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Implant screwdriver aspiration during dental procedure at a geriatric patient: a case report

Geriatrik hastada dental uygulama esnasında implant anahtarının aspirasyonu: vaka raporu

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ABSTRACT

The aim of this case report is to present a geriatric patient who had aspirated an implant screwdriver. An 82-year-old male patient involuntarily closed his mouth during the healing cap placement phase of implant treatment, and the implant screwdriver disappeared through the pharynx. As the patient exhibited no signs of airway obstruction, it was considered that the implant screwdriver might have passed into the gastrointestinal tract. However, no foreign object was detected in the esophageal mucosa. Therefore, the procedure was repeated using C arm fluoroscopy for guidance. The examination revealed the presence of the implant screwdriver in the bifurcation of the left lower lobe bronchus, which was confirmed by posterior-anterior chest radiography. The following day, the patient underwent a flexible bronchoscopy, however the screwdriver could not be retrieved during the procedure. Further treatment was refused by the patient. After one month, the implant screwdriver was expelled through the gastrointestinal tract. At the three-year follow-up, there was no evidence of a late complication. Aspiration of screwdrivers and treatment failures of these complications are reported a small number of cases in the geriatric patients. Therefore, documentation of the rare cases is necessary to provide valuable information.

Keywords: Geriatric dentistry; implant screwdriver; aspiration; fluoroscopy; bronchoscopy.

ÖZ

Bu vaka raporunun amacı, implant anahtarını aspire etmiş geriatrik bir hastayı sunmaktır. Seksen iki yaşında erkek hasta, implant tedavisinin bir aşaması olan iyileşme başlığının takılması esnasında istemsizce ağzını kapatmış ve implant anahtarı farinkse doğru yer değiştirmiştir. Hastada hava yolu tıkanıklığı bulguları olmadığı için, implant anahtarının gastrointestinal yolağa doğru hareket ettiği düşünülmüştür; ancak özefageal mukozada yabancı cisim saptanmamıştır. Bu nedenle, uygulama C arm floroskopi rehberliğinde tekrarlanmıştır. Değerlendirmede implant anahtarının sol alt lob bronş girişinde olduğu düşünülmüştür ve bu bulgu, posteroanteriyor göğüs radyografisi ile doğrulanmıştır. Takip eden günde, hasta fiberoptik fleksibl bronkoskopiye alınmıştır; ancak implant anahtarı çıkartılamamıştır. İmplant anahtarının çıkarılmasında yaşanılan başarısızlıktan dolayı, hasta tarafından ileri tedaviler reddedilmiştir. Bir ay sonra, implant anahtarı gastrointestinal yolaktan atılmıştır. Üç yıllık takipte, geç dönem komplikasyon ile karşılaşılmamıştır. Geriatrik hastalarda, implant anahtarının yutulması ve bu komplikasyonun tedavisindeki başarısızlıklar az sayıda vaka raporunda bildirilmiştir. Bu nedenle, bu nadir vakaların belgelenmesi, faydalı bilgilerin sağlanması açısından gereklidir.

Anahtar Sözcükler: *Geriatrik diş hekimliği; implant anahtarı; aspirasyon; floroskopi; bronkoskopi.*

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INTRODUCTION

Aspiration and ingestion of foreign objects are potential clinical complications during dental procedures such as implantation, tooth extraction, root canal therapy, and even routine examination (1). These complications are more prevalent in pediatric and geriatric populations due to medical or mental conditions of the patients, difficulties of access, or the use of intravenous sedation or local anesthesia (1-3). Clinical signs and symptoms, such as choking, coughing, bruising, and acute dyspnea, can vary in accordance with the size, shape, type, and location of foreign objects as well as the length of time before retrieval (2). These aspirated and ingested objects may be located in any area of either the respiratory or the gastrointestinal tract (1-5).

The aim of this case report is to document a patient who aspirated an implant screwdriver in the course of dental treatment. The importance of the knowledge regarding such complications with respect to both the further examination of the patients and consultations with relevant physicians is presented. The reported case also highlights some deficiencies which may occur during the bronchoscopic intervention.

