Removal of a Partial Denture from the Esophagus with the Aid of an Endoscope

Marcia S. Campos, DDS, PhD[a]/Fabio D. Nunes, DDS, PhD[b]/Renato Soares Godoy, MD, MSc[c]/Laerte Rodrigues Júnior, MD[d]/Elio H. Shinohara, DDS, PhD[e]

Swallowed prostheses have been described in the literature, and in some cases, the diagnosis can be challenging, especially if the partial or complete denture is metal-free. This article presents a case of a swallowed partial denture and points to the importance of early diagnosis. A man was admitted to the emergency room complaining of progressive breathing difficulty while presenting with an extra volume in his neck. After inconclusive image examinations, endoscopy under sedation was used to identify and retrieve the foreign object, which was a metal-free acrylic partial denture. Early diagnosis and the correct treatment can avoid serious sequelae, such as edematous reactions, mucosal infection, and necrosis. Patients should be scheduled for regular recall visits for evaluation of prosthesis fit and retention, condition of the abutments, and nocturnal wear. *Int J Prosthodont 2010;23:339–341.*

Dental professionals use small instruments in the oral cavity such as burs, endodontic files, rubber dam clamps, wedges, and impression and restorative materials. In this context, the literature has reported on foreign bodies of dental origin reaching air and food passages by accidental swallowing or aspiration.[1] Similarly, during clinical examination, dentists have faced the presence of foreign bodies in the upper airway in asymptomatic patients, and this could pose an additional risk during oral surgeries.[2]

Particularly in cases of swallowed or inhaled dentures, different fabrication materials used to make a complete or partial denture can produce radiolucent images, which can cause a delay in diagnosis and treatment.[3–8]

[a]*Assistant Professor, Department of Oral Pathology and Diagnosis, School of Dentistry, University of Taubaté, Taubaté, SP, Brazil.*
[b]*Associate Professor, Department of Oral Pathology, School of Dentistry, Universidade de São Paulo, São Paulo, Brazil.*
[c]*General and Trauma Surgeon, Emergency Service, Conjunto Hospitalar do Mandaqui SUS, São Paolo, Brazil.*
[d]*Trauma Team, Conjunto Hospitalar do Mandaqui SUS, São Paolo, Brazil.*
[e]*Assistant Professor, Department of Oral and Maxillofacial Surgery, School of Dentistry, University of São Paulo, São Paulo, Brazil.*

Correspondence to: *Marcia Sampaio Campos, Department of Oral Pathology and Diagnosis, School of Dentistry, University of Taubaté, Av. dos Operários, 9-Centro-12020-330, Taubaté, SP, Brazil. Fax: +55 (12) 36324968. Email: mscamp30@gmail.com*

Based on this, what is the best approach for identifying a suspected foreign body in a patient's esophagus? Under suspicion, the case should be investigated by obtaining both anteroposterior and lateral radiographs. This would be beneficial not only for the reasons of variable radiopacity dependent on orientation, as previously mentioned, but also to give a better idea of the anatomical location of the foreign matter. The disadvantages include increased radiation exposure since two radiographic examinations should be done.[9] Despite its controversial nature, the use of multiple radiographic investigations can be helpful in these cases,[9] but most importantly, the procedure used to perform these examinations should suit the particular case and use the available equipment.

This paper reports a case of removing a partial denture from the esophagus of a patient with the aid of an endoscope.

Case Report

The case reported here is in accordance with the ethical principles of the Declaration of Helsinki and was reviewed and approved independently by an internal institutional ethical board. A man was referred to the emergency room, Conjunto Hospitalar do Mandaqui, complaining of breathing difficulties and an extra volume in his neck (Fig 1). A multidisciplinary team, including dental clinicians and head and neck surgeons,

Fig 1 Clinical aspect of the discrete volume located in the neck of the patient *(arrow)*.

Figs 2a and 2b **(left)** Anteroposterior and **(right)** lateral radiographs of the neck region showing a radiolucent foreign body *(arrows)*.

Fig 3 *(left)* Surgical removal of the partial denture.

Fig 4 *(right)* The metal-free partial denture recovered after the surgical procedure.

was available to assist with the diagnosis and treatment. The oral examination, performed by the dental clinicians, revealed that the patient was partially edentulous and had no current dentures. According to the patient, his partial denture disappeared during the night before the signs of discomfort and expiratory wheezing began. Under suspicion of a swallowed denture, anteroposterior and lateral radiographs of the neck were obtained, showing inconclusive results (Figs 2a and 2b). The foreign body, a metal-free acrylic partial denture, was then identified and removed under sedation using an endoscope (Figs 3 and 4). The patient was discharged the same day.

Discussion

The medical and dental literature provide 30 articles from 1990 to 2008 that report on cases of inhaled peanuts, [10] dentures,[11,12] and accidental swallowing or aspiration of dental instruments.[3–8] In these cases, the implications for clinical practice include the recognition of risk that dental therapy incurs in regard to the airway and posterior pharynx.[8] In addition, documentation and follow-up of adverse outcomes and the use of preventive measures such as rubber dams, gauze throat screens, or floss ligatures need to be considered.[8] Early diagnosis and treatment could prevent the edematous reaction, mucosal infection, and necrosis that increase the risk of a rigid esophagoscopy.[13] Reported late complications of an undiagnosed swallowed denture include extraluminal migration from the esophagus, causing diverticulum[14] or perforation.[15] In addition, immediate complications such as acute airway obstruction, hypoxia, and chronic complications (ie, esophageal erosion and pneumonia) represent serious medical issues that require further care and hospitalization.[6] At a later stage, the foreign body may mimic chronic inflammatory diseases such as sinusitis,[16] while objects inserted in the nose promptly cause local inflammation, leading to an increase in mucosal thickness and an excessive production of mucus that covers the object, making it slippery.[17]

