Current perspectives on oral surgery

How to improve consistency and implementation of contemporary treatment recommendations and options in general dental practice

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General dental practitioners are only required to undertake surgical treatment of teeth, tooth-like structures, and soft tissue surrounding teeth. In this regard, the UK General Dental Council defines “surgical dentistry” as “those surgical procedures within the mouth which would normally be accomplished for a cooperative patient under local anaesthesia, with or without sedation, in a tolerably short operating time.”

In the past 50 years, oral surgery has progressed significantly in the diagnosis and treatment of dental and jaw pathology. Dentistry, particularly surgical dentistry, is rapidly changing and evolving, and dentists worldwide are attempting to adapt to the revolutionary changes and new opportunities resulting from the globalisation of dental and medical surgical specialties. New insights and discoveries related to oral surgery are indeed astonishing and many of them have already been applied in everyday practice, and addressed in textbooks and at international congresses.

The near future will probably witness Er:YAG laser bone ablation replacing surgical drill osteotomy in oral surgical practice. Indeed, scanning electron microscope observations have determined that Er:YAG laser treatment produces well-defined edges, melting and carbonisation associated with carbon dioxide lasers observed on sites irradiated with Er:YAG lasers. In addition, FTIR spectroscopy revealed that the chemical composition of bone surfaces after ablation with an Er:YAG laser was almost the same as that after conventional drilling with a bur, proving that the use of Er:YAG laser ablation can be an alternative to traditional bur ablation in oral and periodontal oseous surgeries, particularly in mandibular ramus onlay block harvesting, apicoectomy, cyst and benign jaw tumour surgery, or the irradiation of bisphosphonate-associated jaw osteonecrosis.

Dental pulp stem cells (DPSCs) can now be cryopreserved and stored for years, while still retaining their multipotency and bone-producing capacity. These highly specialised cells show very low mortality and are easy to collect from extracted wisdom teeth or buds, for example. They also interact with bone biomaterials and substitutes, which makes them an ideal cell population for jaw reconstruction. In addition, stromal bone-producing DPSCs can be harvested from patients, while normal stem cell subpopulations of DPSCs are capable of differentiating into osteoblasts, and they are claimed to possess immune privilege and exert anti-inflammatory abilities like many other mesenchymal stem cells.

Introduced in the late 1990s, CBCT is becoming the main imaging armamentarium of oral surgeries, as it provides more and comprehensive anatomical information and data that help to improve preoperative and peroperative clinical implementation. CBCT can be used for diagnosis and intended removal of benign jaw tumours, and placement of dental implants.

While oral surgery continues to develop further with new technologies and visions, the assessment and diagnosis of patients will still form the cornerstone of any surgical specialty. Decision-making, a complex cognitive process that involves consideration of surgical patients’ complaints and preferences, the availability of evidence-based data, as well as practitioners’ case-specific clinical judgement, consequently remains an ongoing challenge for oral surgeons and dental general practitioners alike.

One of the most promising approaches is probably the non-surgical medical treatment of tumours and lesions of the jaws, as reported by Marx and Norn in 2003. They found a 65 per cent rate of complete resolution of central giant cell granulomas (CGCGs) in the jaws through intra-lesional corticosteroid injections. Due to their low recurrence, these lesions are currently one of the most popular intra-lesional steroids, and weekly injections with these are common practice for CGCGs. However, solitary jawbone lesions of Langerhans cell histiocytosis, a proliferative disease of the macrophage/dendritic cell lineage, are known to counterparly host osteolytic activity and increase calcium influx in bones. In this regard, salmon calcitonin, which is used in postmenopausal osteoporosis, hyperparathyroidism, Paget’s disease, and bone metastases, is considered to be a good option. Calcitonin is used to be more active than human calcitonin and to be an important tool in the medical treatment of jaw tumours. The main question is whether intraosseous calcitonin is as effective as subcutaneous human calcitonin in the medical treatment of CGCGs of the jaws.

Finally yet importantly, many clinicians and clinical investigators believe that the radical treatment of ameloblastomas, odontogenic tumours well known for aggressive growth and high recurrence after conservative treatment. For these reasons, en bloc resection is often implemented, which includes a resection of at least 1–2 cm of normal sound jawbone beyond the tumour’s margins. Such a radical surgical procedure is unacceptable in children with growing jaws though because segmental resection often leads to jaw deformity and dysfunction, which in turn may hamper physical growth and the mental well-being of the child/adolescent.

At the very least, conservative treatment of an ameloblastoma, especially in children, is necessary. The growth of the jaw is finally complete by the age of 18–20 years. Considering that the majority of ameloblastomas in children are unicystic and have a very low rate of recurrence, they can be managed by enucleation, a conservative form of surgical treatment.

A complete list of references is available from the publisher.