

# Dentures may be radiolucent

A L Firth, J Moor, P W A Goodyear, D R Strachan

*Emerg Med J* 2003;20:562–563

Diagnosing ingested dental prostheses can be difficult and delays in treatment may result in serious complications. Patients often present with a vague history and very few reliable clinical signs. In addition, the fact that dental plates are often radiolucent may lead to the diagnosis being overlooked with disastrous consequences. A case of successful diagnosis and treatment is presented, and the importance of a high index of clinical suspicion to avoid the morbidity and mortality associated with missed impacted dentures is discussed.

A 55 year old man presented to accident and emergency reporting that he had swallowed his dentures. He fell asleep with his dentures in situ and awoke adentulous with dysphagia and dysphonia. There was mild tenderness on palpation of the cricoid cartilage but no surgical emphysema. Lateral soft tissue neck radiograph revealed no radio-opaque foreign body, however the patient was referred to the ear, nose, and throat department for assessment. The radiograph demonstrated a column of air visible in the proximal oesophagus and widening of the prevertebral fascia (fig 1). Flexible nasopharyngolaryngoscopy showed evidence of the dental plate within the hypopharynx, lodged within the lumen of the cricopharynx.

Emergency pharyngoscopy was therefore performed. The dentures were impacted within the cricopharynx and there were surrounding mucosal abrasions. The dentures were removed intact and the patient was discharged the following morning symptom free and was well at follow up two weeks later.

## DISCUSSION

Impacted foreign bodies in the trachea and oesophagus are a common problem. Impacted dentures, usually broken or partial dentures, accounted for 11.5% of foreign bodies in a series by Abdullah *et al.*<sup>1</sup> Ingestion usually occurs after trauma, intoxication, loss of consciousness or sleep, so there may not be a definite history of ingestion. Prompt management is vital if significant morbidity, and mortality is to be avoided.<sup>1 2</sup>

Soft tissue lateral radiographs of the neck are routinely performed. There is, however, debate as to the value of the use of plain radiographs in such cases as dental plates are radiolucent (in contrast with natural teeth, which can be seen on plain radiography). This has been the case since the 1940s when radiolucent acrylic materials replaced radio-opaque vulcanite as the main denture material.<sup>2-4</sup> It is no surprise therefore that in Abdullah's series only 22% of dental prostheses impacted in the oesophagus showed evidence of a foreign body on the lateral neck radiograph. All of these had radiolucent wires attached.

Jones *et al*<sup>5</sup> found that lateral soft tissue films of the neck changed the management in only 1.4% cases. Signs commonly associated with the ingestion of a foreign body include

foreign body shadow, air in the oesophagus, increased prevertebral shadow, salivary pooling/level, and loss of cervical lordosis.<sup>6</sup> According to Marais *et al* none of these commonly recognised radiological features are associated with a high positive prediction rate.<sup>6</sup>

It should be noted that foreign bodies in the oesophagus can result in significant morbidity and mortality if the duration of impaction is prolonged. The foreign body may become buried in the progressive mucosal oedema resulting in possible fistulisation and perforation. Cases of tracheo-oesophageal fistulas, aortic erosion, aorto-oesophageal fistulas, and even oesophago-broncho-aortic fistula after perforation have been reported.<sup>7-10</sup> Not surprisingly complications have been shown to be more likely if there is a delay in treatment with the rate of complications rising from 3.2% after 24 hours to 23.5% after 48 hours.<sup>11 12</sup> The radiolucent nature of dentures on neck radiographs, particularly if not appreciated by the treating emergency physician, may contribute to such a delay in diagnosis and definitive treatment.

The use of a radio-opaque material in the manufacture of dental plates may reduce the incidence of missed or delayed diagnoses when such plates are ingested. As yet none of the methods for making dentures visible on plain radiograph meet all of the required needs of a denture base material.<sup>13</sup> It is therefore important, in order to prevent accidental ingestion, that dentures should be made to fit properly and damaged or malfitting dentures should be discarded and



**Figure 1** Lateral neck radiograph demonstrates air within the proximal oesophagus and widening of prevertebral fascia.

replaced. In addition patients should be strongly advised against wearing them in bed.<sup>12</sup>

## CONCLUSION

In cases of dental plate ingestion the history may be vague and few clinical signs may be present. In addition dentures may be radiolucent, therefore accident and emergency physicians must maintain a high index of suspicion in such cases.

Lateral soft tissue radiographs do have a role in confirming pathology if they are abnormal, eliciting signs such as air in the oesophagus and increased prevertebral shadow. However, a normal radiograph does not exclude pathology. Therefore, even in the absence of radiological abnormalities, urgent referral to ENT is still indicated in the presence of the following signs/symptoms:

- total or partial dysphagia (difficulty swallowing)
- discomfort or pain in the throat or neck
- pooling or excessive production of saliva.

