ORAL AND MAXILLOFACIAL RADIOLOGY IN LIBYA: A CALL FOR REFORM

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ABSTRACT:

Oral and Maxillofacial Radiology is the specialty of dentistry concerned with acquisition and interpretation of diagnostic imaging used for examining the dento-maxillofacial complex. It is recognized as a dental specialty in at least 40 countries, including Libya. This paper highlights the scope and standards of this relatively new specialty, and urges proactive steps toward the enhancement of Oral and Maxillofacial Radiology practice in Libya.

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تخصص أشعة الفم والوجه والفكين : دعوة للإصلاح

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أشعة الفم والوجه والفكين هو تخصص في طب الأسنان يعنى باقتناء وتفسير التصوير التشخيصي المستخدم لفحص الأسنان والفكين. و هو معترف به كتخصص في 40 بلدا على الأقل، بما في ذلك ليبيا. هذه الورقة تلقي الضوء على مجالات ومعايير هذا التخصص الحديث نسبيا، وتبحث على اتخاذ خطوات استباقية نحو تعزيز ممارسة تخصص أشعة الفم والوجه والفكين في ليبيا.

INTRODUCTION:

Oral and Maxillofacial Radiology (OMFR) is the specialty of dentistry and discipline of radiology concerned with the production and interpretation of images and data produced by all modalities of radiant energy that are used for the diagnosis and management of diseases, disorders and conditions of the oral and maxillofacial region. OMFR is a recognized dental specialty by the American Dental Association, Royal College of Dentists of Canada, Royal College of Radiologists (UK), and Royal Australasian College of Dental Surgeons. OMFR, as a dental specialty, is recognized in at least 40 countries; Libya is among them. OMFR has experienced a huge growth of knowledge and development of new technology in dentistry. Modern advances in imaging techniques have equipped dentists with state-of-the-art diagnostic modalities with a minimum of radiation exposure. Digital radiography, cone beam and multislice computed tomography, magnetic resonance imaging, and nuclear medicine imaging are presently part of the armamentarium of the dentist, via the route of oral and maxillofacial radiologists. Improvements in the understanding and diagnosis of disease have largely been credited to the specialty of OMFR. To maintain this progress for the advantage of our patients, dentistry will urge a constant supply of trained OMF radiologists.

ADVANCED IMAGING MODALITIES IN OMFR:

The first CBCT system became commercially available for dento-maxillofacial imaging in 2001 (New Tom QR DVT 9000; Quantitative Radiology, Verona, Italy). This advanced cross-sectional imaging technique is being increasingly used in dento-maxillofacial imaging to solve complex diagnostic and treatment-planning tasks encountered in implantology, orthodontics, endodontics, craniofacial fractures, and more. The availability of data in a three-dimensional format also has allowed the construction of surgical stents for guiding dental implant placement and for the creation of accurate implanted prostheses. The reported high spatial resolution, comparatively low radiation exposure, reduced costs, and the compact design afforded by CBCT technology have made it particularly attractive for exploring the sinonasal complex, petrous temporal bone, and skull base.

CT scan is useful for the diagnosis of and for determining the extent of a wide variety of infections, cysts, tumors, and trauma in the maxillofacial region. The ability of CT imaging to display fine osseous details makes it an optimal modality for lesions involving bone. MRI offers excellent soft tissue contrast resolution that makes it ideal for evaluating soft tissue conditions, for instance, the position and morphology of the articular meniscus in the TMJ, and determining nodal metastases and perineural tumor spreads. Ultrasonography is used in the head and neck region for evaluating adenomas in the thyroid, parathyroid or salivary glands, and the major vessels of the neck for atherosclerotic changes. Ultrasonography is also used to guide fine-needle aspiration in the neck. Radionuclide imaging (bone scintigraphy) uses radioactive molecules that emit gamma rays. Radionuclides allow measurement of tissue function and provide an early indicator of disease through measurement of biochemical change. In oral and maxillofacial imaging, nuclear medicine is used to assess abnormal growth activity in cases of condylar hyperplasia.

