Case Report

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# Serendipitous Retrieval of Needle Fragment during Marginal Mandibulectomy Defect Rehabilitation

**Abstract:**
Needle breakage during dental anesthesia is a rare complication with distressing implications. This case report highlights the incidental retrieval of the needle fragment from marginal mandibulectomy defect, emphasizing the importance of awareness, prevention, and effective management of this rare complication.

**Key-words:** Needles, Syringe, Rehabilitation, Dental Prosthesis, Mandible

## Introduction:

Needle breakage is a relatively rare occurrence during dental anesthesia procedures. Although distressing for both patients and clinicians, it often goes unreported. Fortunately, the introduction of disposable stainless-steel needles in the 1960s has significantly reduced the incidence of such incidents.[1]

Several factors can contribute to needle breakage, including improper technique, sudden patient movement, needle pre-bending, using shorter and smaller gauge needles, needle reuse, changes in needle direction, and manufacturing defects.[2]The symptoms and consequences associated with needle breakage can vary depending on the location of the foreign body and its proximity to anatomical structures. There is also a risk of needle migration and potential injury to vital structures.

In the maxillofacial region, needle breakage can manifest as either asymptomatic or symptomatic, leading to pain, infection, neck tenderness, throat soreness, trismus, dysphagia, odynophagia, voice changes, referred otalgia, intermittent neck twitching sensations, and psychological trauma.[3] The literature also mentions the further complication of needle migration,[4] emphasizing the importance of accurate localization of the thin radio-opaque metal fragment.

Conventional radiographic techniques such as panoramic views, posterior-anterior skull views, and, lateral skull views are commonly used for initial evaluation. However, for better three-dimensional localization, multi-slicecomputed tomography (CT) is recommended.[5]

This case report highlights the infrequent but significant complication management of retrieval of a needle fragment from a marginal mandibulectomy defect. By raising awareness of such incidents, clinicians can be better prepared to prevent needle breakage and manage its consequences effectively.

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## Case Report:

A 50-year-old man visited the Prosthodontics Department at the Government College of Dentistry in Indore. He had previously undergone surgery to remove anodontogenic keratocyst from the right side of his jaw, involving the ramus and body of the mandible, eight months ago. As a result of the cyst removal, the patient developed a Class I Cantor and Curtis mandibular defect. He experienced recurrent infections with foul-smelling pus discharge and food lodgement in the surgical defect site.

During the surgery, a marginal mandibulectomy was performed on the affected right side of the mandible. However, the remaining mandible maintained its structural integrity, preserving the patient's facial form, facial profile, and symmetry. Crucially, the surgery did not impede the movement of the jaw, mouth opening, and muscle attachments, or the patient's ability to perform essential physiologic functions such as mastication, swallowing, and speaking.

Since the healing process was complete, the patient expressed a desire to have the defect restored. A definitive solution in the form of an obturator was planned.

On intraoral examination, the alveolar segment was intact with good occlusion of teeth. Mandible had an opening below the external oblique ridge area and hollowness in the mandible on the right side extending up to the midline of the mandible(Figure1).

Figure 1 - Pre-operative intra-oral view

On radiographic examination,Orthopantomograph revealed a surgical defectanda thin radio-opaque shadow nearthe right-side ramus of the mandible. (Figure 2)

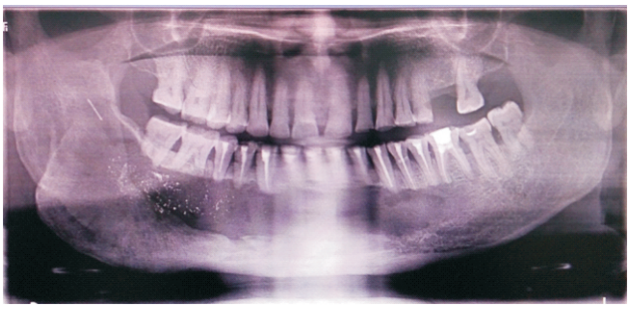

Figure 2 - Pre-operative Orthopantomograph

Impression was made using elastomeric impression material. Base and catalyst paste are mixed in equal proportions while using nitrile gloves. Polyvinyl siloxane - putty consistency(**Aquasil**; **Dentsply** DeTrey GmbH, Konstanz, Germany) was the impression material of choice because of high tear strength, good dimensional stability, elastic nature, adequate flow, fair surface detail reproduction, and excellent retrievability from undercut area without a tear.

