Ingestion of a Fixed Partial Denture During General Anesthesia

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Dental trauma during anesthesia is a common occurrence. Many patients have had extensive dental work, which is more fragile than the natural dentition. This work may include crowns, fixed partial dentures (bridges), and porcelain veneers. We report for the first time, a case in which a fixed partial denture became dislodged and was ingested, and was recovered postoperatively with endoscopy.

Key Words: Ingestion; Dental; Denture; Aspiration; General anesthesia.

CASE REPORT

The patient was a 46-year-old woman who presented for flexible bronchoscopy, biopsy, and possible rigid bronchoscopy to be performed under general anesthesia. She had a known history of mycobacterium lung infection (*Mycobacterium avium-intracellulare* [MAI]). Her medical regimen included clarithromycin, ethambutol, ciprofloxacin, and hydroxychloroquine. She was 152 cm tall and weighed 47 kg. She had no known allergies.

At the preoperative visit on the day of surgery, the patient pointed out that she had one loose crown. Her mandibular right first premolar was being held in place with a denture adhesive, so a dental consult was obtained preoperatively. No other loose dentition was noted by the dentist who removed the loose crown to prevent aspiration of it during the perioperative period. The patient had previously undergone a full mouth rehabilitation, including placement of numerous crowns and 2 fixed partial dentures. It appeared that intubation would not be difficult since her mouth opened 5 cm, the thyromental distance was 6 cm, and she was classified as a Mallampati Class 1 airway.

After anesthesia induction with propofol and succinylcholine, direct laryngoscopy with a #3 MacIntosh blade revealed a good view of the vocal cords, and the trachea was easily intubated with an 8.0 mm oral endotracheal tube. The intubation was atraumatic, and the

teeth were noted to be intact after intubation was completed. The endotracheal tube was secured with tape at the right corner of the mouth, and anesthesia was maintained with O₂, N₂O, sevoflurane, and a remifentanyl infusion. The surgeon performed flexible bronchoscopy and biopsy of the lung, and the procedure appeared to proceed uneventfully. The patient was awakened following the procedure and was extubated after meeting standard extubation criteria. The patient was then transferred to the phase-1 post anesthesia care unit (PACU). Following subsequent transfer to the phase-2 PACU, the patient complained that her right maxillary fixed partial denture was missing; the denture had been on the same side of her mouth that her endotracheal tube had been placed and taped. She was completely asymptomatic, without any dyspnea or coughing. Examination of the patient confirmed this finding. A chest radiograph was then taken, and it revealed that the denture had apparently been dislodged and appeared to be in the stomach (Figure). The patient agreed to endoscopy to have the dental prosthesis retrieved by a gastroenterologist, and this was successfully performed. The patient was contacted by our dental anesthesia services and was scheduled to return to have the bridge recemented. The patient had no other adverse sequelae from this event.

DISCUSSION

In a retrospective review of approximately 600,000 patients who had undergone anesthesia over a 10-year period, the incidence of dental trauma was 1 per 4537

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Figure 1. Chest radiograph demonstrating dental bridge in the stomach.

patients.¹ Dental injury was associated with difficult intubation and preexisting poor dentition. The most common injuries were fractures of crowns and partial dislocations. The teeth most commonly damaged were the maxillary incisors. The highest risk for dental trauma was associated with patients undergoing general anesthesia with endotracheal intubation who had preexisting poor dentition and who were difficult to intubate. Our patient did not have a difficult intubation, but did have a preexisting loose crown.

Although our patient had identified the one loose crown, which was removed preoperatively, there was a dislodgment of the fixed partial denture that was not identified as being loose during the preoperative visit. The denture was definitely not dislodged during the intubation since it was done atraumatically. It most likely occurred during the flexible bronchoscopy as a result of pressure being applied directly on the dentition or by the bronchoscope placing pressure to the endotracheal tube, which subsequently exerted excessive pressure on the denture. Substandard dental work or recurrent decay may have also contributed to the bridge becoming more easily loosened. The design of the bridge also made it more prone to loosening under pressure. Since the patient was missing her upper right second premolar, the fixed partial denture was a cantilever design. The pontic for the missing tooth was supported by crowning the upper right first premolar and canine. Pressure on the pontic could have created a levering effect that promoted loosening of the canine and premolar abutments during the bronchoscopy.

In a previous case report, a patient who had general anesthesia for cardiac surgery had postoperative dyspnea and coughing.² A chest radiograph on post-operative day 6 revealed that a dental prosthesis was in the right lung, and it was then retrieved with bronchoscopy. Our patient did not have any respiratory distress, so she did not appear to have aspirated the dental prosthesis based on a lack of clinical signs and symptoms. It was

important, however, to get a chest radiograph to positively identify whether it was still inside the patient. Had a single crown been ingested, it could have been allowed to pass through the intestines and could have been retrieved by examination of the feces to ensure that it had actually passed. Although the ingested fixed partial denture in our case may have passed through the intestines, the most prudent course of action was to retrieve it with endoscopy since it is possible that it could have caused an obstruction or even a perforation due to its relatively large size compared to a single crown.

In summary, this is the first report of an ingested fixed partial denture occurring during general anesthesia. It was retrieved uneventfully, and there were no adverse sequelae for the patient. It might be possible to prevent excessive pressure from being applied to the dentition by manually supporting the endotracheal tube during this procedure. Additionally, a dental guard could be inserted to protect the dentition if it appears to be at risk. Following the bronchoscopy, the dentition should be re-examined for possible damage.

If a tooth, crown, or fixed partial denture has been dislodged or avulsed and is not quickly recovered, it is important to obtain a chest radiograph to determine if the patient has aspirated it into the lung or whether it is in the stomach or even in some other anatomical location such as in the vallecula. Additionally, if more time has elapsed since the discovery of the missing object, an abdominal radiograph may be required to determine whether it has begun to pass through the intestines. It is therefore important to make a timely decision whether to attempt endoscopy for ingested objects before they pass far enough to make retrieval difficult or impossible. A single crown or tooth could be permitted to pass through the intestines unless there are sharp edges or there exist mesial and distal rests, clasps, or attachments on a single tooth pontic that could possibly harm the intestinal wall if not retrieved. Although there are no guidelines to help make the decision as to whether to let the object pass or to retrieve it, it is prudent to consider retrieving a fixed partial denture containing multiple units, as it appears that there could be increased risk causing intestinal damage or bowel obstruction from unsuccessful passage of the object.

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