Hybrid PET/CT imaging allows fusing of the anatomic data of CT with the functional information of PET, offering improved localization of metabolic abnormalities and thus more accurate detection of malignant lesions in the head and neck. Recent reports show PET/CT imaging superior to CT and MR imaging in staging, monitoring, and surveillance of head and neck squamous cell carcinoma. There has been a growing interest in the use of PET/CT-guided IMRT (intensity-modulated radiotherapy) for tumor contouring, allowing for accurate delineation of target volume and sparing of normal tissues for effective radiation therapy, because of its ability to provide both anatomic and functional information.

ADVANCED EDUCATION IN OMFR IN USA:

As of the date, OMFR is one of nine dental specialties recognized by the American Dental Association (ADA). Postgraduate training programs are usually 2-3 years in length and culminating in a Clinical Certificate of Specialty Training and/or a Master of Science degree. Residents are eligible to challenge the American

Board of Oral and Maxillofacial Radiology Certification Examination upon successful Completion of the program. Some institutions offer a one-year fellowship/preceptor-ship programs designed for the general dentist who wishes to gain a scientific background and additional practical training in OMFR. Curricula in a typical program include comprehensive coursework in radiation physics, biology, and protection; and rigorous interpretation of conventional as well as advanced radiographic examinations including, but not limited to, conventional and computed tomography, MR imaging, ultrasonography, and nuclear medicine imaging. Trainees should receive a solid background in head and neck anatomy, clinical and microscopic pathology, oral medicine, and research methodology. Teaching assignments in undergraduate dental radiology courses are also required. Diagnosis of head and neck disease is further emphasized in hospital-based neuroradiology rotations.

OMFR AS A CAREER:

OMF radiologist provides the opportunity to teach, practice, and/or conduct research in all aspects of radiology. They are also responsible for establishing guidelines for radiographic selection criteria, radiation safety, and quality assurance. Academia is a quite fulfilling career for OMF radiologists. The demand for OMF radiologists in dental schools is growing, paralleling the increasing shortage in dental educators. As they provide a wide range of radiographic interpretative services beyond the scope of general dentists and other specialists. Some OMF radiologists have appointments at medical schools or in hospital radiology departments. Such an environment provides access to imaging modalities not normally available in dental settings, such as CT, MRI, and arthrography.

STATUS OF OMFR IN LIBYA:

Although OMFR is a recognized dental specialty since 1979, Oral Radiology courses are traditionally being taught in Libyan dental institutions as an integral part of Oral Diagnostic Sciences (which subdivided into Oral Medicine, Oral Diagnosis, and Oral Radiology). As oral imaging is an indispensable component of all dental specialties, reformation of OMFR

discipline would not only activate participation of this subject in the practice of interdisciplinary dentistry, but it also would ensure a steady supply of well-trained OMFR educators and practitioners for the benefit of the profession and our patients. So it is the time to move beyond the status of recognition. Here are some of the recommendations to renovate OMFR practice in Libyan dental institutions:

1. Address workforce issues for radiologists and technologists.
2. Establish appropriate selection criteria, radiation safety, and diagnostic image quality.
3. Continually reassess and enhance OMFR curricula.
4. Improve interdisciplinary practice by strengthening ties with other specialists including medical radiologists.
5. Tailor educational activities to meet the needs of OMF radiologists, dentists, and allied health professionals.
6. Support new OMFR training programs.
7. Evaluate new technologies and their applications.
8. Promote studies to measure the impact of standards on the quality of patient care.
9. Shape and advance the scientific base in OMFR by fostering research.

SUMMARY:

Recent literature reveals that CBCT has a cornerstone role in diagnosis and treatment planning for many dental disciplines. For optimal patient care, the CBCT image dataset must be entirely evaluated and reported by a trained OMF radiologist. Incidental pathology noted in CBCT scans acquired for other diagnostic purposes, is further investigated using other appropriate imaging modalities, in coordination with the referring doctors. Because of the global trends of general dentistry have altered specialty practice, and the increasing demands for dental specialty educators in academic as well as clinical settings, serious steps have to be made towards the rehabilitation of the OMFR system in Libya. I hope that this information will aid those who wish to pursue their career as OMF radiologists.

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