Letters to the Editor

Dental general anaesthesia (DGA) dilemma; an interdisciplinary approach and thorough treatment planning

I have read with great interest the article by Jennifer Lawson *et al*,[1] which emphasizes the importance of comprehensive pre-operative treatment planning for dental care under general anaesthetic. A more radical treatment-planning approach, combining primary, secondary care and medical considerations, is vitally important to avoid the second and subsequent dental general anaesthesia (DGA).[2] Dentists who make referrals for DGA have to be confident that they have considered, and in some instances tried, alternative methods of treatment. This is particularly important in young patients and children who need DGA. Considering the fact that, currently, general dental practitioners are able to provide safe sedation alternatives for children and special needs adults, there is no doubt that DGA should be avoided, when possible.[3] Intranasal sedation, combined nitrous oxide and sevoflurane or ketamine and midazolam conscious sedation techniques[4,5,6] bring a new operational approach for our profession, instead of the DGA which involves the highest risk of potential complications.

Referring dentists ought to remember that DGA can be combined with other medical procedures,[2] if required, for instance: percutaneous endoscopic gastrostomy (PEG) tube placement/replacement in a patient with a learning disability; botulinum toxin A (Botox) injection for muscle spasms as a result of, for example, cerebral palsy; grommet-related procedures in children with acute ear infections or rhinoplasty. In patients with severe learning disabilities, DGA can also be considered in combination with periodical vaccination, a basic blood sample check, minor skin lesion removal, bone marrow biopsy, MRI/CT scan and/or other biopsy. Moreover, simple exodontia or conservative dental care under DGA can be potentially 'synchronized' at the same time with other dental procedures, essential for patient wellbeing and vitally important from the medical point of view, such as for cleft lip and palate operations, orthognatic surgery due to severe malocclusion, or operculectomy due to recurrent pericoronitis.

The implementation of a 'three-stages' approach for DGA assessment in children would be an ideal scenario, allowing a definite treatment plan and reducing the risk of general anaesthesia in future. This involves primary dental assessment carried out by a general dental practitioner, a second re-assessment performed by the dentist to whom referral was sent, and the third re-examination on the day of elective treatment, just before the general anaesthesia session. A standard rule of DGA has to be applied reflecting the ultimate recommendation: 'all teeth with a poor long-term prognosis have to be added to the treatment plan in order to prevent a second DGA in future'.

The non-invasive techniques which are widely available for dental practitioners and dedicated to caries detection seem to be helpful in making a validated decision during the pre-DGA assessment as the undiagnosed dental problems and lack of radiological assessment contribute to the repeated DGA. These include the use of trans-illumination, diagnostic intra-oral cameras facilitating caries visualization, and the latest innovations based on laser technology, such as quantitative light-induced fluorescence (QLF) and *DIAGNOcam*[7] or *CariVu*. The caries diagnosis might be more accurately achieved with a combination of visual inspection and the use of other methods.[8] These devices might support dental planning of dental care in children and patients who are unable to tolerate standard radiographs due to young age, fear or disability.

A lateral oblique (bimolar) technique may be of diagnostic value for DGA treatment planning and this can be performed by a primary care dentist with the use of a standard dental x-ray machine and dedicated cassette/film/phosphor plate. This technique should be considered where the DGA patient is unable to tolerate/co-operate sufficiently for the taking of intra-oral radiographs or an OPT scan, especially in children who are unable to remain still due to disability such as involuntary tremors or muscles spasms. For oblique lateral radiographs, young patients may receive a lower radiation dose due to shorter exposure time compared with rotational OPT.[9]

In summary, efficient communication with medical professionals and thorough long-term treatment planning might reduce the episodes of DGA in young patients who require advanced dental care.

References

1. Lawson J, Owen J, Deery C. How to minimize repeat dental general anaesthetics. *Dent Update* 2017; **44**: 387–395.
2. Dziedzic A. The role of general anaesthesia in special care and paediatric dentistry; inclusion criteria, consent and clinical indications. Drummond Jackson Essay. *SAAD Digest* 2017; **33**: 48.
3. Albadri SS, Jarad FD, Lee GT, Mackie IC. The frequency of repeat general anaesthesia for teeth extractions in children. *Int J Paediatr Dent* 2006; **16**: 45–48.
4. IACSD. *Standards for Conscious Sedation in the Provision of Dental Care* 2015. London: The Dental Faculties of the Royal Colleges of Surgeons and the Royal College of Anaesthetists, 2015.
5. Allen M, Thompson S. An equivalence study comparing nitrous oxide and oxygen with low-dose sevoflurane and oxygen as inhalation sedation agents in dentistry for adults. *Br Dent J* 2014; **217**: E18.