CASE PRESENTATION

An 82-year-old male patient presented to the Department of Oral and Maxillofacial Surgery at the University Dental School for dental implant treatment. The patient's medical and dental histories were received, and he signed an informed consent form before the clinical examination. Dental implant surgery was performed immediately after the maxillary second molar tooth had been extracted. At postoperative 6th month a research assistant with one year of clinical expertise administered the healing-cap as the second stage of the surgery. On the day of the procedure, the patient was placed in the dental chair in a semi-supine position, and local anesthesia was administered using 2% lidocaine with 1:80,000 epinephrine (1/200.000 Jetokain®, Adeka, İstanbul, Turkey). The cover screw was removed, and the healing cap was transferred to the implant screwdriver. As the healing cap was being placed, the patient involuntarily closed his mouth and, the screwdriver fell into the oral cavity. During the attempt to retrieve the object using forceps, the implant screwdriver disappeared through the pharynx.

The patient was immediately instructed to sit upright and asked to try to cough repeatedly. A detailed examination of the oral cavity was carried out to check whether the object was wedged in the submucosal region, but this was found not to be the case. As the patient exhibited no symptoms or signs of airway obstruction, such as wheezing, difficulty breathing, or chest pain, it was considered that the object might have passed into the gastrointestinal tract. The patient was referred to the Emergency Department of the University Medical School, where an upper gastrointestinal endoscopy was performed to locate the object. However, no foreign object was detected in the esophagus or duodenal bulb. Therefore, the procedure was repeated using C arm fluoroscopy for guidance. The examination revealed the presence of a radiopaque foreign object in the bifurcation of the left lower lobe bronchus, and this was confirmed by posterior-anterior chest radiography (Figure-1). The patient was transferred to the Department of Thoracic Surgery for further management. A decision was made to carry out a non-surgical removal of the aspirated object using a bronchoscopic approach. The next day, the patient underwent a flexible bronchoscopy. Forceps were used to grasp the object, which was then pulled back through the trachea under fluoroscopy. However, the foreign object made contact with the epiglottis in the course of the removal, causing the patient to cough. This in turn resulted in the expectoration of the screwdriver into the esophagus. Having failed to retrieve the object, the patient was referred for consultation with gastroenterologists. A diagnostic endoscopy revealed that the foreign object was now located in the right upper segment of the abdomen, but when the patient's family was informed of this unexpected complication, further treatment was refused. The patient was discharged on the postoperative second day.

After one month, the screwdriver was expelled through the gastrointestinal tract. At the three-year follow-up, there was no evidence of inflammation and of any late complication of foreign object aspiration.

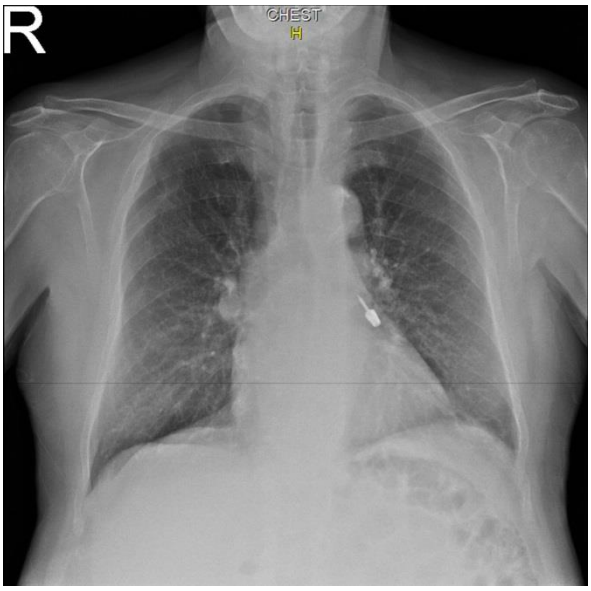

Figure-1. A posterior-anterior chest radiography showing aspirated screwdriver in the left basal bronchus.

DISCUSSION

This case report describes the diagnosis and treatment attempt of a patient who aspirated a screwdriver during dental implant treatment. Such complications can result from the physician's lack of experience or a number of other factors regarding the treatment.

