

Small

# THE HARDEST DENTAL EXTRACTION YOU'LL EVER DO....

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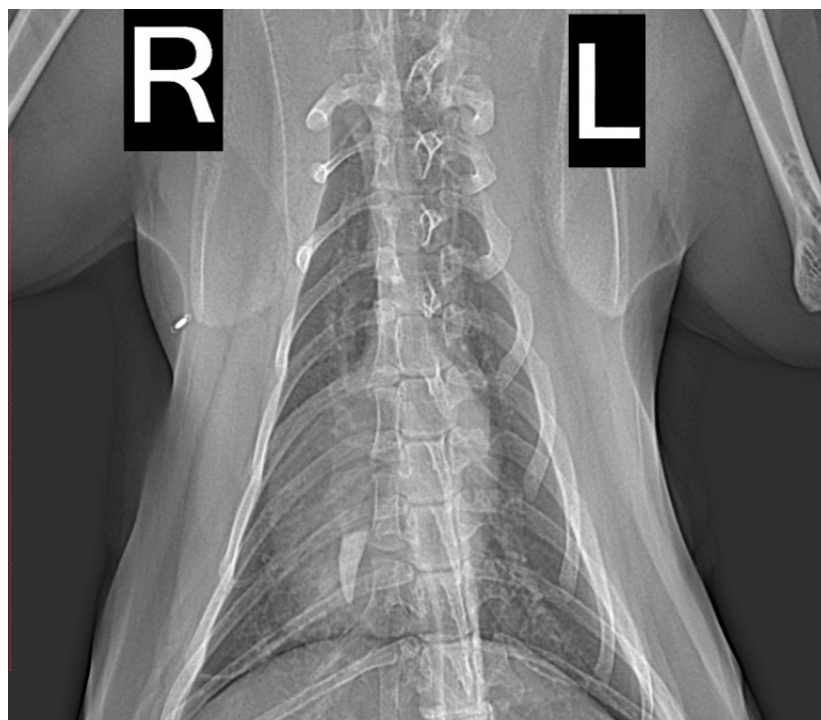
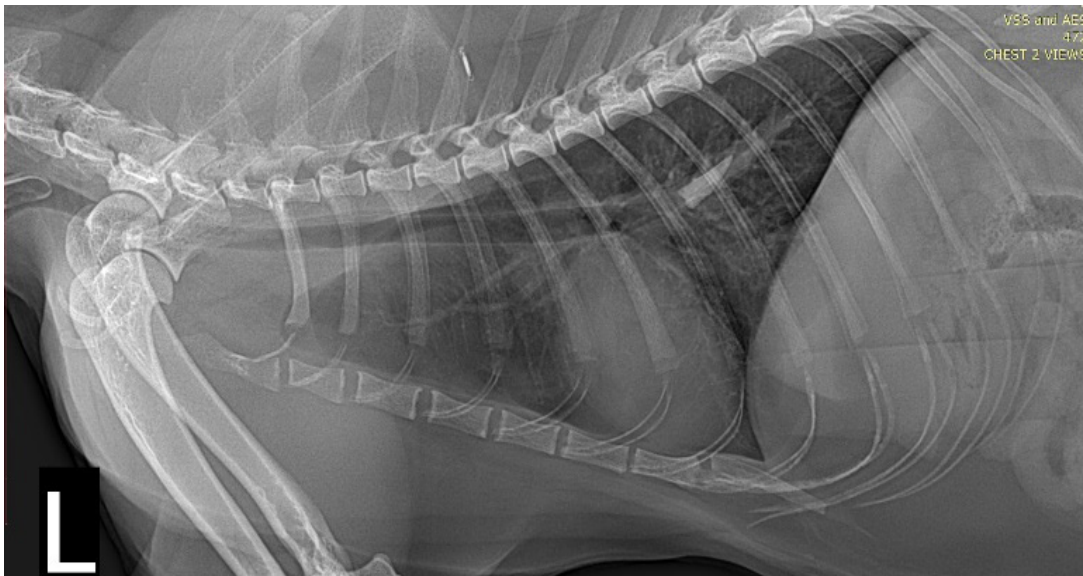
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Smudge is a 6-year-old Domestic Shorthair, indoor-only cat with no previous illness. Ten days ago, he fell off his balcony and the owner found him outside on the ground. He ate dinner that afternoon, but over the next 48 hours became progressively more lethargic and inappetant (highly out of character for him).