6. Gomes HS, Miranda AR, Viana KA *et al*. Intranasal sedation using ketamine and midazolam for pediatric dental treatment (NASO): study protocol for a randomized controlled trial. *Trials* 2017; **18**: 172.
7. Söchtig F, Hickel R, Kühnisch J. Caries detection and diagnostics with near-infrared light transillumination: clinical experiences. *Quintessence Int* 2014; **45**: 531–538.
8. Gomez J. Detection and diagnosis of the early caries lesion. *BMC Oral Health* 2015; **15**(Suppl 1): S3.
9. Greenwood GA. Oblique radiographs (Letter). *Br Dent J* 2009; **206**: 300.

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Alcohol identification and brief advice in dental settings

I read with interest the article by Shepherd and Ogden on alcohol and the dental team.[1] Dental teams are in a unique position to provide brief advice and support to their patients who drink above the lower risk levels.

Following the publication of the *UK Chief Medical Officers' Low Risk Drinking Guidelines*,[2] the section on alcohol misuse and oral health within *Delivery Better Oral Health: An Evidence-based Toolkit for Prevention* has been revised.[3] Lower risk drinking implies that no level of alcohol consumption is completely safe. The guideline states that 'lower risk' is not regularly exceeding 14 units per week, spread evenly over the week. This is the level that a patient's alcohol consumption should not exceed. For both men and women, increasing risk is regularly drinking more than 14 units per week.

In addition, a dedicated e-learning course entitled *Alcohol Identification and Brief Advice (IBA) in Dental Settings* has been developed for the whole dental team. This e-learning module consists of three sessions and an assessment. The sessions have been designed to help you learn more about alcohol units and the risks associated with alcohol consumption. You will see examples of undertaking alcohol IBA with your patients in a dental setting. The final stage of the e-learning resource is an assessment to test your knowledge gained and enables you to print a certificate on completing the course. This free e-learning course is available at **https://www.alcohollearningcentre.org.uk/eLearning/IBA**

References

1. Shepherd S, Ogden G. Alcohol and the dental team: relevance, risk, role and responsibility. *Dent Update* 2017; **44:** 495–501.
2. *UK Chief Medical Officers' Low Risk Drinking Guidelines*. August 2016. **https://www.gov.uk/government/publications/alcohol-consumption-advice-on-low-risk-drinking**
3. Public Health England. *Delivering Better Oral Health: An Evidence-based Toolkit for Prevention* 3rd edn. March 2017. **https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention**

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Cerebellar abscess with Fusobacterium nucleatum in a middle-aged man with periodontal disease

Fusobacterium nucleatum is an anaerobic micro-organism that is found only in the human oral cavity, where it co-exists with more than 500 other species.[1] It causes diseases such as periodontal and soft tissue abscesses, which can spread to the brain and cause intracerebral infection.[2] Infections of the brain involving *F. nucleatum* are uncommon but potentially severe, with many requiring surgery.[3]

Case presentation

Here we report a case of a 50-year-old man with a cerebellar abscess caused by *Fusobacterium nucleatum* that resulted in left-sided hemiplegia (Figures 1 and 2).

This patient presented in A&E following a fall, with left-sided weakness and pyrexia. CT and MRI imaging revealed a brain abscess in relation to the right

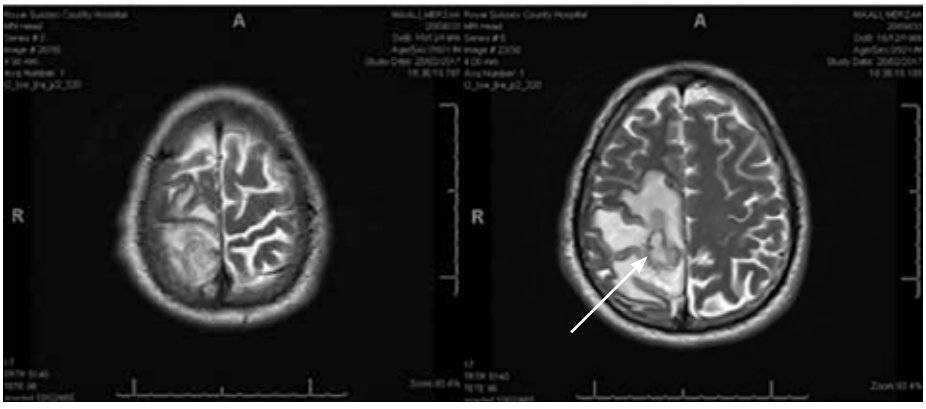

Figure 1. Magnetic Resonance Imaging (MRI) brain pre-contrast. There is restricted diffusion in relation to the right parietal/posterior frontal lesions. The appearances are typical for an abscess in view of the restricted diffusion rather than a neoplastic lesion. White arrow indicates cerebellar abscess formation.

Figure 2. MRI brain post contrast. White arrow indicates peri-lesional oedema and abscess cavity.

