

Oral and maxillofacial surgery in Africa

Solomon Obiri-Yeboah and colleagues reflect on its practice, its modes of training and its future on the continent

Oral and maxillofacial surgery is a surgical specialty based in the medical and dental sciences, which manages a wide range of orofacial and head and neck pathologies. The scope of practice ranges from dentoalveolar procedures, maxillofacial trauma, head and neck oncology, salivary gland diseases, temporomandibular joint disorders, correction of cleft lip and palate and craniofacial surgery etc.^{1,2} In spite of its well-defined scope of work, it is not well known especially in Africa. The general public including health workers have little or no idea what this specialty entails.^{1,3-6}



cal Genetics, Clinical Oncology and Radiotherapy, Anaesthetics, Paediatrics, Orthopaedics, ENT, Intensive Care, Orthodontics, Restorative Dentistry and other Dental Specialties.¹⁰ The scope might differ from country to country and surgeon to surgeon due to availability of skill, equipment, instrumentation and technology.

Many are appraised of the scope of work of a dentist and other surgical specialists such as plastic surgeons, ortholaryngologist (ENT), ophthalmologist and neurosurgeons etc, but not that of oral and maxillofacial surgeons (OMFS) even though they share a common anatomical region of practice (head and neck region)(3) Apart from the scope of work, the nature of training of the OMFS is also poorly understood. There is still a debate on whether trainees should have a primary medical or dental degree or both; and the additional medical knowledge a dental graduate require; or how much dentistry a medical graduate should study in order to qualify as a Maxillofacial surgeon.⁷⁻⁹

This article aims to introduce the discipline of oral and maxillofacial surgery including the scope of practice, training and its future. It will hopefully help readers to broaden their knowledge and guide many medical and dental graduates who may be considering a choice of specialty.

Scope of work

The scope of work of the OMFS has evolved from dentoalveolar surgeries to involve more complex multidisciplinary surgical cases such as craniofacial trauma, head and neck oncology, temporomandibular joint diseases, dental implantology, orthognathic surgery, craniofacial surgery and facial aesthetics. The work of the OMFS has a strong relationship with a large number of medical and dental specialties; including Accident & Emergency, Neurosurgery & Neurosciences, Ophthalmology, Clini-

In Ghana, and most parts of Africa, the scope of work is generalised where the surgeon manages a wide range of conditions in the maxillofacial and head and neck regions. They deal mostly with dentoalveolar surgery, severe orofacial infections, facial trauma, jaw tumours, head and neck oncology, temporomandibular joint diseases, cleft lip and palate, and in recent times cranio-maillofacial surgery in certain areas.

A study in Ibadan, Nigeria showed that the scope of practice of oral and maxillofacial surgery is limited relative to what occurs globally. Traumatology, dentoalveolar surgery, and cleft repair surgery were frequent while facilities were less satisfactory for implantology and orthognathic surgery.¹¹

In the US, UK and South Africa, the practice of OMFS is quite broad; involving dentoalveolar surgery, dental implants, surgical correction of maxillofacial deformities, orthognathic surgery, cleft, and craniofacial surgery, maxillofacial trauma, temporo-mandibular joint surgery, pathological conditions, and reconstructive and cosmetic surgery.²

Modes of training

OMFS specialty training worldwide has always been on a pendulous track including purely dental or medical specialty models or integrating both basic degrees.¹⁶ Training may be university based leading to a higher Master or Doctoral degree as pertains in some parts of Europe and East Africa or Postgraduate Medical College based leading to professional Membership and Fellowship qualifications as pertains in several countries in West Africa, North America, and Australasia.

There are four basic models of education and training in oral and maxillofacial surgery: One that requires only a dental degree, one that requires both dental and medical degree, that requiring a medical degree and no or minimal dental training, and one that requires a combination of dental and medical education, but not degree-based i.e. stomatology.¹⁷

In the United States and Canada, all training pro-

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grammes are dentally based and, although some oral and maxillofacial surgeons also obtain a medical degree, most have only a Doctor of Dental Surgery (DDS) degree. However, they all achieve the same competencies and are able to have the same scope of practice.¹⁷

Formerly in the UK, the specialty was intensely dentally based, whereas on mainland Europe it was medically based. With increasing European integration, the UK has moved further towards the European model, requiring practitioners to have both dental and medical degrees.¹⁸ Even among the European countries the model varies.¹⁷

