

Transcervical migration of a broken dental needle: a case report and literature review

Mehmet Ali Altay, DDS, PhD,^a Diana Jee-Hyun Lyu, DMD,^b David Collette, DMD, MD,^c Dale A. Baur, DDS, MD,^d Faisal A. Qureshy, MD, DDS,^e Sorin T. Teich, DMD, MBA,^f and Ariadne E. Gonzalez, BS^g

Akdeniz University, Antalya, Turkey; Case Western Reserve University and University Hospitals/Case Medical Center, Cleveland, OH, USA; University of Minnesota, Minneapolis, MN, USA

Although needle breakage is a rare event in dentistry, the occurrence can cause significant distress to the patient and the clinician. Taking appropriate measures to prevent this mishap is best. However, when this event occurs, appropriate planning and retrieval of the needle can lessen the detrimental effects. In this report, we document the migration and retrieval of a broken dental needle that traveled from the medial ramus of the mandible to the posterior cervical space. This report emphasizes the importance of proper local anesthesia techniques, as well as preventive measures, localization methods, and the principles of surgical approaches for the removal of broken needles. (Oral Surg Oral Med Oral Pathol Oral Radiol 2014;118:e161-e165)

In dentistry, needle breakage during the administration of local anesthesia is rare but also is a serious event. The introduction of disposable needles, scientific advances in metal alloys, and developments in the techniques of the delivery of local anesthesia have contributed to the reduction in the number of needle breakage cases.^{1,2} In 1924 Blum³ reported 65 cases of broken needles in a 10-year period. Although it is uncommon today for a needle to break during the administration of local anesthesia, needle breakage continues to occur and is usually due to preventable reasons such as improper technique or using the

incorrect needle. Management of a broken needle can be challenging and result in complications including migration of the needle to deep cervical spaces and injury of surrounding anatomic structures including vasculature or nerves.^{4,5}

Augello et al.⁶ reported that out of 34 articles published in the past 50 years, a total of 64 cases of needle breakage were encountered; of those cases, 45 (70%) occurred during inferior alveolar nerve blocks. In a cadaver study, Kronman et al.⁷ found that a needle has to penetrate about 21 mm deep into the soft tissue to reach the mandibular foramen for adequate anesthesia. In another study, Okamoto et al.⁸ found that the needle should be inserted between the muscle tendons of the temporalis muscle and the medial pterygoid muscle directly into the pterygomandibular space for optimal anesthesia. However, in the majority of cases, the needle penetrates into more dense, bulky structures such as the medial pterygoid muscle or the tendon of the temporalis muscle. Tissue resistance is higher in these areas and increases even more when the mouth is opened maximally, which can cause the needle to break.⁸ Other sites of anesthesia administration with reported incidences of needle breakage were on the lingual and buccal mandible, the maxilla buccal areas, and intraosseous areas.⁶ Needle breakages can occur if there is an unexpected movement of the patient during administration, incorrect technique, overmanipulation of the needle (causing bending), incorrect choice of needle gauge, or a combination of those.⁵⁻¹⁰ The authors have had 3 cases of broken needles referred to them for management in the past 4 years. In each of these cases, it was a 30-gauge needle being used for a mandibular block.

Different techniques for the localization of needle fragments in the head and neck region have been described.² Although most cases reported the use of conventional radiographs, there has been a shift to using computed tomography (CT) scans over the past

Disclosure: Dr Baur is a consultant to Novartis Pharmaceuticals and Checkpoint Surgical LLC.

^aDoctor of Oral and Maxillofacial Surgery, Akdeniz University, Faculty of Dentistry, Antalya, Turkey; Research Fellow, Department of Oral and Maxillofacial Surgery, Case Western Reserve University School of Dental Medicine.

^bFormer Intern, Department of Oral and Maxillofacial Surgery, Case Western Reserve University School of Dental Medicine; Resident, Department of Oral and Maxillofacial Surgery, University of Minnesota School of Dentistry.

^cFormer Resident, Department of Oral and Maxillofacial Surgery, Case Western Reserve University School of Dental Medicine; Private practice, Albuquerque, NM, USA.

^dAssociate Professor, Chair, and Division Chief, Department of Oral and Maxillofacial Surgery, Case Western Reserve University School of Dental Medicine and University Hospitals/Case Medical Center.

^eAssociate Professor and Residency Program Director, Department of Oral and Maxillofacial Surgery, Case Western Reserve University School of Dental Medicine and University Hospitals/Case Medical Center.

^fAssociate Dean of Clinical Operations, Case Western Reserve University School of Dental Medicine.

^gResearch Assistant, Department of Oral and Maxillofacial Surgery, Case Western Reserve University School of Dental Medicine.

Received for publication Mar 23, 2014; accepted for publication Apr 3, 2014.

© 2014 Elsevier Inc. All rights reserved.

