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Letter to the Editor

Rethinking the scope of oral medicine/oral surgery practice: 7 unusual must-know conditions for the oral surgeon

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"What we see depends mainly on what we look for."
John Lubbock (1834–1913)
British naturalist

Dear Editor,

With the advent of the new French residency cursus in Oral Medicine and Oral Surgery, common to both dental and medical students, there have been numerous – sometimes heated – arguments regarding the scope of practice of these newly trained surgeons. Such a complex issue requires taking into account the legal, ethical, professional and educational aspects of Oral Surgery practice in France [1].

As academic oral surgeons and educators, it behooves us to think those latter aspects so as to provide the best training for tomorrow's oral surgeons and the patients that will come under their care.

Despite the seemingly limiting title of the French residency cursus ("*DES de chirurgie orale*"), it is evident that French oral surgeons are also (*or at least should be*) Oral Medicine specialists (as suggests the French bylaw of October 18, 2017 [2] legislating the training of oral surgeons). This is of paramount importance, as oral surgeons are – by definition – the oral cavity specialists, trained to treat both dental and medical diseases affecting this region (especially considering the unfortunate lack of significant focus on oral diseases in other relevant medical specialties). Furthermore, Oral Medicine and Oral Surgery are *two sides of the same coin*, the former being often the indication for the latter.

When training our residents in Oral Medicine, we must provide them with the opportunity to train in the various subspecialties of the field such as Oral and Maxillofacial Pathology, Oral Mucosal Disorders ("Oral Dermatology"), Orofacial Radiology or Orofacial Pain. Fortunately, most French academic centers provide such training opportunities.

Nevertheless, in our experience, several specific conditions – that should fall in the scope of the oral surgeon's expertise – are often ignored, owing to the lack of cases in the various centers or to the attending surgeons' lack of experience with these conditions.

Hereafter are presented 7 examples of what we believe to be must-know conditions for the oral surgeon, irrespective of disease prevalence and incidence.

Post-stroke facial pain

Facial pain is an often-puzzling symptom, requiring thorough investigations to rule out severe morbid conditions. Of such conditions, post-stroke cerebral ischemia/infarction affecting the trigeminal nucleus or pathways can cause chronic central neuropathic pain often perceived as a continuous midfacial [3] or hemifacial burning sensations in the ipsilateral jaws, gums and tongue (unpublished observations). Other possible presentations include painful paroxysms in the eyes, nose or face [4,5] sometimes mimicking atypical trigeminal neuralgia [6]. Patients presenting the aforementioned symptoms should thus be explored by a neurologist and have a brain MRI prescribed. Painful sequelae of irreversible brain ischemia (central post-stroke pain) should be treated in adherence with the relevant EFNS guidelines for neuropathic pain management [7].

Coronary syndrome-related orofacial pain

Anatomical convergence of vagal/sympathetic cardiac and trigeminal afferents is responsible for referred pain during acute coronary syndromes [8]. In approximately 10% of cases, the referred pain can be solely located in the craniofacial region [9] often associated with subsequent diagnostic errors and lack of adequate cardiological care. The relevant cases reported in the medical literature are summarized in Table I.

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Table I. Reported cases of coronary syndrome-related orofacial pain.

Authors	Sex	Age	Orofacial symptoms	Symptom duration	Pain location	Cardiological diagnosis
Tzukert *et al.* (1981) [10]	F	56	Paroxysmal pain (and dyspnea)	NS	Bilateral anterior maxilla	Angina pectoris
	M	79	Severe continuous pain and thoracic pain	12 h	Maxilla and mandible	Infero-lateral myocardial infarction
	M	67	Paroxysmal pain upon walking	NS	Bilateral mandible	Angina pectoris
Graham & Schinbeckler (1982) [11]	F	41	Tooth pain followed by diaphoresis and retrosternal constrictive pain (and left arm referred pain)	1 h	Mandible	Myocardial infarction
Dalband *et al.* (2011) [12]	M	48	Sharp bilateral TMJ pain following physical activity or anger	4 months	Bilateral TMJs	Angina pectoris
Turner *et al.* (2013) [13]	F	59	Sensation of "teeth falling out" during physical activity only	7 months	Bilateral upper and lower teeth	Angina pectoris
Lopez-Lopez *et al.* (2012) [14]	8 F 22 M	48 to 78	Paroxymal ($n = 8$) or continuous ($n = 3$) pain	Several hours to 14 days	Bilateral mandible	8 myocardial infarctions 3 angina pectoris
Lopez-Lopez *et al.* (2012) [9]	5 F 4 M	63 to 79 56 to 76	Spontaneous severe pain ($n = 9$) and effort-induced pain ($n = 2$)	NS	Maxilla, mandible, cranium, zygoma, neck, temple, teeth	3 myocardial infarctions 6 angina pectoris
Fazlyab *et al.* (2015) [8]	F	60	Dull constringing sensation Pain exacerbated by stress and anxiety	2 weeks	Left hemiface	Angina pectoris followed by myocardial infarction

