Training Pathways in Oral and Maxillofacial Surgery Across the Globe—A Mini Review

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Abstract Due to historical reasons, many different training pathways exist across countries that lead to a degree in oral and maxillofacial surgery. Although it is generally accepted to be a specialty of dentistry, the complex nature of procedures being performed by OMF surgeons today, has necessitated extensive general surgical training. Many countries have thus made dual qualification mandatory, while others have extended training programs in OMFS with integrated medical teaching. In India, frequent contact with foreign experts, availability of world-class equipment and efforts of individual surgeons has ensured that the full scope of OMFS is practised in select centres of learning. However, the MDS curriculum dictated by DCI has not conformed to the requirements of the specialty as practiced today.

This brief mini-review of the various training pathways aims at comparing our system with other countries and attempts to draw lessons which could help improve future OMFS training in India.

Keywords Oral & Maxillofacial Surgery · Training · Master of Dental Surgery · Dual qualification

Introduction

The current scope of Oral & Maxillofacial Surgery (OMFS) includes complex cranio-maxillofacial procedures, which has necessitated extensive surgical training.

In many countries, this has resulted in the trainee compulsorily acquiring both medical and dental degrees before proceeding for higher training in OMFS. However, by no means dual degree is a uniform requirement to practice the full scope of OMFS in other parts of the world. Although dual training is undoubtedly beneficial for acquiring the requisite competence for practicing maxillofacial surgery, the necessity of a dual qualification remains debatable [1].

In 2008, Laskin reported that there exist 4 basic systems of education and training in OMFS around the world: [2]

- a. That requiring only a dental degree.
- b. That requiring both a dental and medical degree.
- c. That requiring a medical degree and no or minimal dental training.
- d. That requiring a combination of dental and medical education but not degree based (stomatology).

This paper reviews the training systems that are followed in various parts of the world and attempts to draw lessons, which could guide changes in curriculum of OMFS in our country.

a) Countries that Require Only a Dental Degree

Indian subcontinent

In India, the Dental Council of India regulates the curriculum for postgraduate course in OMFS. The revised MDS Course Regulations of 2007 has prescribed the duration of training to be for at least 3 academic years—the same as for other dental specialties. A candidate for admission to MDS course should possess a valid BDS degree or equivalent, which means that he/she should have completed 4 years of studies plus 1-year internship in a recognized dental college [3].

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In Pakistan, there are two systems of training of Oral and Maxillofacial Surgeons, both of which are of 4-year duration with similar admission criteria. Pakistan Medical and Dental Council recognize the MDS (OMFS) program conducted by some universities [4]. Parallely, The College of Physicians and Surgeons of Pakistan (CPSP) supervises accredited OMFS training programs in various dental colleges of the country for the FCPS in OMFS. The eligibility criteria for entering either the MDS or FCPS courses are that the candidate should have cleared BDS, completed 1-year house job and passed FCPS-I [5].

In Bangladesh, akin to Pakistani norms, the FCPS degree in OMFS requires 4 years of residency training and is awarded by Bangladesh College of Physician and Surgeons. It is considered the most prestigious specialized degree in OMFS at present. There is also MS degree in OMFS available from University of Dhaka [6].

In Sri Lanka, Post Graduate Institute of Medicine, affiliated to the University of Colombo conducts postgraduate degrees in medicine and dentistry. A Board of Study in Dental Surgery overlooks the dental postgraduate education including MD in OMFS. The eligibility criteria for entering into MD (OMFS) program require dental surgeons to possess 1 year of dental practice experience after graduation. The total duration of the program is 5 years which is divided into 3 years of pre-MD training and 2 years of post-MD training when the candidate has to compulsorily train abroad in maxillofacial surgery for 1 year followed by local training in an onco-surgical unit for 3 months and local training in OMFS Main Training Center for OMFS for 9 months. Board Certification is granted to the candidate on completion of training, i.e., 02 years after the date of MD (OMFS) Examination [7].

