

seems to have been understood. With regard to the 'mixing' point, the BMJ has taken a similar approach for many years and indeed a 'tongue in cheek' paper in its 2017 Christmas issue was even picked up and enjoyed by the main national media. While we are not seeking to copy the BMJ we feel that some dental levity is just as appropriate and were delighted that in our issue, the second of its kind, we published contributions from readers who had been inspired by previous issues. To put this in another context, the BDJ publishes something of the order of 1,000 pages of editorial content a year; the 'spoo' matter takes up less than 0.01%. I am pleased to be able to reassure Dr Lawrence that we will not be marking the Summer Solstice or any other seasonal celebrations in a similar manner so he may read the rest of the 2018 issues with unguarded belief.

DOI: 10.1038/sj.bdj.2018.130

Oral surgery

A helpful wisdom tooth

Sir, we would like to share a rather amusing case involving an extraction technique on a tooth with its own point of application. A patient was admitted for removal of 38 under local anaesthetic in our outpatient department. The tooth was partly erupted but in a fairly vertical position. When a mucoperiosteal flap was raised we noticed a carious cavity buccally which was not visible on the radiograph. Therefore, without the need of bone removal, a Cryer elevator was applied to the cavity as a point of application and the tooth was elevated in a straightforward manner.

In the available literature the drilling of a cavity into a tooth to create an application point during elevation has been described.^{1,2} In our case this tooth already had an appropriately sized buccal cavity created by caries subgingivally and hence no drilling was required (Fig. 1). The figure reveals a slight distally curved root and the tooth morphology favoured the path of withdrawal of this tooth in a distal direction. With slight

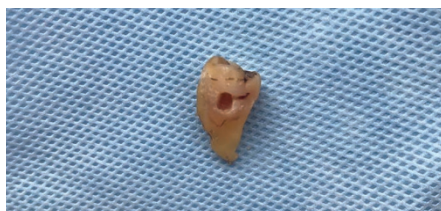


Fig. 1 The 'helpful' tooth which was straightforward to extract

rotation of Cryer elevator within the cavity the tooth eventually 'popped out' distally. This enabled the extraction in an atraumatic manner with no bone removal or tooth sectioning required.

J. Liew, A. Beech, Gloucester

1. Mamoun J. Use of elevator instruments when luxating and extracting teeth in dentistry: clinical techniques. *J Korean Assoc Oral Maxillofac Surg* 2017; **43**: 204–211.
2. Kaminishi R M, Davis W H, Nelson N E. Surgical removal of impacted mandibular third molars. *Dent Clin North Am* 1979; **23**: 413–425.

DOI: 10.1038/sj.bdj.2018.131

Pharmacology

MRONJ risk factor

Sir, medication-related osteonecrosis of the jaw (MRONJ) is a well-documented complication associated with bone modulating therapy from various bisphosphonates and denosumab. In additional anti-angiogenic medication (tyrosine kinase inhibitors and new biologics including monoclonal antibodies) have also been implicated and hence the list of drugs continues to grow. Once patients are 'at risk' of MRONJ, well established risk factors for development of the complication include dental extractions, smoking, trauma, poor dental health and those who are immunocompromised and immunosuppressed. In this latter group certain medications such as corticosteroids, azathioprine, mycophenolate mofetil and methotrexate have been particularly identified.

Leflunomide (Arava) is a disease modifying anti-rheumatic drug (DMARD) that has been used in the treatment of rheumatoid and psoriatic arthritis for many years and can be given in combination with bisphosphonates and methotrexate. *In vitro* studies indicate that leflunomide selectively inhibits RANK-L-induced differentiation of osteoclast, which in turn directly affects bone remodelling as well as inhibiting several tyrosine kinases.¹ These actions are exactly those targeted by the various implicated MRONJ drugs mentioned earlier.

Leflunomide has not been reported as a MRONJ drug. However, we wish to highlight this drug as a possible candidate to be added to the other immunosuppressants that have already been recognised to increase the risk of MRONJ when taken in conjunction with bone modulating and anti-angiogenic therapy. In our dedicated jaw necrosis clinic, 102 patients have been registered with MRONJ of which only two cases are from oral bisphosphonates. In

these two cases one patient had bilateral maxillary MRONJ (alendronic acid two years, leflunomide six years) following dental extraction. In addition to this case a further two cases of methotrexate related jaw necrosis are also being managed. Methotrexate jaw necrosis is very rare and often preceded by lymphoproliferative disorder, however, in both our cases this was absent but both on long-term leflunomide.² Of these two cases, one failed to heal post extraction while the other case had spontaneous necrosis in a dentate region.

Leflunomide is not a new drug and in the absence of literature reported cases of osteonecrosis of the jaw directly related to it as well as evidence of its impact on bone, it remains reasonable to consider it as a risk factor for MRONJ along with the other already recognised immunosuppressant when taken concomitantly with those drugs that have been implicated in jaw necrosis.

D. Patel, V. Patel, by email

1. Urushibara M, Takayanagi H, Koga T *et al*. The antirheumatic drug leflunomide inhibits osteoclastogenesis by interfering with receptor activator of NF- κ B ligand-stimulated induction of nuclear factor of activated T cells c1. *Arthritis Rheum* 2004; **50**: 794–804.
2. Henien M, Carey B, Hullah E, Sprout C, Patel V. Methotrexate-associated osteonecrosis of the jaw: A report of two cases. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2017; **124**: e283–287.

DOI: 10.1038/sj.bdj.2018.132

No studies

Sir, I wish to congratulate Patel and colleagues for their article¹ in which they evaluated medication-related osteonecrosis of the jaw (MRONJ) in early stage breast cancer.¹ The authors stated that oral clodronate and i.v. zoledronic acid appear to be equally effective in reducing breast cancer recurrence and mortality in the adjuvant setting. However, to date, there are no studies comparing efficacy of oral bisphosphonates with i.v. zoledronic acid in terms of reducing clinical outcome when they are used in breast cancer at adjuvant setting. Furthermore, it is expected that intravenous bisphosphonates could be more effective than oral due to their potentially more anti-tumoral activity.²

K. Altundag, Ankara, Turkey

1. Patel V, Mansi J, Ghosh S *et al*. MRONJ risk of adjuvant bisphosphonates in early stage breast cancer. *Br Dent J* 2017; **224**: 74–79.
2. Tonyali O, Arslan C, Altundag K. The role of zoledronic acid in the adjuvant treatment of breast cancer: current perspectives. *Expert Opin Pharmacother* 2010; **11**: 2715–2725.

DOI: 10.1038/sj.bdj.2018.133