Management of swallowed dentures can be challenging, even when the diagnosis is straightforward. If there is suspicion of a foreign body in the airway, radiographic and tomographic examination should be obtained initially. Although a simple radiograph may not identify a swallowed denture, the investigation is recommended to exclude pneumomediastinum or gas within the soft tissues.[5] Additionally, acrylic dentures are more likely to be discernible by computed tomography, since the process is more sensitive to small changes in radiographic attenuation than by plain radiography.[3,4] Magnetic resonance imaging (MRI) can also show foreign bodies, although it may be difficult to gain access to MRI equipment in an emergency situation. Another instrument that can be used to localize the position of metallic foreign bodies is portable metal detectors.[18] In all cases, the availability of the equipment is crucial to determine the best option for each individual case. In situations of perforating objects, the extent of the damage should be determined due to the proximity of important anatomical structures; angiography of the region should be requested if necessary.[19]

In the case reported here, the diagnosis was particularly difficult because the swallowed partial denture was metal-free and therefore could not be identified in the radiographic examination. Thus, extra time had to be spent for the swallowed object to be identified and removed, leading the patient to present initial signs of mucosal irritation without evident bleeding. The major lesson learned from the present case is that a denture does not have to be small to be swallowed. Moreover, foreign bodies may be present in the upper airway without causing immediate symptoms.[10] Based on this, an early challenge is posed for the practitioner who has limited information to guide the diagnostic process. If it is observed that there are some natural teeth missing, the possibility of a swallowed denture should be included in the differential diagnosis. For this reason, checking over the dentures and undertaking necessary maintenance should be part of the regular dental recall process. It is quite obvious that the patient would eventually realize that his partial denture was missing and that he may have swallowed it. However, even during the first examination, the patient did not report any suspicion of this, which added to the difficulty of the diagnostic process. This points to the fact that, apart from the risk of swallowing the denture (and for reasons of overall dental health), patients should be advised not to wear their dentures at night.

Conclusion

This case report aimed to familiarize practitioners with the risks, diagnostic regimens, treatment protocols, and preventive measures for swallowed or inhaled objects. The key to early recognition is being aware of the potential hazard by denture wearers and practitioners.

Acknowledgment

The authors would like to thank Kristy Warner for the linguistic support.

References

1. Tamura N, Nakajima T, Matsumoto S, Ohyama T, Ohashi Y. Foreign bodies of dental origin in the air and food passages. Int J Oral Maxillofac Surg 1986;15:739–751.
2. Tay AB. Long-standing intranasal foreign body: An incidental finding on dental radiograph: A case report and literature review. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2000;90:546–549.
3. McLaughlin MG, Swayne LC, Caruana V. Computed tomographic detection of a swallowed denture. Comput Med Imaging Graph 1989;13:161–163.
4. Newton JP, Abel RW, Lloyd CH, Yemm R. The use of computed tomography in the detection of radiolucent denture base material in the chest. J Oral Rehabil 1987;14:193–202.
5. Nageris B, Feinmesser R. Dentures in the esophagus complicated by pneumomediastinum. Ear Nose Throat J 1990;69:775–776.
6. Fields RT Jr, Schow SR. Aspiration and ingestion of foreign bodies in oral and maxillofacial surgery: A review of the literature and report of five cases. J Oral Maxillofac Surg 1998;56:1091–1098.
7. Hashmi S, Walter J, Smith W, Latis S. Swallowed partial dentures. J R Soc Med 2004;97:72–75.
8. Tiwana K, Morton T, Tiwana PS. Aspiration and ingestion in dental practice: A 10-year institutional review. J Am Dent Assoc 2004; 135:1287–1291.
9. Weller MD, Ayshford CA. Variable radio-opacity of a metallic foreign body. Emerg Med J 2004;21:638–639.
10. Leong SC, Farook KS. Peanut aspiration in an adult. Prim Care Respir J 2004;13:169–170.
11. Neustein S, Beicke M. Ingestion of a fixed partial denture during general anesthesia. Anesth Prog 2007;54:50–51.
12. Knowles JE. Inhalation of dental plates—A hazard of radiolucent materials. J Laryngol Otol 1991;105:681–682.
13. Nandi P, Ong GB. Foreign body in the oesophagus: Review of 2394 cases. Br J Surg 1978;75:5–9.
14. Olak J, Jeyasingham K. Cervical esophageal diverticulum associated with an impacted denture: A case report. Can J Surg 1991;34: 614–617.
15. Treska TP, Smith CC. Swallowed partial denture. Oral Surg Oral Med Oral Pathol 1991;72:756–757.
16. Burduk PK, Garstecka A, Betlejewski S. Nasal foreign body in an adult. Eur Arch Otorhinolaryngol 2005;262:517–518.
17. Kumar S, Kumar M, Lesser T, Banhegyi G. Foreign bodies in the ear: A simple technique for removal analysed in vitro. Emerg Med J 2005;22:266–268.
18. Gooden EA, Forte V, Papsin B. Use of a commercially available metal detector for the localization of metallic foreign body ingestion in children. J Otolaryngol 2000;29:218–220.
19. Takasaki K, Enatsu K, So E, Takahashi H. Fifty-four wooden toothpicks in the nasal cavity. Otolaryngol Head Neck Surg 2005; 132:669–670.