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Pathological fracture of the coronoid process secondary to medication-related osteonecrosis of the jaw (MRONJ)

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ABSTRACT

INTRODUCTION: Medication-related osteonecrosis of the jaw (MRONJ) is a growing problem within the field of oral and maxillofacial surgery. It is defined as the presence of exposed necrotic alveolar bone that does not resolve over a period of 8 weeks in a patient taking bisphosphonates, who has not had radiotherapy to the jaw [1]. Since the first report in 2003 that highlighted the potential harm caused by MRONJ, many more patients have been diagnosed with the condition [2]. The growth in recent years is likely due to the more potent drugs delivered intravenously however there is some evidence that oral bisphosphonates given over longer periods of time can have similar effects. Bone exposure may occur spontaneously or most commonly occurs following an invasive dental procedure, as shown in the case below [3].

PRESENTATION OF CASE: This case report demonstrates the unpredictable nature of symptoms associated with medication related osteonecrosis and its management within the hospital environment.

DISCUSSION: This case demonstrates the unpredictable nature of MRONJ and how the disease can progress to cause significant morbidity. In this case extensive surgery was required to remove the necrotic fragments of bone with no guarantee that the necrosis will stop spreading.

CONCLUSION: It seems a matter of great importance that the lasting effects of MRONJ are known to general dental and medical practitioners alike. Nationally recognised evidence based guidelines are lacking and uniformity in the management of MRONJ is required amongst the speciality.

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1. Case report

A 77-year old female was referred to our clinic with a prolonged period of delayed healing following the uneventful extraction of the lower right second molar tooth in May 2007. At this point the patient had been taking alendronic acid 70 mg orally once per week for seven years. The patient had a history of osteoporosis and total hip replacement. Clinical examination revealed only mild erythema overlying the socket, with no evidence of any osteonecrotic process, either clinically or radiographically. The patient was reviewed and later discharged.

The patient attended the following year in November 2008 with right sided facial pain following recent curettage of the affected socket by her dentist. The patient was discharged following an extended course of penicillin V and metronidazole accompanied with chlorhexidine mouthwashes.

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Over three years later in June 2012 the patient re-attended with a repeat occurrence of her symptoms. Clinically there was no evidence of infection or discharge but radiographically there remained a clearly demarcated radiolucency over the right posterior mandible (Fig. 1).

The patient underwent further curettage, this time under general anaesthetic. The histopathology findings confirmed bone necrosis consistent with MRONJ, and ruled out dysplasia or malignancy. The patient was discharged following resolution of her symptoms. The patient's most recent attendance was in October 2013 where she attended with increasing trismus and some swelling over the right posterior mandible. Clinically there was pus draining intraorally from the site. Radiographic examination revealed a much more extensive area of necrosis at the right body and ramus of the mandible spreading to involve the coronoid process and the appearance of a pathological fracture (Fig. 2).

A CT image was taken to assess the extent of the necrosis. The CT images and 3D reconstruction are shown below (Figs. 3–5). Arrangements were made to review her current alendronic acid therapy.



Fig. 1. Panoramic radiograph taken 6.6.12.



Fig. 2. Panoramic radiograph taken 27.9.13.



Fig. 3. CT coronal section showing pathological fracture of the right coronoid process.

Exploration of the right side of the mandible with removal of the fractured coronoid process and debridement of necrotic bone was carried out at The Royal Surrey County Hospital in December 2013. Intraoperative examination revealed pus draining from the right posterior mandible (Fig. 6).

An incision was made to explore the body, ascending ramus, and coronoid process of the mandible. The inferior alveolar and lingual nerves were protected and the coronoid process located. The coronoid process was gripped firmly to prevent the temporalis pulling the fragment superiorly, and gently removed (Fig. 7).

Once the coronoid process was removed, gentle curettage of the necrotic bone was carried out using a slow hand piece and saline irrigation. Necrotic bone was removed leaving a margin of bleeding

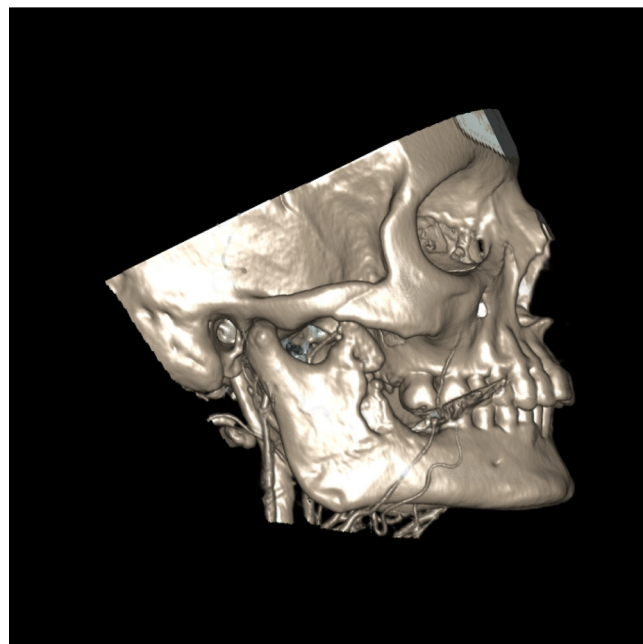


Fig. 4. 3D reconstruction of the CT image showing pathological fracture of the right coronoid process and the extent of bony necrosis.