TMJ = Temporomandibular joint; NS = Not specified.

From a semiological perspective, acute coronary syndrome must be considered as a possible etiology for unexplained orofacial pain in the following circumstances:
- pain described as "unusual discomfort", "oppressing", "burning" or "pressure";
- bilateral pain;
- pain exacerbated by physical activity, stress, anxiety or anger and alleviated by rest and/or nitroglycerin;
- pain accompanied by neurovegetative symptoms such as nausea, vomiting, diaphoresis or dyspnea.

Immediate cardiology referral must be sought to manage such cardiac-mediated orofacial pain.

Cervical artery dissections following dental procedures

Cervical artery dissection occurs when the internal lining of the artery ruptures, often secondary to minor cervical/facial trauma, but also following iatrogenic events including dental procedures. Depending on the location of the cleavage, the dissection can be sub-intimal (resulting in artery stenosis) or sub-adventitial (resulting in arterial aneurysm).

Carotid artery dissections will often present with peri-ocular, temporal and neck pain, accompanied by ipsilateral Claude Bernard Horner syndrome. Ipsilateral hypoglossal nerve palsy is also possible, especially in sub-adventitial dissections (due to pressure from the aneurysm on the hypoglossal nerve as it runs in close proximity to the artery).

As carotid (and vertebral) artery dissections have been described following dental procedures, the oral surgeon must be knowledgeable of this rare but morbid complication. Reported cases of iatrogenic cervical artery dissection following dental procedures are summarized in Table II. Furthermore, carotid artery dissections have been also described as a complication of Eagle syndrome [22,23]. As such, contrast-enhanced CT images should be obtained in the routine evaluation of patients with elongated styloid processes (*i.e.* longer than 4 cm) to rule out carotid artery impingement (that could lead to an arterial dissection).

In cases where cervical artery dissection is suspected, immediate neurological referral is quintessential to prevent eventual cerebral infarction in the relevant vascular territory.

Trigemino-cardiac reflex

The trigemino-cardiac reflex is a sudden onset of parasympathetic dysrhythmia including hypotension, apnea and gastric hypermobility during the stimulation of any branch of the trigeminal nerve [24], which can in severe cases lead to

Table II. Reported cases of iatrogenic cervical artery dissections following dental procedures.

Authors	Sex	Age	Artery	Cerebral infarction	Dental procedure	Dissection risk factors
Prabhakar *et al.* (2001) [15]	M	31	Left VA	Left cerebellum infarct	Tooth avulsion (45 min)	NS
Cerrato *et al.* (2004) [16]	F	47	Left ICA	Left parieto-occipital infarct	Lower wisdom teeth avulsion	None
Shobha *et al.* (2010) [17]	M	63	Left VA	Left cerebellum infarct (PICA)	Tooth filling	Neck rotation and hyperextension (1h30)
De Santis *et al.* (2012) [18]	F	33	Left ICA	No	Inferior alveolar nerve block	None
Aghaebrahim *et al.* (2013) [19]	F	40	Bilateral ICA	Left parietal infarct	Avulsion of 27 teeth under general anesthesia	2 h of neck hyperextension
Molad *et al.* (2016) [20]	F	49	Bilateral ICA and Right VA	Bilateral parieto-occipital infarct	Molar removal and tooth filling under general anesthesia (3 h)	None
	M	61	Right VA	Yes	Tooth filling (30 min)	High blood pressure
	M	52	Left ICA	Yes	Tooth fillings (1h30)	None
	M	57	Left ICA	Yes	Gingival graft (30 min)	None
Narula *et al.* (2018) [21]	F	58	Right ICA	No	Local periapical anesthesia of tooth 14	High blood pressure

