with interest in private practice and working in dental service organization have reported significantly increased debts suggesting financial considerations are a key predictor of career choice.[8] Other factors that draw OMS to private practice are autonomy to make decisions, ownership, equity, and lifestyle choices.[9] On the other hand, residents who discover their passion for research and scholarly activities are more likely to pursue a career in academia.[10]

Fellowship training has expanded the scope of OMS practice to head and neck oncology, microvascular reconstruction, cleft-craniofacial surgery, and facial cosmetic surgery. A recent survey study noted that craniosynostosis (1.9 %) was the least commonly treated congenital anomaly by OMS. Similarly, rhytidectomy (3.1 %) and neck dissection (4.3 %) were the least commonly performed procedure.[7] Furthermore, according to the survey results, almost half of the fellowship trained OMS do not perform microvascular surgery. By virtue of hospital politics, OMS frequently compete with craniofacial trained plastic surgeons and otolaryngologists for cleft-craniofacial and head and neck oncology cases.[7]

On the other hand, OMS in private practice often compete with general dentist for dentoalveolar and dental implant surgeries. While there is an overlap in certain areas of care, it should be noted that the surgical and anesthesia scope of OMS is way beyond that of general dentists and any other dental specialist. OMS residents spend a minimum of 32 weeks on anesthesia and medical service, out of which 20 weeks are on anesthesia service. Four of these 20 weeks are dedicated to pediatric anesthesia. Furthermore, OMS resident functions as an anesthesia resident with comparable level of responsibility. Additionally, OMS residents continue to perform administration of general anesthesia/deep sedation throughout their residency under their faculty supervision.[3]

Research

Extremely small percentage of surgeons hold additional degrees including Doctor of Philosophy (PhD), Master of Science (MS), and Master of Public Health (MPH) and is not a part of OMS training. A study performed to assess the relationship between academic success and formal research training concluded that surgeons who have completed a formal research training have greater success with securing National Institutes of Health (NIH) funding.[11] However, formal research training did not appear to influence an OMS's academic rank. Additionally, formal research training may not be required to obtain grants from our own specialty foundations.[11]

Business administration

Very few surgeons pursue Master of Business Administration (MBA) degree. Like research related degrees, MBA is also not a part of OMS training. The MBA education allows surgeons to gain knowledge and expertise in the business and financial aspects of healthcare. Whether it is private practice or leading a department within a hospital or institution, skills pertaining to managing budgets and lean management are crucial for financial success. Currently, there is only one OMS residency program in the United States that offers an Executive MBA (EMBA) integrated with OMS certificate training.[12]

Gender and racial distribution of OMS residents

In the United States, gender parity in the dental school composition at the pre-doctoral level has reached with females comprising 53 % of dental students as of 2020; however, women continue to be underrepresented in this field representing only 21 % of OMS residents.[13,14] Research demonstrates that the reason for such low representation is multifactorial. Specialty interests evolve as dental students engage with current practitioners, understand the demands and lifestyle of each specialty, find mentors, and begin clinical work. A recent survey found that female students' less favorable educational experiences and attitudes toward resident and faculty role models correlated with their lower interest in pursuing OMS.[15]

As far as the racial distribution, during the 2018 to 2019 academic year, there were a total of 1208 OMS residents enrolled. Out of 1208 OMS residents 68.2 % residents were Caucasians; 18.5 % were Asian; 5.4 % were Hispanic; 3.1 % were African American; 0.7 % were Native Hawaiian/Pacific Islander; and 0.2 % were Native American/Alaska Native; and 3.9 % identified as 2 or more races or as nonresident alien, or unknown (Fig. 1).[16] A recent poster presentation also revealed that Hispanic residents along with women showed increase over time. The number of African American residents did not achieve higher than 1 % increase in the past few years.[17]

Discussion

The goal of a surgical residency program is to prepare the resident to care for our patients with competence, to work with other professionals and multidisciplinary teams crucial for the care of surgical patients, and to execute the role of a surgeon in private practice and academic centers at the level expected of a board-certified specialist, and to successfully pass the board certification process.

The residencies not only prepare trainees to be competent but also develop them into ethical and compassionate practitioners who learn to work with their colleagues in the field of dentistry, medicine, and surgery; and strive continuously for excellence, commit to life-long learning, and further their specialty.

