

## Case Report

# Removal of broken dental needle using mobile digital C-arm

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**Abstract:** Breakage of needles is one of the most frustrating and distressing complications of local anesthesia. It is also one of the easiest to prevent. This article describes the use of the C-arm digital fluoroscope for retrieval of a broken dental needle from the pterygomandibular space. (J. Oral Sci. 50, 351-353, 2008)

**Keywords:** digital C-arm; broken dental needle; pterygomandibular space.

## Introduction

Despite the introduction of new stainless steel dental needles, reports of needle breakage still occur (1,2). The most common site is the pterygomandibular area during inferior alveolar nerve blocks (2). Unexpected movement of the patient during anesthesia, use of inappropriate needles, repeated needle use, and redirection of the needle during anesthesia are the most common causes of needle breakage (3).

There is a degree of controversy over management of broken dental needles, but most authors suggest that the broken needles should be removed due to the potential danger for moving and hazards to vital structures (1). Various methods have thus been introduced for retrieving broken needles (1,2,4-6). This article describes the use of the C-arm intensifier for removal of a broken dental needle.

## Case Report

A healthy, well-developed 40-year-old male patient

with no significant problems in past medical history was accompanied by his dentist to a private office following an unsuccessful attempt to remove a broken dental needle in the right pterygomandibular area.

The needle had broken after the third injection for an inferior alveolar nerve block. The extraction was completed and the patient was informed about the incident.

The patient had no complaints immediately following the incident, but subsequently experienced mild pain at the injection site. Two days later, another dentist attempted to remove the needle, but pushed it deeper into the parotid space.

The patient complained of severe trismus (MMO < 10 mm) and pain, particularly while turning the head to the right. The patient's orthopantomograph showed the broken needle in the right pterygomandibular space (Fig. 1).

Because of toxic appearance and severe trismus, treatments such as hydration and antibiotics were initiated and CT scans in both the coronal and sagittal directions were obtained. CT scans showed a 4-cm sharp, radiopaque object in the right pterygomandibular space adjacent to the medial side of the mandibular ramus, which penetrated the

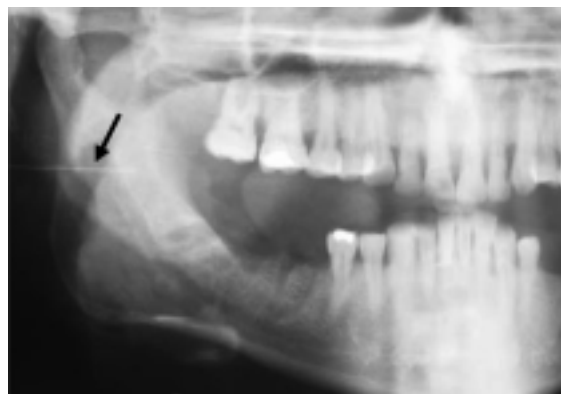


Fig. 1 Orthopantomograph showing broken needle (arrow).

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posterior muscular sling into the parotid tissue (Fig. 2).

Because of persistent pain and minimal improvement in general condition, the patient was scheduled to the operating room for removal of the needle under general anesthesia. The patient was placed on the operating table in supine position, and was anesthetized via a nasotracheal tube.

The mouth was kept open using a mouth probe. An 18 G spinal needle was inserted through the tissue, and a lateral image was obtained, (Mobile Digital C-Arm/ Series 7700, GE OEC Medical System, Salt Lake, UT, USA) (Fig. 3). A second needle was then inserted, and another image was taken (Fig. 4).

The area was carefully explored via a 4-cm mucosal incision over the approximate area by sharp and blunt dissection.

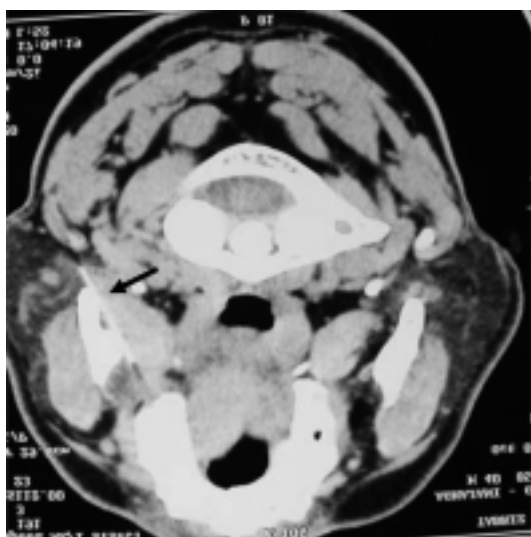


Fig. 2 CT scan demonstrating broken needle (arrow).