South-East Asia

In Malaysia, the OMFS program is a continuous 48-month course duration that prepares the graduate for the practice of OMFS. The candidates are awarded with Master of oral and maxillofacial surgery (MOMFSurg) upon the completion of this program. The eligibility criteria for entering into the training are to possess a bachelor's degree in Dentistry (BDS, DDS or an equivalent degree) and have at least 3-year post-registration experience in dentistry, in either Ministry of Health (MOH) or other institutions recognized by the University Senate [8].

East Asia

In Hong Kong, The College of Dental Surgeons of Hong Kong under the umbrella of the Hong Kong Academy of Medicine is responsible for the training pathway of OMFS

specialists, which includes a minimum of 6-year supervised training in recognized training centers [9]. It comprises of 3 years of basic training after the dental degree, followed by another 3 years of advanced training. There is an intermediate examination in between and an exit examination on finishing all the training [9].

In Japan, dental education is based on the odontological model, in which dental education is autonomous and separate from medical education. The dental curriculum is 6 years in length. Following this, doctoral program in OMFS can be undertaken at several dental schools, which last for 4 years or more [10].

Nordic Countries

In the Nordic countries consisting of Denmark, Sweden, Norway, Finland and Iceland, OMFS trainees do not require to have a medical degree in contradistinction with rest of Europe [11]. Helsinki University in Finland is the only university which advocates double diploma for a Specialist degree in OMFS [12]. Specialty training in OMFS is available in Sweden, Denmark, Finland and Norway, which is usually carried out in the hospital sectors attached to dental schools. Educational activities for specialists are regulated by the national health authorities, and the training programs vary from 4 to 6 years. With a double diploma, the education is 3.5 years. With a single dental degree or a single medical degree, the duration is 6 years, including additional medical or dental studies and healthcare center practice for 9 months [12, 13].

Turkey

In Turkey, the specialty is called “oral, dental and jaw surgery.” It is a dental-based specialty of which training programs take 4–5 years [14]. Halfway through the course trainees undertake a written-plus-oral examination to qualify for competency in theoretical knowledge. Currently, the OMFS training program in Turkey is in the process of being modified in an attempt to comply with the Medical and Dental Directives of the European Union. The new specialist program places more emphasis on formal basic surgical training with a total of 18-month rotation in various surgical specialties including plastic and reconstructive surgery, otolaryngology, general anesthesia, accident and emergency plus dermatology [14].

North America

Since 1970, there have been two routes that lead to certification by the American Board of oral and maxillofacial surgery (ABOMS): a 4-year certificate program, which

includes 1 year of medical training on off-service rotations and 4–6 months of anesthesia; and a 6-year training program that integrates completion of a medical degree, 4–6 months of anesthesia, and 1–2 years of general surgery residency [15]. The number of months spent on the OMFS service is typically 30–36 months in either program. Advanced training fellowships are available in head and neck oncologic surgery, reconstructive microvascular surgery, pediatric craniofacial surgery and cosmetic surgery [15].

Eligible applicants must be graduates from either pre-doctoral dental programs in the USA accredited by the Commission on Dental Accreditation (CODA); or pre-doctoral dental programs in Canada accredited by the Commission on Dental Accreditation of Canada; or International dental schools that provide equivalent educational background and standing as determined by the program [16].

Russia

The training path for maxillofacial surgery is open to both dentists and medical doctors, but it is not necessary to have dual degrees. A candidate who has obtained a diploma in General Medicine (6 years) can opt for a Certificate in Maxillofacial Surgery after 2 years of specialty training. Alternatively, candidates can take a diploma in Dentistry (5 years), then 1 year of internship and a Certificate in Maxillofacial Surgery after 2 years in training [17].

Africa

Not much is published on the training of maxillofacial surgeons in Africa. However, in Sudan, to qualify as an oral and maxillofacial surgeon, the requirement is to acquire a dental undergraduate degree (BDS) followed by a 4-year program in OMFS. The program consists of a hospital-based oral and maxillofacial surgical residency accredited by the Sudan Medical Specialization Board (SMSB) [18].

