

ACCIDENTAL INSTRUMENT ASPIRATION IN GERIATRIC PATIENT: A CASE REPORT

ABSTRACT

This case report details an incident of endodontic file aspiration during a routine dental procedure, emphasising the importance of preventive measures, early diagnosis, and prompt treatment. A 68-year-old female patient with a hyperactive gag reflex experienced sudden aspiration of an endodontic file following a brisk movement. The use of a rubber dam and gauze pack was not feasible due to the patient's gag reflex. Immediate management included positioning the patient to encourage coughing, which proved ineffective. Subsequent radiographic imaging, including chest radiography localised the aspirated file in the larynx. Laryngoscopic retrieval was successfully performed with Magill's forceps, preventing potential complications such as respiratory distress or infection. This case underscores the need for heightened vigilance and adherence to protective protocols during dental procedures, especially in patients with increased risk factors. Preventive strategies, such as the use of physical barriers and appropriate patient positioning, are crucial in mitigating the risk of foreign body aspiration in dental practice.

INTRODUCTION

Accidental dental instrument aspiration is a rare but potentially serious complication that can occur during dental procedures. It involves the unintended inhalation of dental instruments or materials into the respiratory tract, which can pose significant health risks. This occurrence can lead to a range of complications, from minor irritation to severe respiratory distress and even life-threatening conditions such as airway obstruction or infection.

The likelihood of aspiration is influenced by various factors including the type of dental procedure, the size and shape of the instrument, and the patient's anatomy and reflexes. Preventive measures, such as using rubber dams, throat packs, or high-volume suction, are critical in minimising the risk. Additionally, dental professionals must be vigilant and well-prepared to manage such emergencies effectively. Understanding the etiology, prevention, and management of accidental dental instrument aspiration is crucial for dental practitioners to ensure patient safety and provide prompt, appropriate care when such incidents occur. This review aims to explore the underlying causes, preventive strategies, and recommended responses to accidental dental instrument aspiration, emphasising the importance of preparedness and adherence to safety protocols in dental practice.

CASE REPORT

A 68-year-old female patient reported to Bhojia dental college and hospital with complaint of pain and swelling in the lower left third molar since one week. Root canal therapy was planned for its management. Rubber dam isolation was not possible because of macroglossia and severe gag reflex. Access opening was done using dentistry access opening bur kit. Due to excessive salivation working length determination with apex locator was

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not reliable hence, we switched to radiographic working length determination. While taking radiograph, sudden movement by the patient resulted in accidental slippage of 10 no. k-file leading to aspiration in the larynx.

Post accident patient airway was assessed and patient was not showing any symptoms of respiratory distress and airway obstruction. She was then promptly shifted to the nearest general hospital. An anteroposterior and lateral chest radiographs were taken revealing presence of file in midline at the level of larynx (Fig. 1). The patient was immediately transferred to the minor operation theatre. Local topical anaesthesia was administered and the file was located in the subglottic region of the larynx using laryngoscope. It was then successfully retrieved using Magill's forceps. Postoperative period was uneventful. The root canal therapy was completed after a week.



Fig. 1,2. Lateral chest radiographs

DISCUSSION

Plethora of reports have been recorded in literature about accidental ingestion or aspiration of dental instruments, restorations and endodontic instruments during dental treatment. Dental emergency such as aspiration possess greater risk in elderly patients and to those who have diminished protective reflexes owing to various medications. Researchers have failed to arrive at conclusion regarding patient position for minimising risk of foreign body aspiration. There is no consensus in the literature regarding the optimal patient position to minimise the risk of foreign body aspiration. Neuhauser suggested that patients in a supine position are somewhat protected from swallowing foreign objects, while Barkmeier et al. indicated that the supine position might increase the risk of swallowing.^[1-2] Aspirated foreign objects can become lodged in the larynx, trachea, or bronchus, leading to a serious situation with the potential for suffocation.^[3] Susini et al. reported that the incidence of

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aspiration of endodontic instruments was 0.001 per 100,000 root canal treatments, while the incidence of ingestion was 0.12 per 100,000 root canal treatments.^[4]

Handling small, slippery instruments in a limited working area increases the risk of aspiration or ingestion, requiring special care due to the typical supine or semi-recumbent position of patients.^[5] The numbing effect of anaesthetic agents, loss of the gag reflex, excessive or unexpected patient movements during treatment, inadequate lighting, ineffective assistance, limited mouth opening, and the unexpected breakage or detachment of poor-quality instruments or their components are significant contributing factors to the aspiration or ingestion of foreign items in dentistry.^[6] Edentulous patients are more susceptible to the ingestion of small items concealed in a food bolus due to reduced tactile sensitivity of the palate caused by dentures. Therefore, it is always crucial to carefully review the patient's medical history during the initial appointment and perform a comprehensive physical examination.

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The signs and symptoms of aspiration or ingestion vary depending on the size and shape of the foreign body and whether it is free, fixed, or perforating. Aspiration can occur anywhere along the tracheobronchial tree, with the right bronchus being the most common site in adults due to its anatomical configuration.^[7] The most common symptoms of laryngotracheal obstruction are dyspnea, cough, and stridor. Some small foreign objects can inadvertently pass through the vocal cords without causing upper airway obstruction and remain asymptomatic for several months.^[8] However, long-term retention of these objects can lead to late complications such as vocal cord paralysis, postobstructive pneumonia, atelectasis, bronchiectasis, pneumothorax, hemorrhage, lung abscess, and even death.^[7]

This case highlights the critical importance of adhering to basic principles in dental care: preventing aspiration, ensuring early diagnosis, and providing prompt treatment. To prevent objects from entering the oropharynx, using a physical barrier such as a gauze curtain or a rubber dam is essential. For patients with strong gag reflexes who cannot tolerate these measures, proper chair positioning becomes crucial, with patients seated more upright and their head turned to one side.^[8] In this particular case, the use of a rubber dam and gauze pack was not feasible due to significant tooth structure loss and a hyperactive gag reflex. Furthermore, a sudden, brisk movement by the patient caused the operator to lose grip of the endodontic file, leading to its accidental passage into the oropharynx. Therefore, heightened vigilance is necessary when performing root canal treatment on such patients.

Although several strategies have been employed in dentistry to prevent the aspiration or ingestion of foreign objects, prevention remains the best method for managing such incidents. The use of a rubber dam is considered the easiest, most effective, and most common preventive measure for routine restorative and endodontic procedures.^[9] However, many dental interventions, particularly orthodontic, prosthodontic, and various microsurgical procedures, do not permit the use of a rubber dam. In these cases, other protective methods are recommended, such as gauze throat screens, high vacuum suction, customized impression trays, floss ligatures for small items, and using a more upright patient position. These measures are especially important for patients with diminished protective reflexes to minimize the risk of ingestion or aspiration.^[10]

CONCLUSION

This case emphasizes the necessity for dental professionals to be well-prepared to manage such emergencies, ensuring patient safety and optimal outcomes. Early recognition of high-risk factors and prompt identification of swallowed foreign bodies during any surgical or nonsurgical procedure involving the oral cavity are crucial to prevent catastrophic outcomes.

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