ICA = Internal carotid artery; NS = Not specified; VA = Vertebral artery.

syncope or even asystole and death. Trigemino-cardiac reflex is mostly observed during major oral and maxillofacial surgery procedures but has also been reported in tooth avulsion surgery [25,26] or even during root canal treatments [27]. The existence of such reflex advocates for proper preoperative local anesthesia to limit unwanted trigeminal afferent stimulation, even for procedures undertaken under general anesthesia [28].

Oral manifestations of vitamin deficiencies

Although skin and mucosal alterations are classic signs of vitamin deficiencies (especially group B vitamins such as vitamin B9 and B12) there have been few reports detailing the precise oral manifestations of such deficiencies and the underlying pathophysiology [29]. In our experience, B9 and B12 deficiencies can account for multiple oral manifestations such as angular cheilitis, atrophic glossitis, dysgueusia, mucosal erythema, ulcerations, intraoral paresthesias and burning mouth syndrome. In our practice, B group vitamin dosages are part of the systematic screening performed in unexplained burning mouth syndrome (glossodynia and/or stomatodynia) with or without objective mucosal alterations, dysgueusia or paresthesia.

Interestingly, B9 deficiency is an under-recognized cause of nutritional deficiency-related neuropathic pain [30], most probably resulting from methionine deficiency-related demyelination (methionine synthesis requiring vitamin B9) and activation of TRPV1 receptors responsible for the development of a superficial burning sensation [31].

In relevant clinical situations (anorexia, recent episodes of major emesis, recent change in diet, vegetarianism/veganism, etc.), possible vitamin deficiency should be considered when faced with unexplained mucosal and/or neurological symptoms.

Dysgueusias

Abnormal taste perception is an infrequent complaint with often-underestimated consequences such as decreased appetite, decreased food intake and impaired quality of life related to the hedonistic and social aspects of food intake.

Clinically, dysgueusia can present as qualitative or quantitative alterations in taste perception. Quantitative alterations are represented by hypo- and hypergueusia affecting either one or all gustatory modalities. Qualitative alterations can be secondary to distortion of taste perception (such as cacogueusia [unpleasant taste when eating pleasant food] or torquegueusia [metallic taste]) or to taste perception in the absent of any food intake (fantogueusia) [32].

Most dysgueusias are iatrogenic (drug-related, post-surgical injury to the chorda tympani, radiation-induced taste bud destruction, etc.) but can also occur in neurological disorders (Parkinson's disease), nutritional deficiencies (zinc, B9) or local tongue diseases (candidiasis, xerostomia).

Pure facial cephalalgias

As headache pain is mediated *via* trigeminal afferents (especially the ophthalmic branch, but also the maxillary and mandibular branches), primary headache disorders such as migraine, tension-type headache or cluster headache can manifest solely in the maxillo-facial region [33]. Such painful

syndromes will have all the relevant diagnostic criteria (as described in the International Classification for Headache Disorders 3rd edition [34]) albeit presenting in an unusual location.

For instance, in our practice, six patients with typical migraine without aura (ICHD-3 1.1) complained of unilateral jaw and tooth pain, with side-shifting in several patients (unpublished observations). Oral surgeons (and general dental practitioners) should be knowledgeable of such atypical presentations of primary headaches so as to avoid the frequent iatrogenic treatments (root canal treatments, tooth avulsions) these patients unfortunately undergo.

Oral surgeons are trained specialists that practice in a secondary or tertiary care setting. As such, general practitioners (medical or dental) rely on their expertise for unusual, complex cases or cases they believe to be out of their scope of practice. It is thus essential that the future oral surgeons be trained thoroughly to limit the risk of diagnostic error, wandering and subsequent morbidity.

These 7 vignettes illustrate often-unknown clinical situations for which every oral surgeon should be knowledgeable if not familiar.

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