2212-4403/\$ - see front matter

<http://dx.doi.org/10.1016/j.oooo.2014.04.001>

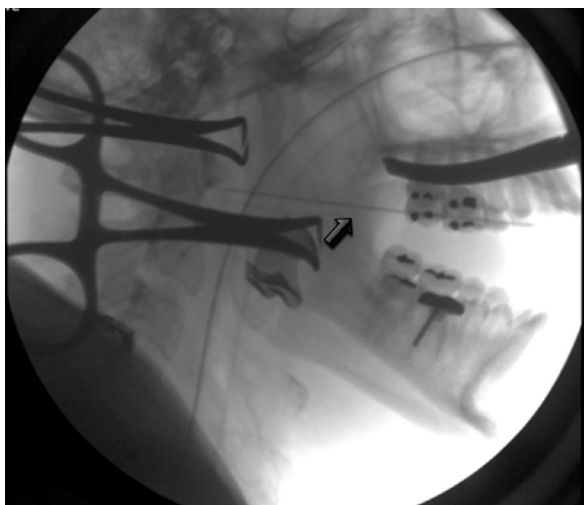


Fig. 1. The radiographic intraoperative image obtained with C-arm fluoroscopy. The arrow is pointing at the spinal needle, used as a reference. A faint image of the broken needle is seen just inferior to the spinal needle and just superior to the towel clamp.

10 years. This provides better localization in the coronal, axial, and sagittal planes. Other reported methods to access the site and locate the needle include the use of metal detectors or magnets, reference needles and C-arm with fluoroscopic detection, and image-guided surgery. Fluoroscopic imaging is regarded as an ideal visualization method for needle retrieval, owing to its rapid collection and review of images at different views intraoperatively, reduction of radiation dose by use of intensifiers, and excellent image quality.⁹⁻¹⁴ An image obtained with C-arm fluoroscopy to aid in the locating of a broken dental needle is seen in [Figure 1](#).

There have been several case reports of needle retrieval procedures and differences in opinions as to how broken needles should be managed. Many authors have suggested the removal of a broken needle to prevent pain, trismus, infection, migration, or any combination of those. Malamed¹⁵ and others have recommended leaving the needle fragment as long as the patient is not symptomatic.^{10,15,16} The lack of consensus seems to arise from the unpredictability of trajectory and time course, as well as the infrequency of this complication. However, it is obvious that if there are symptoms that are not alleviated by conservative treatments, it would be necessary to attempt removing the needle. Needle removal is also often warranted for the patient's emotional and psychological well-being.

The aim of this report is to provide the clinician awareness of this complication that can occur during the administration of local anesthetic and to specifically review the prevention and management of needle breakage.

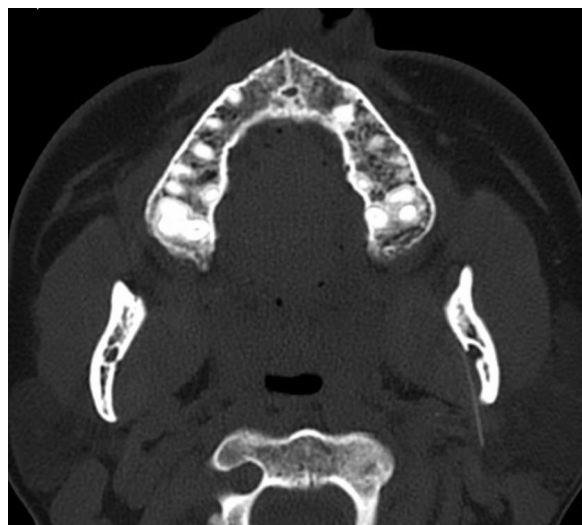


Fig. 2. The computed tomographic image of the fragment of the needle located medial to the left mandibular ramus.

CASE REPORT

A 34-year-old woman was referred to Case Western Reserve University School of Dental Medicine, Department of Oral and Maxillofacial Surgery, for evaluation of a broken needle. The patient reported breakage of a needle during a dental procedure on the left side of her lower jaw. When this occurred, she was immediately referred to a hospital emergency department (ED), where a CT scan was obtained. The Oral and Maxillofacial Surgery service was contacted that night by the ED physician by telephone. The patient was seen several days afterward for assessment. Upon her presentation, she complained of decreased mouth opening and pain.

The patient's medical history was not significant. A physical examination was completed, demonstrating a limited mouth opening of 10 mm. The CT imaging revealed the fragment of the needle, which was located medial to the left mandibular ramus, approximately 10 mm superior to the distal aspect of the left mandibular third molar ([Figure 2](#)).

The risk and benefits of having the needle surgically retrieved versus no treatment were thoroughly discussed with the patient. The patient was also advised that owing to the small diameter of the needle and the proximity of vital structures, there was a possibility that the needle would not be found. The patient chose to attempt to have the needle removed.

After nasotracheal intubation of the patient, a vertical incision along the ascending ramus to access the left pterygomandibular space was performed. A full-thickness mucoperiosteal flap was raised along the lingual aspects of the ascending ramus. Extreme caution was taken to identify the normal landmarks such as the sigmoid notch and the lingula. After the identification of these landmarks, both inferior alveolar and lingual nerves were protected during the entire duration of the procedure.

Further dissections were performed medially and posteriorly in the pterygomandibular space based on the CT scan, which showed the location of the needle. Initial attempts were unsuccessful in locating the fragment. At this point, an

Download English Version:

<https://daneshyari.com/en/article/6055648>

Download Persian Version:

<https://daneshyari.com/article/6055648>

[Daneshyari.com](https://daneshyari.com)