In South Africa, MChD in Maxillofacial and Oral Surgery is at least a 4-year program which is open to candidates who have obtained the BChD and/or MBChB degree or equivalent qualification at least 1 year previously and passed the Advanced Trauma Life Support Course [19]. In order to qualify for the degree in Maxillofacial and Oral Surgery, a candidate must hold a full-time registrarship for a minimum of 4 years (for a candidate with both a BChD degree and a MBChB degree), a minimum of 7 years (for a candidate with a BChD degree), a minimum of 6 years (for a candidate with a MBChB degree), or a minimum of 5 years [for MChD (ChirMaxFac-Dent)] [19].

Latin America and Middle East

In South and Central America (e.g., Brazil, Argentina) as well as Middle Eastern countries (e.g., Saudi Arabia, Egypt, Iran), only a dental license is sufficient to practice Oral Surgery [27]. There is considerable variation in both the length of clinical training and the scope of practice among the various nations, and in most centers limited types of surgery are performed [2, 14].

b) Countries that Require both a Dental and Medical Degree

UK

The majority of Consultants in OMFS in the UK qualify in dentistry before qualifying in medicine [20].

For those with a dental primary degree, training in OMFS in the UK takes approximately 18 years. Five years as a dental undergraduate is followed by 2 years of general dental training (Core Training 1) during which membership in dental surgery (MFDS) of one of the Royal Surgical Colleges is normally taken. This is followed by 3–5 years as a medical undergraduate, 2 years of medical foundation and 1–2 years of core surgical training (Core Training 2). A minimum of 12 months of core surgical training (CT2) and a pass in MRCS examination is required to progress to 5 years of specialty training as a specialist registrar. An exit FRCS(OMFS) examination is taken toward the completion of specialist training. This, together with successful RITA (Record of In-Training Assessment)/ARCP (Annual Review of Competence Progression) outcomes, allows the Specialist Registrar to be awarded a Certificate of Completion of Training (CCT) in OMFS and, therefore, be eligible for appointment as a Consultant in OMFS. A pre-CCT interface fellowship in esthetic, cleft lip and palate or head and neck surgery are an additional requirement [20, 21].

Northwest Europe

In mainland Europe, most of the countries now require a medical degree as well as a dental degree prior to qualification for further specialist training as a maxillofacial surgeon [2, 14, 18].

In Germany, only medical and dental graduates can apply for the OMFS program (trainees are called *Assistenzarzt* [male]/*Assistenzärztin* [female] or *Arzt in Weiterbildung*) [22]. After 6 years of medical studies and 5 years of dental studies, a candidate can gain the specialist competencies in the field of “oral and maxillofacial surgery” on completion of at least 2 years of basic continuing training,

followed by 3 years of specialist continuing surgical training. After completion of the 5 years, the “exit” examination is taken to become certified as a national medical specialist (called *Facharzt* [male]/*Fachärztin* [female]) [22]. The degree “*Facharzt für Mund-, Kiefer- und Gesichtschirurgie*” is awarded on completion of training [23].

Australia and New Zealand

Eligibility criteria for OMFS Training require the applicant to have completed a Dental degree as well as a Medical degree and full registration as a dental and medical practitioner in Australia or New Zealand [24, 25]. In addition, a full year of surgery in general (SIG) must be completed prior to the commencement of OMFS training. A minimum of 4 years of continuous training in accredited posts is required to obtain the Royal Australian College of Dental Surgeons’ Fellowship in oral and maxillofacial surgery [FRACDS(OMS)] [25].

c) Countries that Require a Medical Degree and No or Minimal Dental Training

France

In France, OMFS entitled “stomatology and maxillofacial surgery” is a specialty founded on a medical degree only and separated from dentistry (odontology) [22]. To obtain a degree in maxillofacial surgery and stomatology, a candidate should have completed 8 years of medical degree followed by 5 years of specialty training in OMFS. This includes training in general and trauma surgery for 1 year, in OMFS for 3 years, and in related surgical specialties (such as ENT, plastic surgery, vascular surgery, neurosurgery) for 2 years [22]. However, there is one common year in the courses of medical and OMFS reducing the number of years to twelve [26]. After training, the trainees must work as fellows (*chef de clinique assistant, CCA*) for 1–4 years in university or public hospitals. The first year of the OMFS fellowship in France is obligatory to obtain the official title of a maxillofacial surgeon [22]. In contrast to other European countries, French authorities do not require an oral and maxillofacial surgeon to have been a dental practitioner [27].

