Emergency Cricothyrotomy for a partially swallowed Dental Plate

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Citation

Abstract
We report a case of an emergency cricothyrotomy following attempted removal of a partially swallowed dental plate in a 47 year old male. There was no initial airway compromise, and following an uneventful inhalational induction removal of the plate was attempted under direct vision. This was unsuccessful and, after an inability to intubate due to the translaryngeal position of the plate, a cricothyrotomy kit was made immediately available. Further attempted removal resulted in a “can't intubate, can't ventilate” situation and emergency surgical cricothyrotomy was performed.

INTRODUCTION
The clinical scenario of the swallowed or inhaled denture has been well documented (1) and, as with any pharyngeal or laryngeal foreign body, there is the potential for loss of airway control. This report describes the management of a 47-year-old male who presented with a partially swallowed dental plate and no initial airway compromise.

CASE
We were recently presented with a case of a 47 year-old male requiring general anaesthesia for the removal of partially swallowed dental plate. The man was overweight, but previously well. There was no evidence of airway compromise and no difficulty swallowing saliva, but speaking was painful as a result of the plate being lodged sagitally over his larynx (Figure 1).

Figure 1
Figure 1: Plate wedged in larynx

Consideration was given by the ENT Registrar to attempting removal of the plate in A+E under a ‘quick GA’, but it was decided that moving to ENT theatre would be more sensible. Plan A was to perform an inhalational induction with Sevoflurane in oxygen and simply allow the surgeons to remove the plate under direct vision. Despite a 'heavy jaw', the airway could be maintained without the use of adjuncts.
The surgeon, however, could not easily dislodge the plate and so it was decided to move to Plan B, namely to intubate the trachea to maintain and protect the airway during the anticipated surgical ‘struggle’.

Despite a grade 1 laryngoscopic view and the ability to pass a bougie into the trachea, even a microlaryngoscopy tube would not pass the denture. Anaesthesia was maintained via a facemask, while the ENT surgeon prepared for Plan C, namely straight-bladed (surgical) laryngoscopy. A cricothyrotomy kit and a tracheostomy tray were also prepared and the ENT consultant was called.

Airway control was lost when the ENT surgeon inadvertently dislodged the plate so that it lay in the coronal plane over the larynx and effectively caused complete airway obstruction. With oxygenation deteriorating, the surgeon made one unsuccessful attempt at intubation. This was followed immediately by the surgeon performing a cricothyrotomy with a wide-bore (anaesthetic) cuffed cannula. Ventilation was successful via this device and, with gas exchange restored, the plate was successfully removed. As the supraglottis was left severely oedematous, it was decided that the patient should be intubated before undergoing tracheostomy and transfer to ICU. He made a full recovery.

**DISCUSSION**

The phenomenon of the swallowed or inhaled denture is well documented and a not uncommon cause of medico-legal action (1). They most frequently become lodged in the oesophagus and can be ‘missed’ (many plates are not radiopaque like the one in this case). Plates in the pharynx and larynx must be given serious consideration as the possibility of loss of airway control exists.

The clinical scenario presented is not unusual in the first instance, although the development of complete airway obstruction is atypical. This case was anaesthetised in the anaesthetic room as the plate removal was expected to be uneventful. With the benefit of hindsight, however, the anaesthetists perhaps should have been more wary that this airway could deteriorate acutely, particularly with the X-ray appearance suggesting the ‘hook’ of the plate being imbedded, perhaps in the cricothyroid membrane (figure 1). Removal under local anaesthesia was not considered to be feasible and so managing the airway under general anaesthesia had to be planned.

The experienced ENT SpR called his consultant as soon as the second airway management plan, namely intubation, proved unsuccessful. It is debatable as to whether he should have been called sooner in a scenario of laryngeal foreign body..

We feel the main issue in such a scenario is that of achieving ventilation. The decision was taken to maintain spontaneous respiratory effort, as is the classical training in the management of an inhaled foreign body, although this foreign body was at the level of the larynx and not below it. Would paralysis have facilitated successful ventilation once the plate had changed position? Would it have made removal of the plate easier? Another ventilatory option might have been the placement of a catheter for subglottic jet ventilation (such as a Hunsaker Mon-Jet ventilation tube) once initial intubation had failed, but this would have been a relatively ‘fragile’ ventilating device. A further alternative in cases where the upper airway is considered ‘high risk’ is the prophylactic placement of a cricothyroid (narrow bore) cannula prior to the induction of anaesthesia. In this case, however, this technique may have been unwise, as the plate may have been dislodged during cannula insertion, potentially causing airway deterioration.

We feel this case was managed well. Inhalational induction and airway maintenance were performed well (without airway adjuncts that may have dislodged the plate). Keeping the airway open was difficult in this case and maintenance of this ‘basic’ skill cannot be underestimated among anaesthetists. Equipment for immediate neck access was made immediately available as soon as intubation was unsuccessful. Early cricothyrotomy rapidly restored gas exchange (SpO₂ fell to a minimum of 70%). Effective communication throughout between surgeon and anaesthetist ensured prompt decision-making and the outcome was ultimately successful.

Finally, it is our view that cases such as this should ideally be performed in ENT theatre, assuming safe patient transfer, with senior involvement and the availability for immediate airway rescue, including cricothyrotomy, tracheostomy or rigid bronchoscopy.

It is our view, and that of The National Airway Project (NAP4) scheduled to begin in September 2008, that cases such as this merit presentation and discussion. As anaesthetists, our exposure to ‘can’t intubate, can’t ventilate’ during a career is sparse and so learning from the experience of others is vital.
References

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