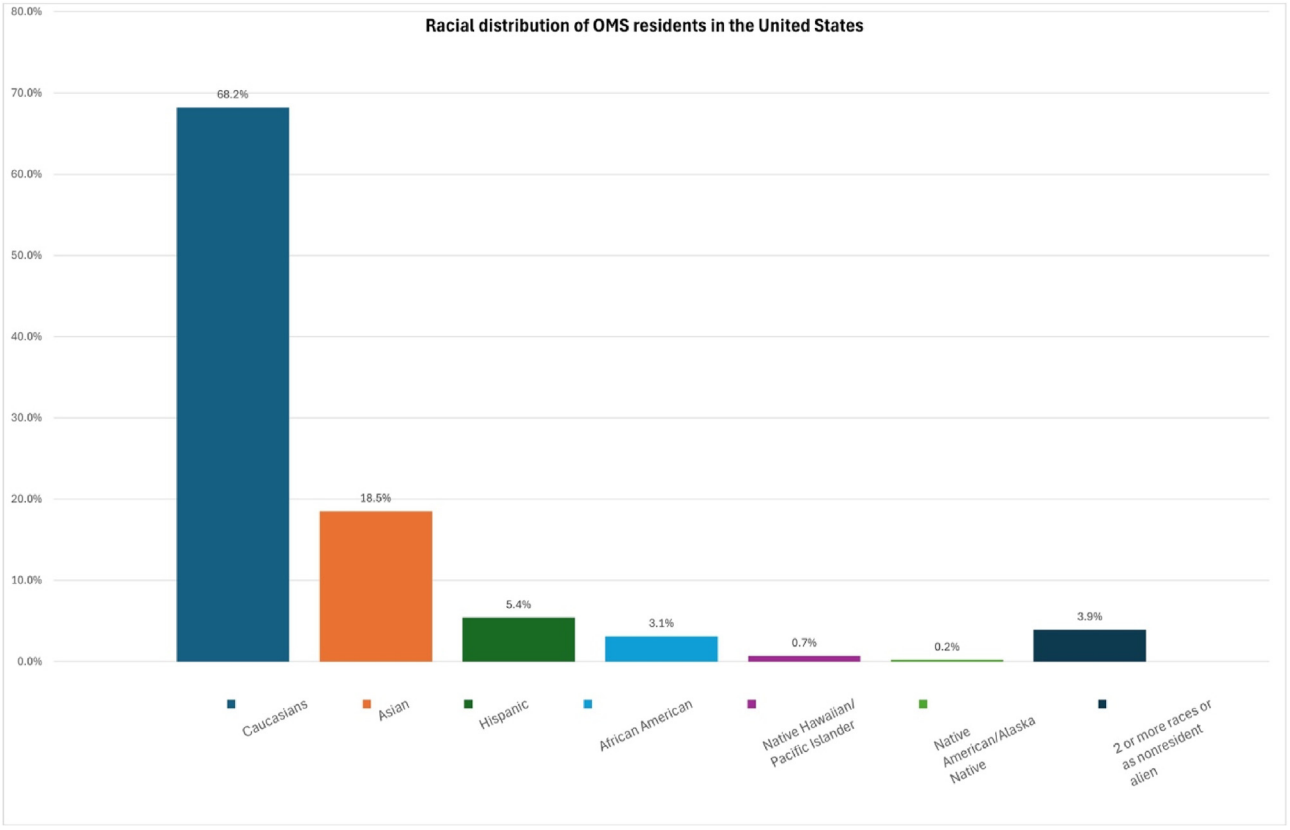

Figure 1 Racial distribution of oral and maxillofacial surgery (oms) residents in the united states.

OMS residents' training includes didactic instruction and clinical operative learning. Their education not only comprises of the acquisition of knowledge and skills, but also involves the application of knowledge into clinical scenarios and development of surgical judgement and acumen. The OMS residents are also provided with mentorship and opportunity for research, submission of a poster for presentation at an annual meeting, and a manuscript for publication.

Regardless of the geographic location of the program, there remains a consistency in the core OMS training across the United States. One of the major limitation of this manuscript is that it is not a study. It is a perspective article describing OMS training and scope of practice in the United States. The manuscript does not include statistics on the exact scope of practice of currently practicing surgeons across the country. Future studies on this topic will hopefully fill the gap on the extent to which each core area of OMS is practiced in the United States.

Owing to the background and the arduous training required, OMS is a specialty of its own kind. It is a combination of both medical and dental sciences, with surgical and anesthesia training, and is unique in the field of medicine and dentistry. OMS play a unique role in the bridge between medicine and dentistry. Continuing education and advocacy in the hospitals, institutions, and society are crucial for increased awareness of the scope of OMS to further our specialty. Furthermore, the gender and racial demographic distribution among OMS residents do not represent the growing gender and racial demographics of the United States. Development of initiatives aimed at improving diversity of the health care professionals is necessary to meet the needs of a diverse patient population.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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