His owners brought him to the emergency services who identified a mild pyrexia and elevated respiratory rate (60) with a mild increase in expiratory effort.

The following radiographs were obtained resulting in a sharp intake of breath by all (including Smudge).

On closer inspection, Smudge was indeed missing his upper right canine tooth. Smudge was then referred for further management. After arrival, Smudge was placed in an oxygen cage and



Figures 1A and B. These radiographs demonstrate a well-defined mineral opacity superimposed on the right mainstem bronchus, most likely within the bronchial lumen. Importantly there is no evidence of pneumothorax or pneumomediastinum.

given further sedation (methadone 0.1 mg/kg intravenously).

Potential complications that may be associated with tracheobronchial foreign body removal can include pneumothorax and tracheal obstruction necessitating tracheostomy, so all necessary equipment to detail with these complications was set up prior to commencement.

Terbutaline (0.01 mg/kg IV) was given to reduce secondary bronchoconstriction and a conservative dosage of dexamethasone (0.05 mg/kg IV) administered to reduce secondary airway inflammation.

Midazolam (0.2mg/kg IV) was given at induction followed by alfaxalone by titration.

Radiographs were immediately repeated to ensure the foreign body was still in place (it was). The patient's hindquarters and caudal thorax were carefully elevated to try to dislodge the foreign body in a gravity dependent manne; however, no further movement was evident radiographically and this may well have been wishful thinking.

An ET tube was placed and then a Cook airway exchange catheter (8 French) was inserted into the ET tube to provide jet oxygenation into the left bronchus. The ET tube was removed and bronchoscopy commenced with the anaesthesia maintained via alfaxalone and midazolam total intravenous anaesthesia (constant rate infusions with boluses of alfaxalone given if required).

Bronchoscopy was performed using a flexible bronchoscope (Olympus, 5.5 mm insertion tube diameter, a 2 mm instrument channel, 600 mm working length).

The tooth foreign body was identified lodged in the bronchus of the right caudal lobe.

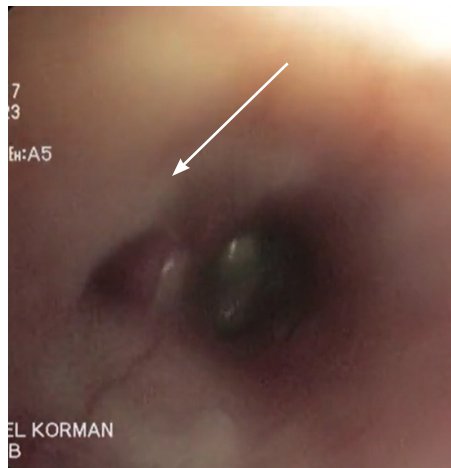


Figure 2. Arrow demonstrates mineralised FB lodged in the bronchi of the right caudal lobe

Attempts were made to grasp the tooth using retrieval baskets, a loop snare and alligator jaw grasping forceps but although a purchase could be made of the foreign body, there was no movement on retraction.

Close monitoring of the patient was maintained throughout the procedure using pulse oximetry, ECG, Doppler and rectal temperature.

If SpO<sub>2</sub> dropped below 90% the bronchoscope was removed and the patient re-intubated and further oxygen administered until oxygenation status improved.

A guide wire (Weasel Wire) was introduced through the bronchoscope which was then removed from the airway, leaving the weasel wire. Weasel Wires have hydrophilic technology and allow atraumatic passage into a body cavity of vessels to then facilitate passage of catheters or other devices.