### Authors' affiliations

**A L Firth, J Moor, P W A Goodyear, D R Strachan**, Department of Otolaryngology, Bradford Royal Infirmary, Bradford, UK

Correspondence to: Mr D R Strachan, Department of Otolaryngology, Bradford Royal Infirmary, Duckworth Lane, Bradford BD9 6RJ, UK; drstrachan@aol.com

Accepted for publication 6 January 2003

## REFERENCES

- 1 **Abdullah BJ**, Teonh LK, Mahadevan J. Dental prosthesis ingested and impacted in the oesophagus and orolaryngopharynx. *J Otolaryngol* 1998;**27**:190–194.
- 2 **Creighton University Medical Center**. <http://cudental.creighton.edu/htm/history.htm>.
- 3 **Newton JP**, Abel RW, Lloyd CH, *et al*. The use of computed tomography in the detection of radiolucent denture based material in the chest. *J Oral Rehabil* 1987;**14**:193–202.
- 4 **Knowles JEA**. Inhalation of dental plates-A hazard of radiolucent materials. *J Laryngol Otol* 1991;**105**:681–2.
- 5 **Jones NS**, Lanningan FJ, Salaama NY. Foreign bodies in the throat: a prospective study of 388 cases. *J Laryngol Otol* 1991;**105**:104–8.
- 6 **Marais J**, Mitchell R, Wightman AJA. The value of radiographic assessment of oropharyngeal foreign bodies. *J Laryngol Otol* 1995;**109**:452–4.
- 7 **Nashef SAM**, Klein C, Martigne C, *et al*. Foreign body perforation of the normal oesophagus. *Eur J Cardiothorac Surg* 1992;**6**:565–7.
- 8 **Singh B**, Puri ND, Kakar PK. A fatal denture in the oesophagus. *J Laryngol Otol* 1978;**92**:829–31.
- 9 **Taha AS**, Nakshabendi I, Russell RI. Vocal cord paralysis and esophago-broncho-aortic fistula complicating foreign body induced oesophageal perforation. *Postgrad Med J* 1992;**68**:277–8.
- 10 **Rajesh PB**, Gaiti JJ. Late onset tracheo-oesophageal fistula following a swallowed dental plate. *Eur J Cardiothorac Surg* 1993;**7**:661–2.
- 11 **Lim CT**, Quah RF, Loh LE. A prospective study of ingested foreign bodies in Singapore. *Arch Otolaryngol Head Neck Surg* 1994;**120**:96–102.
- 12 **Yeoh NTL**. Impacted dentures in the oesophagus. *Med J Malaysia* 1982;**37**:344–8.
- 13 **Chandler HH**, Bowen RL, Paffenbarger GC. The need for radiopaque denture base materials: a review of the literature. *J Biomed Mater Res* 1971;**5**:245–52.

# A case of isolated proximal tibiofibular joint dislocation while snowboarding

C Ellis

*Emerg Med J* 2003;**20**:563–564

**D**islocation of the proximal tibiofibular joint is an uncommon injury and is often misdiagnosed. If unrecognised it is potentially a source of ongoing morbidity. Knowledge of this condition among emergency medicine specialists is not widespread. No association with snowboarding has previously been reported.

## CASE REPORT

A 30 year old inexperienced snowboarder fell while sliding backwards on a snowboard. This resulted in upper body rotation while the lower body remained attached to the board facing uphill. The patient experienced sudden onset of severe left lateral knee pain. On releasing the board bindings there was a significant improvement in the pain, but a dull ache persisted, which was exacerbated by walking down hill. Despite rest, elevation, and anti-inflammatory agents the discomfort persisted. The following day a consultation with a sports physiotherapist was arranged. A diagnosis of left fibula head dislocation was made and the patient subsequently underwent closed manipulation, without sedation or analgesia, with immediate resolution of symptoms. His knee was not immobilised and he remains symptom free at 12 months.

## DISCUSSION

Several recent articles have reported injuries common among snowboarders.<sup>1,2</sup> The injuries described include head and cervical spine injuries, dislocation, and ligamentous injury of the shoulder, wrist fractures and sprains, and fractures of knees and ankles. The nature of the boot and bindings of the snowboard offer protection to the ankle and knee, with a reduction in ankle and knee injuries in comparison with downhill skiers. Fractures of the lateral process of the talus, an otherwise uncommon fracture, accounts for 15% of ankle injuries in snowboarders.<sup>1</sup>

Isolated subluxation or dislocation of the proximal tibiofibular joint is an uncommon and under recognised injury, and we believe an association with snowboarding has not previously been reported. Anecdotally sports physiotherapists locally report seeing increasing numbers of tibiofibular joint subluxation/dislocations associated with snowboarding accidents.

The principal emergency medicine texts make no reference to proximal tibiofibular joint dislocation,<sup>3,4</sup> and the coverage of this problem is scant in the orthopaedic texts. In the English language literature there have only been case reports and several small series published.<sup>5–8</sup>

The tibiofibular joint is the articulation between the fibula head and the inferior surface of the lateral condyle of the tibia. It is surrounded by a fibrous capsule and broad anterior and posterior ligaments. The joint is reinforced anteriorly by the biceps femoris tendon, inserting into the fibula head. Posteriorly the popliteus tendon reinforces it. Additional support is gained from the fibular collateral ligament superiorly and inferiorly by the interosseous ligament. The joint is intimately associated with the common peroneal nerve, moving forward from the popliteal fossa around the fibula head.