Spain

In Spain, the oral and maxillofacial surgeon does 5 years of specialty training after 6 years of medical studies [28]. Apparently, this is a different course from those taught in dental institutes, which is designated as Oral Surgery [29]. The qualification of specialist in OMFS (MD) in Spain is

obtained through the medical intern and resident (MIR) examination and a training system (as per Article 20 of Royal Decree-Act 44/2003) [30]. At present, there is no government plans to introduce the double degree [28].

d) Countries Requiring a Combination of Dental and Medical Education but Not Degree Based (Stomatology)

China

In China, the higher education system of stomatology is divided into three different levels, namely a 5-, 7- and 8-year undergraduate education system. The 5-year education system is based on general oral medicine lessons, and a Bachelor’s degree in oral medicine is granted at the students’ graduation. The 7-year education system is a long-term undergraduate education, and students of this system are trained as specialists (in areas such as OMFS) and are awarded the degree of Master of Stomatological Medicine (S.M.M) after graduation. The 8-year undergraduate education awards students the Doctor of Stomatological Medicine (S.M.D) at graduation [31].

Five-year undergraduates of stomatology can pursue the Master’s degree of OMFS (3 years, 5 + 3) after graduation, or get 3-year residency training (general oral medicine) at a general or stomatological hospital, which contain a department of OMFS. Oral and maxillofacial surgeons with a Master’s degree may continue into a PhD program (3 years, 5 + 3 + 3), which is mainly focused on scientific research. Therefore, oral and maxillofacial surgeons, in general, have graduated with: a Bachelor’s from the 5-year program; a Master’s from the 7-year program for Bachelor and Master Degrees in succession, or the 8-year program (5 + 3); a Doctorate from the 8-year program for Bachelor’s, Master’s and Doctorate Degrees in succession or the 11-year program (5 + 3 + 3) [31].

Training Opportunities Abroad for Indian OMFS

USA

Indian dental degrees are considered in the USA as degrees from non-accredited dental schools, and Indian dental graduates must sit for National Board Dental Examination (NBDE) examinations as the first step to acquire D.D.S/ D.M.D [32]. Several dental schools in the USA offer opportunities for foreign-trained dentists to acquire a full US dental degree (D.D.S/D.M.D) through abbreviated training [33].

Entrance requirements to the residency programs in OMFS may include such factors as scores on the NBDE Part I and/or Part II, Graduate Record Examination (GRE,

conducted by the Educational Testing Service), and TOEFL for non-native speakers of English, undergraduate grades/scores/grade point average, class ranking (if available), dean's letter, and letters of reference (usually from at least three individuals who are knowledgeable about the applicant's academic credentials, clinical work, research abilities, and long-term career goals and objectives) [33]. Though not an absolute requirement, it helps if applicants have experience in research, community activities, teaching, and leadership. Some US dental schools and residency programs also require that applicants be eligible for obtaining a full clinical license in order to pursue a clinical specialty residency program, while others require that applicants obtain a resident/limited license/permit [33].

UK

MDS in OMFS from India is not recognized in the UK as a postgraduate degree. However, as a dentist, one can get a temporary registration from GDC for the purpose of undertaking clinical work in a hospital as HO or SHO in OMFS [34]. Temporary registration is granted for a minimum of 84 days and a maximum of 365 days at a time and may be renewed by means of application, for up to a maximum of 1826 days (5 years) for permit-free training [34, 35]. Dentists from outside the EEA whose qualifications are not recognized for full registration with the GDC may take the overseas registration examination (ORE) before studying medicine. This allows one to do locum work as a dentist to pay one's way through medical school [36]. Some medical schools give exemptions for certain parts of the medical course to dentists who have MFDS. This leads to a shortened 3- to 4-year course [36].