There are similarities in education and training among most of the Asian nations. All programs are dentally based and most also involve conducting research and obtaining a Ph.D. or MSc degree. The main exceptions are India, where only a dental degree is necessary, and China, which has the stomatology system. The practice of OMFS in these countries is no different from what occurs in the European nations that require a medical degree.¹⁷

In Ghana and other West African countries, a qualification in dentistry is enough to qualify for the training, after the trainee has successfully passed an entrance (primary) examination.²² The training is essentially a 6-year program which is divided into two; a three-year junior residency which will earn the trainee a Membership status followed by an additional three-year senior residency which will lead to the award of a Fellowship.¹⁸⁻²⁰

Regardless of the entry qualification, mode and pathway of training, it is essential that the graduate specialist oral and maxillofacial surgeon acquires the full range of competencies expected of him. It is important that more emphasis is placed on the content of the training programme, which should be competency-based, rather than on the degree required for entering the training

programme. Once qualified, individual practitioners may develop subspecialty interests within the scope of practice.

Future

Although there are many potential pathways for achieving standards of excellence in clinical care, sub specialisation provides one of the most appropriate ways of developing, promoting, and expanding a specialty.²¹ The way to grow the specialty in the developing world especially Africa, is for surgeons to go into sub-specialisation such as head and neck cancer, microvascular reconstruction, temporomandibular joint surgeries, cranio-maxillofacial trauma, craniofacial surgery, implantology, cosmetic facial surgery, etc.

The world is moving so fast with the advent of technology and Oral and maxillofacial surgery in Africa should embrace the new trends in the use of surgical technology and artificial intelligence for the care of patients. Some of these new surgical technologies include:

Digital planning and digital surgery

Today, a lot of surgical planning is done virtually or digitally before it is translated to the patient on the operating table. Digital surgery allows for careful categorisation of a patient and documentation of the surgical approach to the ensuing outcomes. It has the potential to democratise surgical technique and learning. It can illuminate new information and insights about the patient to inform critical decisions made during the procedure. It can improve outcomes by showing surgeons in advance the consequences and results of their choices made during the procedure. Eventually, digital surgery can restructure and improve competencies in the procedure, the preparation, and the recovery to allow even more patients to be treated.²²

Below are brief descriptions of digital technologies that can be used in Oral and Maxillofacial surgery.

3D virtual imaging

This is the use of software to create three-dimensional (3D) images and models to simulate the anatomy and the procedure before the surgery. The 3D planning provides information that can be easily provided in a sequence of images that can be manipulated by the computer. Computed tomography (CT) and, more recently, cone-beam computed tomography (CBCT) provide volumetric images of the anatomic structure of a patient's face. The data can be converted into 3D images of a patient's craniofacial skeleton and soft tissue coverings. It is also possible to interact with these 3D images simulating the surgery that will take place and provides information about the surgical outcome predictions in soft and hard tissues.²³

Navigation systems

The introduction of CAD/CAM software during surgical procedures provides the surgeon an opportunity to perform virtual manipulations of the CT datasets preoperatively. This includes repositioning of the patient into true orthogonal planes and mirroring of the facial skeleton as well as virtual osteotomies and bony reductions. CAD/CAM software programs have some utility in isolation but have limited clinical application unless some type of interactive tool is applied for use in the operating room. Intraoperative navigation provides this 'real-time' update. Real-time guided surgical navigation has led to the development of a navigable Temporo Mandibular Joint (TMJ) arthroscope with an integrated working channel. This arthroscope could help in avoiding complications during TMJ puncture, or give additional information during surgical treatment of high condyle fractures of the mandible.²⁵

Robotic surgery

Robotically-assisted surgery was developed to overcome the challenges of pre-existing minimally invasive surgical procedures and to improve the competencies of surgeons performing open surgery. The basis for the use of robotic surgery is to move the theory of precision and accuracy from industrialised processes towards medical purposes. A robotic surgery system has been established in several surgical specialties and lately has been developed for the resection of tumors in the oropharynx without the need for mandibulotomy by Transoral Robotic Surgery (TORS).²⁵

Conclusion

Oral and Maxillofacial surgery is a specialty with different pathways of training, any of which seeks to equip the surgeon with the basic knowledge and skills to operate within his/her limits of competence. The scope of work is wide and still evolving; especially with the advent of technology. The future for Africa is to move from 'Jack-of-all-Trades' type of specialty to sub-specialisation.

Last but not the least, research in the field of oral and maxillofacial surgery should be advanced to improve understanding and outcomes.

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