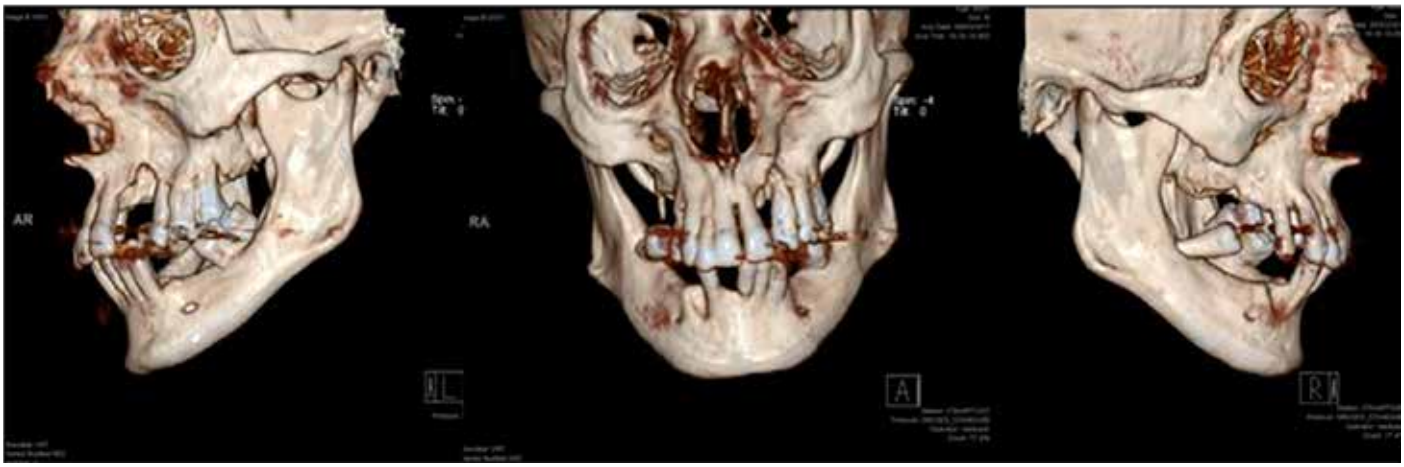

Figure 3. CT Mandible 3D reconstruction. There is severe, generalized chronic periodontal disease with substantial bone loss.

parietal/posterior frontal lesions. This is shown in Figures 1 and 2. After 48 hours of progressively worsening left-sided weakness, the patient underwent drainage of the right brain abscess and was treated with antibiotics.

Further drainage of the abscess was needed 11 and 17 days later as the repeat MRI scan showed increasing size of the abscess. Microscopy, culture and sensitivity from the cerebral abscess cultured *Fusobacterium nucleatum,* which is an anaerobic bacteria that inhabits the oral cavity.

The patient was subsequently reviewed by the maxillofacial team. The intra-oral clinical examination, as well as the CT mandible 3D reconstruction shown in Figure 3**,** confirmed the presence of generalized periodontal disease and periapical pathology. Multiple teeth were grade III mobile with associated periapical abscesses.

The maxillofacial team performed extraction of 13 of the patient's teeth under general anaesthetic with periapical abscesses and severe periodontal disease. From there the patient improved and subsequent CT head scans revealed no evidence of recurrent abscesses.

Discussion

Brain abscess of dental origin is a rare situation but deserves attention in the dental and medical community due to its high mortality rate and potential to cause disability.[4] The mechanism of spread is still not entirely known, however, a systematic review of 60 cases of intracranial abscesses of odontogenic origin found that the position of the brain abscess appeared unrelated to the side of dental involvement. This suggests that hematogenous spread is the most likely route of dissemination.[5]

One of the key treatments for cerebellar abscess is eradication of the primary focus of infection.[6] In this case, the maxillofacial team performed extraction of 13 of the patient's teeth under general anaesthetic and the patient subsequently made an uneventful recovery.

This case highlights the importance of periodontal health as this was the direct cause of the cerebellar abscess. When the maxillofacial team discussed this with the patient he was unaware that he had periodontal disease, despite being a regular attender at the dentist. Thus the importance of both education and treatment of periodontal disease in both primary and secondary care cannot be emphasized enough.

References

1. Kolenbrander P. Oral microbial communities: biofilms, interactions, and genetic systems. *Ann Rev Microbiol* 2000; **54:** 413–437.
2. Hischebeth G, Keil V, Gentil K, Boström A, Kuchelmeister K, Bekeredjian-Ding I. Rapid brain death caused by a cerebellar abscess with *Fusobacterium nucleatum* in a young man with drug abuse: a case report. *BMC Res Notes* 2014; **7**: 353.
3. Denes E, Barraud O. *Fusobacterium nucleatum* infections: clinical spectrum and bacteriological features of 78 cases. *Infection* 2016; **44**: 475–481.
4. Alvis-Miranda H, Castellar-Leones SM, Elzain MA, Moscote-Salazar LR. Brain abscess: current management. *J Neurosci Rural Pract* 2013; **4**(Suppl 1): S67–S81.
5. Azenha M, Homsi G, Garcia I. Multiple brain abscess from dental origin: case report and literature review. *Oral Maxillofac Surg* 2011; **16**: 393–397.
6. Yang S. Brain abscess: a review of 400 cases. *J Neurosurg* 1981; **55**: 794–799.

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