The Royal College of Physicians and Surgeons of Glasgow conducted MFDS Part 2 examination in Chennai in January 2017 for the first time since 2011. This examination was open to all candidates who have successfully completed MFDS Part 1 within the last 5 years and have provided evidence of not less than 12-month postgraduate experience in dentistry [37].

Thus, the best way for a qualified overseas dentist to gain entry to a UK medical school would be to do some senior house officer jobs in the UK in OMFS, get MFDS, and obtain references from UK consultants [36].

Australia

Under Australian government regulations, overseas trained oral and maxillofacial surgeons (OTOMS) must undergo a specialist assessment process by Royal Australasian College of Dental Surgeons (RACDS) [38].

This assessment normally takes up to 3 months (from date of activation) to complete and involves a document-

based assessment and may include a face-to-face semi-structured panel interview [38].

The eligibility criteria for Specialist Assessment are that the candidate must possess a Dental degree and a Medical degree, which must be primary source verified, General registration as a dental practitioner in Australian or New Zealand and a Specialist qualification in the field of OMFS [38].

The Overseas Trained Specialist Working Group (OTSWG) assesses the application and interview report. Applicants who are deemed partially or substantially comparable to an Australian or New Zealand trained Oral and Maxillofacial Surgeon will be required to complete a minimum of 12 months of supervised clinical practice. An OTOMS must complete all requirements within 4 years of commencement, failing which his assessment validity period will expire and their assessment will no longer be valid [38].

Once all specialist recognition requirements have been completed within the required timeframe, the OTSWG will consider a recommendation that the applicant be granted Fellowship in the Specialty of OMFS (FRACDS(OMS)). This recommendation will go to the College Council for ratification [38].

Discussion

Controversy exists over whether dual medical and dental qualifications are necessary in order to practice the full scope of OMFS [2, 18]. Currently, training in OMFS, depending on where in the world one is, begins after dentistry, after medicine, or after both qualifications. The curriculum that is followed by various countries in their training programs varies in length, depth and quality leading to significant differences in professional standards worldwide [39].

In America, the first country to recognize Oral Surgery as a specialty, its dental roots are especially strong. Prior to WW1, Oral Surgery professors in American dental schools were largely dually qualified, but after the war, those with medical or dual qualifications dissociated themselves from singly qualified surgeons. In 1921, those with only a dental degree organized themselves into the American Society of Oral Surgeons and Exodontists, which was the forerunner of the American Association of Oral and Maxillofacial Surgeons (AAOMS) [40]. This body has been primarily responsible for ensuring that the training pathway for OMFS remains through dentistry. However, the need to incorporate adequate medical training has been recognized and the duration of the residency programs has been duly increased to either 4 or 6 years.

Oral Surgery in the UK too originated as the surgical specialty of dentistry, developing from the need for

specialist services to treat jaw injuries sustained by servicemen during the two world wars [20]. It soon became clear that the demand for treatment of an increasingly large range of pathological conditions of the face, jaws and teeth required extensive surgical training. As a result, dual qualification became mandatory in the late 1980's [20]. The requirement of basic general surgical training, assessed by a surgical Fellowship examination, was developed in conjunction with the Royal Surgical Colleges. The specialty, while retaining its dental base, was formally established as one of the nine surgical specialties in 1994 and has membership of the Senate of Surgery and its Committees [20]. However, it has been stated that apart from a training period lasting 18 long years, postgraduate training in both dentistry and surgery has led to a suffocating schedule of examinations and an intellectually stultifying syllabus for trainees [41].

In Europe, disparate systems of training exist with dual qualifications being the norm in certain countries while some have only medical or only dental degrees as the requirement for higher training in OMFS. Nevertheless, all countries recognize the need for extended surgical training and most residency programs last between 4 and 6 years.

It is interesting to note that “Oral Surgery” is recognized by European Union directives as a specialty of dentistry that deals with the diagnosis, surgery and co-adjutant treatment of the diseases, trauma and defects of the maxilla/mandible and adjacent areas [29]. In 1985, the Dental Education Consultative Committee approved the teaching programs in Oral Surgery run by many dental schools throughout Europe and the UK, which are generally of 1- to 2-year duration [29].

