CASE REPORT

Discovery from a lateral oblique radiograph

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SUMMARY

In many oral and maxillofacial surgery units and emergency departments, lateral oblique radiographs are not routinely included in radiological investigations for suspected mandibular fractures because orthopantomogram and posteroanterior mandible views usually suffice. This paper reports a case where a lateral oblique radiograph proved to be very useful in managing a fractured atrophic mandible. This case report highlights the importance of considering the use of alternative radiographs for suspected fracture(s) of an atrophic mandible to exclude the unexpected.

BACKGROUND

This case report describes a case where the use of a lateral oblique radiograph played a crucial role in the diagnosis and treatment planning of atrophic mandibular trauma. Mandibular fracture is a relatively common injury encountered in oral and maxillofacial surgery units and emergency departments. This case highlights the importance of considering alternative radiographic investigations for atrophic mandibular fractures. With the growing elderly population and subsequent increase in the number of atrophic mandibles, it is hoped that the readers from disciplines of emergency medicine, maxillofacial surgery and radiology will find this case report interesting.

CASE PRESENTATION

A 73-year-old man presented to the emergency department, having fallen and hit his chin on a step while walking up the stairs in a park. There was a possibility that this was a mechanical fall, but the more likely cause was a faint due to shortness of

breath secondary to lower respiratory tract infection.

Medical history revealed that the patient had hypertension, angina on exertion, atrial fibrillation and insulin-controlled type 2 diabetes mellitus with usual blood glucose level of 15–17. He was regularly taking warfarin, β -blockers, statins and insulin. He was on holiday from Scotland. He was an ex-smoker and consumed alcohol occasionally.

On extraoral examination, he had bruising and swelling on the chin and paraesthesia in the V₃ region bilaterally. Intraoral examination revealed that he was edentulous and had an Atwood VI classification lower ridge. He wore a set of 10-year-old complete dentures, which usually occlude into class III, anterior cross-bite position, but his denture occlusion seemed deranged from the injury. His anterior mandible segment was mobile and there was bruising in the floor of the mouth.

INVESTIGATIONS

Head injury was cleared by CT, but this study did not include facial bones. From an orthopantomogram and a posteroanterior mandible radiograph (figure 1), bilateral, displaced fractures of bodies of the Luhr III atrophic mandible were observed.

Subsequently, the patient underwent open reduction and internal fixation of his mandible under general anaesthesia. An extraoral approach was used for his right mandible and intraoral for the left. Two four-hole plates and 6 mm screws were used. The next morning, he had postoperative orthopantomogram and lateral oblique radiograph (figure 2) with a view to discharge. However, the results of the radiographs indicated that he could not be discharged that day. Unexpectedly, the

Figure 1 (A) Preoperative orthopantomogram radiograph from which bilateral, displaced bodies of Luhr III atrophic mandible are observed. (B) Preoperative posteroanterior mandible radiograph that excludes condylar fracture but does not clearly demonstrate any fractures.

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Figure 2 (A) Postoperative orthopantomogram radiograph showing partial reduction of the fractures in bodies of the atrophic mandible. (B) Postoperative right lateral oblique view clearly demonstrating a displaced symphyseal oblique fracture that was not obvious in other views.

lateral oblique radiograph revealed a displaced long oblique symphyseal fracture of the mandible that had not been observed by five clinicians, including two maxillofacial consultants, who saw the patient and radiographs preoperatively.

TREATMENT

As a result, the patient underwent another operation. The existing plates were removed and a 2.4 mm reconstruction plate was used to reduce all three fractures and support his thin mandible. Postoperative radiographs (figure 3) showed good reduction and no new surprise this time.

OUTCOME AND FOLLOW-UP

Two months following the patient's operation, he was reviewed in a maxillofacial unit in Scotland. From correspondence, I understand that his mandible is healing well clinically and radiographically, but he is having difficulty eating due to the numbness of his lower lip as well as the inability to wear his lower complete denture. In view of his insulin-controlled type 2 diabetes mellitus, he was seeing a dietician to ensure good diabetic control and prevention of further weight loss, and had arranged for construction of new dentures.

DISCUSSION

Atrophy of the mandible occurs as a result of a series of biological processes following loss of teeth.¹ The alveolar process is gradually lost, especially when the edentulous area is loaded with a dental prosthesis.² An atrophic mandible, especially the body of the mandible, is more vulnerable to fracture due to the decreased bone mass.² Usually, fracture of the atrophic mandible occurs in elderly patients who have medical history that increases operative risk.

These fractures have increased risk of fibrous or non-union, owing to decreased osteogenesis in elderly patients as well as several local factors: reduced cross-section and smaller contact area of the fractured ends, and the dense, sclerotic, poorly vascularised bone.² Hence, well-considered treatment planning using good quality of imaging is of paramount importance.

Lateral oblique radiographs of the mandible are not often included as part of radiographic investigations for isolated mandibular trauma in the UK, as the standard views usually suffice. However, this view has proven to be very useful for this case by demonstrating a long oblique symphyseal fracture that was not obvious on the other views due to the superimposition of the

Figure 3 Orthopantomogram radiograph (A) and posteroanterior mandible radiograph (B) after the second operation, showing the use of a reconstruction plate for reduction and support of the atrophic mandible.

Learning points

- ▶ Atrophic mandibles are more prone to fracture due to decreased bone mass, and have increased risk of fibrous/non-union due to various systemic and local factors.
- ▶ Atrophic mandibular fractures are mostly seen in elderly patients with increased operative risks. Careful clinical and radiological assessment is essential to avoid further procedures.
- ▶ It may be prudent to consider alternative radiography for atrophic mandibular trauma.

cervical spine. Had this view been taken preoperatively, this elderly patient with the American Society of Anaesthesiologists (ASA) physical state classification grade III would have avoided a repeat episode of general anaesthesia.

Other radiographic techniques such as an occlusal view or CT would have also illustrated this symphyseal fracture. The use of

CT for isolated mandibular trauma is debateable due to the high cost, extra radiation, artificial defect from restorations in dentate patients and the patients having to remain motionless for the period of image acquisition.³

In conclusion, for cases where the mandible is atrophied and therefore more prone to multiple fractures, and where occlusal assessment is difficult due to edentulism/old dentures, it may be prudent to consider alternative views to exclude the unexpected.

Competing interests None declared.

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