An 8 French urinary foley catheter with an 8 mm bulb was then passed over the Weasel Wire, whilst currently instilling sterile saline over the guidewire to maintain the hydrophilic behaviour (it acts as a lubricant for the catheter). Attempts were made to pass the bulb of the catheter caudal to the foreign body under direct visualisation. The aim was to partially inflate the balloon behind the foreign body (FB) and then slowly advance the catheter to encourage mobility of the foreign body and draw it aborally.



Figure 3. CT of the patient following attempts at bronchial FB removal. The blue arrow highlights the tooth, while the red arrow demonstrates a pneumothorax in the right hemithorax with atelectasis associated with right caudal lung lobe.

Unfortunately, the catheter could not be passed caudal to the FB, as it was extremely well wedged within the bronchus. During the last of these attempts Smudge's oxygenation saturation dropped and after intubation remained around 90%. A CT was performed which revealed a pneumothorax. This was drained via thoracocentesis and the patient again stabilised. After discussion with the owner, thoracotomy was performed.

With gentle palpation the surgeon was able to identify the tooth within the right caudal lung parenchyma but still no movement of it could be encouraged. The site of the leak causing the pneumothorax could not be identified.

Right caudal lung lobectomy was performed.

A chest drain was placed (Mila 12 Fr) and Smudge was hospitalised for a further 72 hours. After 24 hours, the chest-drain was non-productive and was removed. Smudge received fentanyl for analgesia, mirtazapine as an appetite stimulant (he ate within 24 hours) and broad-spectrum antibiotics (amoxicillin 22 mg/kg IV q 8 hours and metronidazole 10 mg/kg IV q 12 hours). His recovery was uneventful and he was discharged with a short course of amoxicillin clavulanate for possible secondary infection from the FB and analgesia (buprenorphine and meloxicam oral suspension) as he was eating well.

Although uncommon, tracheobronchial foreign bodies occur in cats. As with most diseases feline, clinical signs are often vague and with cough being the most common presenting sign. In a recent review of 12 cats with tracheobronchial foreign bodies (Leal et al JFMS 2017) only 25% were presented for acute respiratory distress and the majority of cats showed clinical signs for over a week. Stridor was only found in cats with tracheal foreign bodies and wheezing with bronchial foreign bodies. This is probably because most of the foreign bodies are small and not obliterating the entire tracheal or bronchial lumen.

Reported foreign bodies in cats include mineralised material such as small pieces of bone (likely reflecting their nature as hunters),



Figure 4. The problematic tooth

teeth and vegetal material such as grass, bark and grass seeds. Vegetal material such as grass seeds have the potential for migration and subsequent pyothorax development. The shape of the tooth in Smudge's case likely encouraged a deeper migration into the bronchial tree.

In 12 cases of cats with tracheal FB, 10/12 were successfully removed using forceps and fluoroscopic guidance (Tivers et al JSAP 2006). Two of the 12 cats had the foreign body removed via bronchoscopy. All of these cats had their foreign body cranial to the carina.

In the case series of 12 cats with tracheobronchial foreign bodies (Lea et al JFMS 2017) 83% of cats had the foreign body successfully removed via bronchoscopy and 2/12 required a surgical approach after bronchoscopic removal was unsuccessful, similar to Smudge.

Another technique that could have been considered with Smudge was the passage of an arterial embolectomy catheter (e.g. Fogarty Fortis) such as those used in interventional techniques in human medicine to remove emboli and thrombi from arteries. Barium can be added to the catheter tubing to provide radiopacity under fluoroscopic guidance. The advance of this type of catheter over a Foley catheter would be the lower profile of the balloon and the longer length that would allow passage alongside or through the bronchoscope.

Tracheobronchial foreign bodies in cats are uncommon and not all cats demonstrate respiratory distress. Various techniques can be attempted for foreign body retrieval and if these are unsuccessful then partial lung lobectomy can result in a good outcome.◆



Figure 5. Smudge recovers post-operatively. Note a soft Elizabethan collar was removed prior to photography.