The material was loaded in excess and pressure was applied over the external obliqueridge and body of the mandible on the right side without the use of a stock tray. The need for custom trays for polyether and addition-silicone impressions is not critical, since these materials are stiffer and have less polymerization shrinkage than the polysulfide material. Note that the use of less material in a custom tray reduces the compressibility of the impression, which can make the removal of the impression tray more difficult. When severe undercuts are present, the use of a custom tray should be avoided.[6] Once the material has set impression was removed. On examination of the impression a needle fragment was attached to the impression (Figure 3) thus it was an incidental retrieval of the needle fragment which was present unreported along the distal and superior wall of the defect causing chronic infection and purulent discharge from the defect cavity.

Figure 3 - Impression showing impregnated needle fragment

Thorough lavage of the defect cavity was performed and the patient was put on antibiotics and warm saline rinses and recalled after 3 days. The cavity was free of infection without any purulent discharge. The final impression was made with the use of Aquasil addition silicone in a sectional stock tray. Impression was poured andthe cast was retrieved. An obturator using heat cure polymerizing resin was made. The need for clasps was not there as there was an anatomical undercut present and the prosthesis was self-retentive. Prosthesis insertion was done after finishing and polishing. The patient was recalled after 1 week for follow-up.The patient was comfortable with the prosthesis and maintained good oral and prosthesis hygiene (Figure4). A postoperative panoramic radiograph confirmed the needle's retrieval (Figure5).

Figure 4 - Definitive Obturator

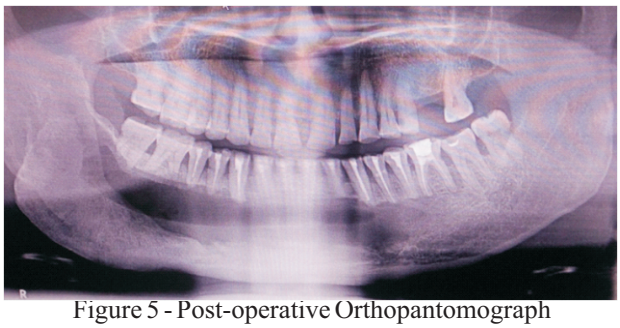

Figure 5 - Post-operative Orthopantomograph

## Discussion:

Diagnosis and treatment planning is the key to any restorative procedure. All steps should be followed critically and in case of any doubts further relevant investigation should be performed to avoid unseen complications. In the present situation though a radio-opaque shadow was noted but ignored and no further investigation was performed presuming that it is not related to restoration. But when the impression needle fragment was retrieved, we were forced to realize that the radio-opaque shadow was nothing but the impregnated needle fragment and that is why the patient was having persistent infection with purulent discharge from mandibular defect.

Accurate localization of needle fragments is important. Orthopantomography is an essential radiographic investigation, it should be critically analyzed. OPG gives a two-dimensional view and has its limitations. Zeltser et al. were the first to describe the use of a CT scan to localize surrounding structures such as vessels, the parotid gland, and muscular tissue, and to analyze the exact, three-dimensional location of the fragment.[7]Among these techniques, reconstructed images acquired from multi-planar CT scans were suggested for easy, immediate, and accurate detection of the broken needle fragment.

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. For successful removal, a detailed knowledge of the anatomical site where the needle fragment is lodged is essential. Needle retrieval should be a planned procedure. The surgical navigation system and Digital C-arm fluoroscopy image intensifying technique can be used for retrieval.

Medico legally, these patients are liable to demand compensation even if no physical problems develop.[8]

A syringe having a Luer-lock attachment system should be used to avoid the detachment of the needle from the syringe while pushing the irrigation solution into the cavity.[9]

To avoid needle breakage while infusing local anesthesia following measures are recommended.

-Do not use short needles for inferior alveolar nerve block in adults.

-Do not use 30-gauge needles for inferior alveolar nerve block in adults or children.

- Do not bend needles when inserting them into soft tissue.

-Do not insert a needle into soft tissue to its hub, unless it is absolutely essential for the success of the injection.

-Observe extra caution when inserting needles in younger children or in extremely phobic adult or child patients.

Should a needle break, a small curved hemostator cotton pliers should be readily available tograsp its broken end immediately before itdisappears into the soft tissue.[10]

## Conclusion:

The overall goal of needle fragment retrieval is to eliminate the potential risks associated with leaving a foreign object in the body, such as infection, tissue damage, or migration of the

fragment to other areas. The procedure requires skilled medical professionals and advanced imaging technologies to ensure a safe and successful outcome for the patient.

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