In 2001, the International Guidelines for Training and Education in OMFS stated that the actual surgical training in the oral and maxillofacial region was what qualified one to become an oral and maxillofacial surgeon in the country or region, regardless of whether one had dental and/or medical qualification [42].

In India, OMFS training ill prepares the trainee to practice the full scope of the specialty. The rotation in allied medical subjects during second year of training is grossly inadequate bordering on being farcical. Stand-alone dental colleges with attached 100-bedded hospitals usually have very poor infrastructure and manpower to provide general surgical training. Also, the spectrum of maxillofacial surgeries being performed in such centers is limited in scope for the same reasons. Recognizing this fact, in 2012, DCI notified that no permission would be granted to any dental institute to start MDS in OMFS unless attached to a Medical college [43]. However, the curriculum has not yet been modified to include an extended surgical training.

It is an unfortunate fact that while on the one hand, OMFS in India has taken ownership of several procedures that were traditionally with other surgical specialties such as cleft and craniofacial surgery, oral oncology and microvascular reconstruction; a majority of young OMFS are narrowing their scopes of work, staying within their offices and clinics, and performing lesser and lesser major procedures either due to economic reasons or due to a sense of inadequacy instilled by a faulty training system [42, 44].

It is generally agreed that dual qualifications followed by five plus long years of higher surgical training before one is independently allowed to practice are a luxury we can simply not afford in our country [45]. The economic costs involved in undergraduate education and inadequate financial compensations received during training preclude such a notion. However, for several years the Association Of Oral and Maxillofacial Surgeons Of India (AOMSI) has desperately tried to restructure the curriculum including the addition of another year to accommodate the extra needs [45]. These proposals have yet to see the light of the day. The suggestion to start an abbreviated MBBS course for dental graduates has also not been appreciated by the concerned authorities.

In 2013, an attempt was made to start M.D.Ch of 5½-year duration after BDS or 2 years after MDS in oral and maxillofacial surgery. This higher degree was supposedly aimed to address the demands of the specialty for enhanced general surgical training [46]. However, this move was opposed by members of AOMSI as there was a fear that the new degree would undermine the existing one.

A few opportunities are available to interested maxillofacial surgeons in India to enhance their skills. Candidates may apply for a limited number of structured post-qualification fellowships through AOMSI as well as through University and Institutional support [44]. Most of these are not formally recognized by the DCI but they maintain credible training records to certify a higher level of proficiency.

Board certification in OMFS is important as the specialty yearns for formal recognition and credibility as providers of surgical care [47]. This process not only assesses the quality of the candidate but also plays an important role in channeling education and training [47]. The Indian Board of Oral and Maxillofacial Surgery was constituted under the aegis of AOMSI for assessment of surgical knowledge and skills of young maxillofacial surgeons. Recently, even the International Board for the Certification of Specialist in oral and maxillofacial surgery (IBCSOMS) conducted its certification examination at Bangalore in 2016. Hopefully, if more and more youngsters become Board certified and opt for a future in academics, it would have a positive effect on the overall training standards in our country.

Conclusion

An analysis of training pathways for OMFS clearly demonstrates (1) the acceptance globally of the need to train our future surgeons in both dentistry and medicine and (2) irrespective of the basic qualification, residency programs in OMFS (as distinct from Oral Surgery courses) across the nations are at least 4 years.

Taking into consideration, the economic impact of extended training on a student who plans to practice office-based Oral Surgery vis-à-vis a trainee who aspires to be part of a broader hospital-based surgical specialty, a suggested way forward would be to bifurcate OMFS into two sub-specialties prospectively, similar to the European system:

- a. Oral Surgery, which continues to be a dental specialty of 3-year training to be taught in stand-alone dental colleges
- b. Oral and Maxillofacial Surgery (preferably registered with both the dental and medical councils), a longer duration program with integrated medical training to be conducted by dental colleges attached to medical institutes.

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