Fig. 3 Photograph of digital C-arm.

The needle was removed (Fig. 5) and the final postoperative view confirmed complete removal of the needle.

The area was sutured with 4.0 vycril after thorough rinsing with saline. The postoperative period was uneventful and the patient tolerated the treatment course very well. The patient was discharged from the hospital on the day after surgery, and continued to take antibiotics (Oral cephalosporin, 500 mg qid).

The patient visited once a week for one month postoperatively, and had no major complaints, other than mild pain in the retromandibular area, and mouth opening had increased to 35 mm.

## Discussion

Although the incidence of needle breakage during local anesthesia has been reduced, it remains a devastating experience for both the dentist and patient (3,7,8). Malamed identified the sudden unexpected movement of a patient,

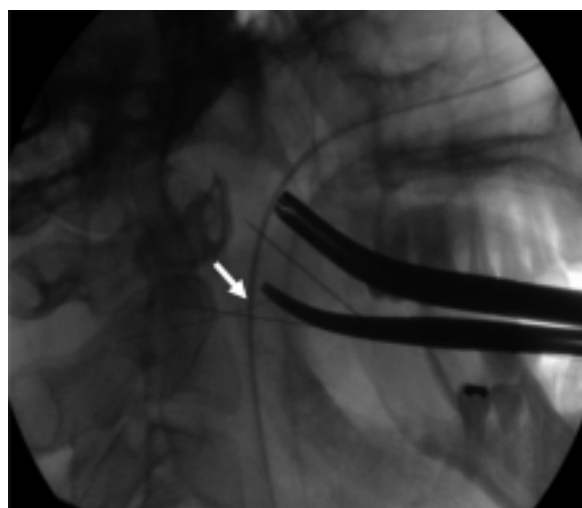


Fig. 4 Mobile digital C-arm view just prior to needle removal (arrow).



Fig. 5 Retrieved broken dental needle.

particularly in a direction opposite to that of the needle, as the primary cause of needle breakage (3). Any attempt to force or redirect the needle against tissue resistance while it is embedded in tissue is also a risk factor for needle breakage (3). In this case, according to both the patient and the dentist, there was no patient movement during anesthesia.

The dentist used a 40-mm 27 G needle three times for injection. A 27 G needle has been shown to be more difficult to direct properly through tissue because of its inherent weakness and flexibility (1). Needle fragility and susceptibility to breakage with repeated injections have also been documented (4,7).

Using fine and short needles for inferior alveolar nerve block demands the insertion of the needle up to the hub which is the weakest and most vulnerable part for breakage (3). In this case, the 40-mm dental needle was inserted up to the hub, which was the point of breakage. The main reasons for needle breakage in this patient were multiple insertions of a fine needle, and insertion of the needle up to the hub.

There remains a degree of controversy with regard to the removal of broken dental needles. Malamed recommends leaving the needle in tissue instead of attempting its removal (3). On the other hand, many other authors have suggested removal, citing the possibility of needle migration or infection (1,2,9). It is obvious that presence of active symptoms such as pain, trismus and infection that are not alleviated by standard treatments necessitate needle removal. Malamed (3) has presented an excellent description of the management of broken needles.

In this case, persistent trismus and pain indicated the surgical removal of the needle under general anesthesia. Manipulation of a foreign body without exact preoperative localization and standard surgical equipments could produce further complications and jeopardize patient condition. In this patient, trismus and pain had accrued following an unsuccessful attempt to retrieve the needle by a general practitioner.

Localization of a broken needle in the pterygomandibular space is very important, and several methods have been described in the literature (1,2,4-6,10). Preoperative radiographs using metal markers are the most common method. Despite its availability and ease, the technique is not sufficiently accurate because of the time period between obtaining the images and performing the surgery. In addition, taking and processing good intraoperative radiographs is difficult and time consuming. McDonogh has successfully used metal detectors in removing broken dental needles, but such devices are not readily available (5,6).

Use of the stereotaxy technique was introduced by Aryian for removing foreign bodies from extremities. Thompson et al. used this technique with an intensifier in two cases (1). C-arm fluoroscopy is widely used in orthopedics, and Cohen and Ma have successfully used mini C-arm units to detect and remove foreign bodies (10,11). In this case, we successfully used a C-arm digital fluoroscope to remove a broken dental needle. The rapid taking and immediate reviewing of images at various angles without disturbing the reference needle, reducing radiation dose by using intensifiers and excellent image quality are the advantages of this technique. Therefore, we recommend this technique for removing foreign bodies in the oral cavity.

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