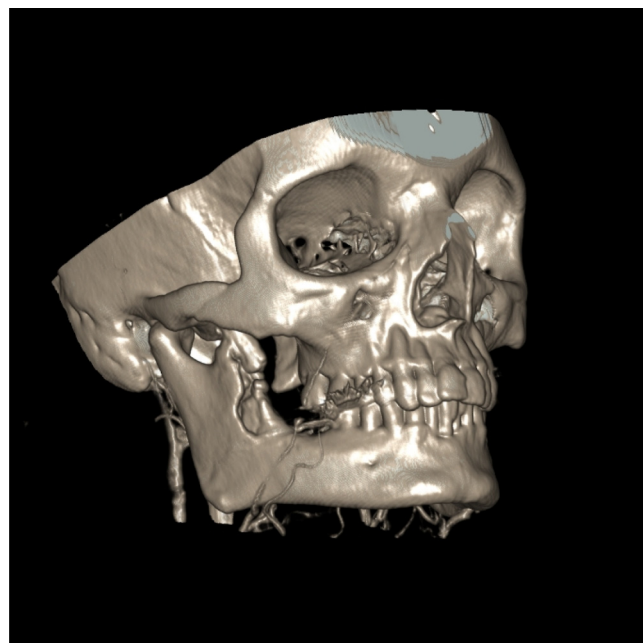


Fig. 5. 3D reconstruction of the CT image showing pathological fracture of the right coronoid process and the extent of bony necrosis.

bone with normal appearance thus indicating sufficient metabolic potential for healing to take place (Fig. 8) [3–6]. The removed fragment is shown in Fig. 9.

The site was thoroughly irrigated with chlorhexidine and closed primarily. The patient was admitted for two nights following the procedure where she received intravenous metronidazole, and was discharged with oral antibiotics and chlorhexidine mouthwashes four times per day for two weeks.



Fig. 6. Pus draining from the non-healing mucosa overlying the ascending ramus.

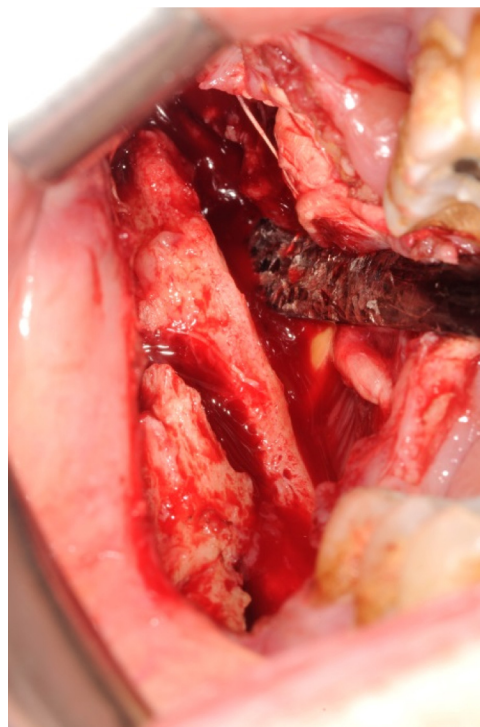


Fig. 8. Necrotic bone carefully removed until healthy bone seen.

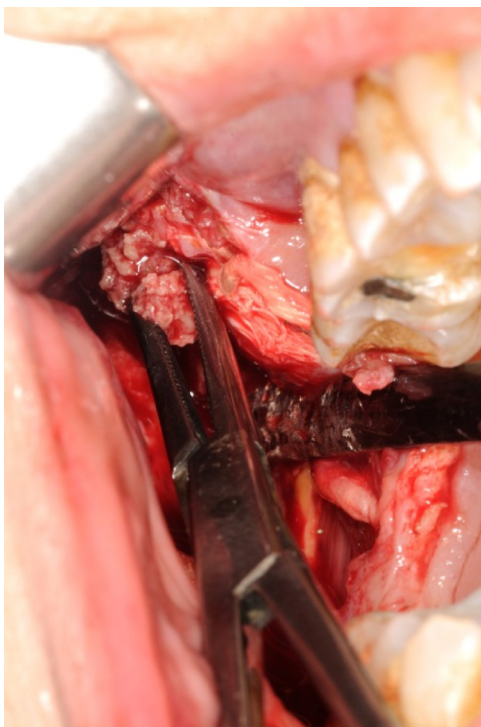


Fig. 7. The coronoid process was gripped with forceps and gently removed.



Fig. 9. Shows the fractured coronoid process and shape conforming to that on the panoramic radiograph.

2. Discussion

This case demonstrates the unpredictable nature of MRONJ and how the disease can progress to cause significant morbidity. In this case extensive surgery was required to remove the necrotic fragments of bone with no guarantee that the necrosis will stop spreading.

At present, the incidence of MRONJ in patients taking alendronic acid for osteoporosis is 1:1000–1:1,700 however, this incidence increases with the duration of treatment [7–9].

Our case illustrates the extent of the damage that can be caused when straightforward dental procedures are carried out in low risk patients taking oral bisphosphonates. It is important to realise that osteonecrosis may remain asymptomatic for long periods in the absence of infection [10]. It seems a matter of great importance that national evidence based guidelines are published on the dental treatment of patients taking bisphosphonates, and that further information regarding the possible consequences of bisphosphonate use is given to general medical practitioners.

Conflict of interest

There are no conflicts of interest. Written informed consent for publication in print and electronic form, and publication of radiographic and photographic images was granted by the patient.

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Ethical approval

Written informed consent for publication in print and electronic form, and publication of radiographic and photographic images was granted by the patient.

Author contribution

Authors	Conception and design of study/review/case series	Acquisition of data: laboratory or clinical/ literature search	Analysis and interpretation of data collected	Drafting of article and/or critical revision	Final approval and guarantor of manuscript
Adam Jowett	✓	✓ Clinical/ Literature search	✓	✓	✓
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