The prevalence of these complications increases in cases involving young children and, more particularly, elderly patients (1-3). As a preventive method in clinical practice, patients are given specific preoperative instructions about the risks of instruments falling into their mouths (3). However, these patient populations may exhibit emotional distress, decreased gag reflexes and palatal mucosa sensitivity related to the foreign objects, uncoordinated swallowing, or other deformations of the airways that can affect the normal defensive reflexes (1). It is important that all necessary preventive measures are taken in the treatment of these patients, including arranging short appointments in early hours, making optimal use of auxiliary equipment and materials, such as ligatures, gauze screens, or throat packs for removal of prostheses prior to starting the dental procedures, adjusting the dental chair to a more upright position, ensuring the appropriate instruments are selected for each procedure, and, where possible, using experienced, highly-trained dental assistants (1-5).

In the case presented here, the procedure was performed by a research assistant with one year of experience, not by the oral surgeon who had carried out the implant surgery. This may be considered as a significant contributory factor.

Most aspirated foreign objects have been reported to be in the right bronchial tree, while there are very few reports in the literature of foreign objects located in the left bronchus (2, 6). In addition, the published cases that are associated with aspiration of screwdrivers are limited in the literature (7). Aspirated screwdrivers or screwdrivers with healing abutments were reported to be in the right lung except in one case (8). This predominance of the right bronchus can be explained by the greater diameter and less acute angle of the right bronchus than of the left bronchus (2). In the case presented here, the aspirated screwdriver was observed at the entrance of the left lower lobe bronchus.

In similar cases, the clinical symptoms can be non-specific, especially in geriatric populations. Lin et al. (5) reported that the symptoms can be variable, and the "classical triad" of choking, coughing, and wheezing is only observed in a small percentage of patients. Cossellu et al. (3) and Bergermann et al. (4) also reported patients who showed no signs of aspiration or respiratory distress.

In accordance with the literature, there were no significant symptoms of airway obstruction in presented case. Since this condition can lead to misdiagnosis about location of the foreign object in geriatric patients (5), auxiliary diagnostic methods are required to ensure thorough and accurate examination. While diagnostic endoscopy or bronchoscopy are generally offered as the preferred options, radiological assessments should be considered to assist physicians in determining the locations of the foreign objects.

The treatment approach for foreign object aspirations, as reported in the literature, involves the use of flexible or rigid bronchoscopy to prevent airway obstruction or life-threatening conditions. Hewlett et al (6) stated that rigid bronchoscopy allows for greater protection against the sharp features of foreign objects. Similarly, Batra et al (9) argued that, in spite of significant advances in flexible bronchoscopy, rigid bronchoscopy remains the more effective method for management of aspirated foreign objects.

In addition, the presence of granulation tissue with mucosal inflammation and edema is a condition that hampers the treatment for removal of foreign objects (1, 10). Therefore, early interventions are needed to avoid the formation of granulations and increase the success rates of the treatment (1).

Although the removal of the aspirated screwdriver was carried out as quickly as possible in the case presented, the failed bronchoscopic retrieval is reported. Flexible bronchoscopy may be an option as a treatment for retrieving aspirated objects, but the use of rigid bronchoscopy is preferable for the removal of sharp objects, to reduce the possibility of undesirable consequences.

Post-obstructive pneumonia, bronchiectasis, and lung abscess are the most common complications of foreign object aspiration. When asymptomatic patients are followed up, further examination should be carried out in cases where fever, sputum, or increases in infection parameters are observed. In the case reported here, there was no evidence of a late complication of foreign object aspiration at the three-year follow-up.

CONCLUSION

Aspiration of foreign objects is a potential hazard in many dental and medical procedures. It is necessary for physicians to know about the potential for such complications, how to prevent them, and also, should such incidents occur, how to facilitate the right treatment approach to minimize emotional distress and ensure the cooperation of the patients. Therefore, documentation of these incidents is necessary to provide valuable information.

Competing interests: The authors declare that they have no competing interests.

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