Tibiofibular head dislocations have been classified by Ogden, as subluxation only (type I), anterolateral (type II), posteriosuperior (type III), and superior (type IV), with type II being the most common.<sup>8</sup> Types II and III are more likely to be associated with a peroneal nerve injury, the most common complication of this injury.

The mechanism of injury in previous case reports has been described as a sudden inversion and plantar flexion of the foot and ankle, with a simultaneous knee flexion and external rotation of the leg. For this reason it is commonly associated with lateral ankle injuries. In this case the proposed mechanism of injury was different. Typical snowboard boots provide very firm support for the ankle and lower leg, offering stability and protection from injury. We propose that the dislocation in this case was a result of active resisted rotation of the leg, and believe that this injury was only a step removed from a major rotational injury to the knee itself or a tibial shaft fracture.

The diagnosis of proximal tibiofibular joint dislocation is essentially a clinical one, requiring a high level of suspicion. It should be considered in any patient presenting with lateral knee pain and difficulty in weight bearing who has a consistent history. Because of the nature of the presentation it is commonly mistaken for a meniscal injury. On physical examination there is often surprisingly free movement of the knee joint and no effusion. There is usually proximal tenderness over the fibula and in the case of anterior dislocation an anterolateral prominence of the fibula head. Plain radiology is generally unhelpful, with the abnormalities only apparent on comparison with a post-reduction film or on a comparison view of the other knee. The principal abnormality is lateral displacement on the anteroposterior view and either slight anterior or posterior displacement on the lateral view.<sup>9</sup> It has been suggested that computed tomography of the knee may be appropriate in patients where this diagnosis is suspected, because of the poor utility of plain radiology.<sup>10</sup>

The management of type I and II injuries is reduction by anteroposterior pressure over the fibula head, with the knee slightly flexed and the ankle everted. There is often an audible and/or palpable movement with rapid improvement in symptoms. Significant analgesia or sedation is usually not required. There is insufficient evidence to support or refute the use of immobilisation after a reduction of a type I or II injury, although several previous case reports have recommended immobilisation for varying periods.<sup>5 7 8</sup>

Reduction of type III and IV injuries is more difficult and may require open reduction and fixation, but it is reasonable to attempt closed reduction as an initial treatment. Several techniques have been described involving fixation and stabilising with a portion of the biceps femoris tendon.<sup>11 12</sup> Because this injury is commonly missed a number of patients present with chronic lateral knee pain or joint instability. There is no role for attempted closed reduction in this situation. Patients with chronic pain secondary to this condition have been successfully treated with excision of the fibula head.

In conclusion, dislocation of the proximal tibiofibular joint is an uncommon injury, which is commonly misdiagnosed. It is a potential cause of chronic knee pain and disability. For this reason it is important for emergency medicine specialists to be aware of this condition. It should be considered in the differential diagnosis of a patient who presents with lateral knee pain.

## ACKNOWLEDGEMENTS

Thanks to Dr Michael Roberts for reading this case report and offering advice and suggestions.

## Author's affiliation

C Ellis, Department of Emergency Medicine, Royal Perth Hospital, Perth, Western Australia, Australia 6000; loucr@hn.ozemail.com.au

Funding: none.

Conflicts of interest: none declared.

Accepted for publication 27 November 2002

## REFERENCES

- Dunn KA. What are the health hazards of snowboarding? *West J Med* 2001;**174**:128–30.
- Ferrera PC. Injury patterns with snowboarding. *Am J Emerg Med* 1999;**17**:575–7.
- Marx JA, Hockberger RS, Walls RM. *Emergency medicine: concepts and clinical practice*. Chicago: Mosby, 2001.
- Tintinalli E, Kelen G, Stapczynski J. *Emergency medicine: a comprehensive study guide*. New York: McGraw Hill, 1999.
- Love JN. Isolated anterolateral proximal fibular head dislocation. *Ann Emerg Med* 1992;**21**:757–9.
- Thomason PA, Linson MA. Isolated dislocation of the proximal tibiofibular joint. *J Trauma* 1986;**26**:192–5.
- Turco VJ, Spinella AJ. Anterolateral dislocation of the head of the fibula in sports. *Am J Sports Med* 1985;**13**:209–15.
- Ogden JA. Subluxation and dislocation of the proximal fibula joint. *J Bone Joint Surg* 1974;**56-A**:145–54.
- Keene JS. Diagnosis of undetected knee injuries. Interpreting subtle radiologic findings. *Postgrad Med* 1989;**85**:153–63.
- Vaglino JA, Denton JR. Acute traumatic proximal tibiofibular dislocation confirmed by computer tomography. *Orthopaedics* 1999;**22**:255–8.
- Mittingen H, Kettunen J, Vaatainen U. Dislocation of the proximal tibiofibular joint. A new method of fixation. *Arch Orthop Trauma Surg* 1999;**119**:358–9.
- Rajkumar P, Schmitten GF. A new surgical treatment of an acute dislocation of the posterior tibiofibular joint. *Int J Clin Practice* 2002;**56**:556–7.