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Tooth Extraction in Uncontrolled Diabetes Leading to Cerebral Infarction and Death: A Case Report

Mooed Ur Rahman[1], *Hina Afsar*[1], *Aisha Zahoor*[1], *Rameen Siddiqui*[2]

[1]*Department of Dentistry, Lady Reading Hospital, Peshawar,* [2]*Department of Dentistry, Rehman College of Dentistry, Rehman Medical Institute, Peshawar, Pakistan.*

ABSTRACT

Tooth extraction is one of the most common dental procedures, generally safe and does not bear any complications, although several incidents have led to unpleasant consequences and fatality. The current case report is a fatal incident that happened to a 46-year-old male patient with a history of diabetes, who underwent the procedure of dental extraction for the first molar in a nearby clinic. The following day, the patient experienced swelling on the left side of the face, lid ptosis and dropping of the left corner of the mouth. Upon examination, temperature was 38°c, BP 100/65 mmHg, and heart rate 98 bpm, and labs showed glucose levels of 337mg/dl and HbA1C of 14.2%. The patient was referred to the neurosurgery department and was admitted immediately. The patient was managed for neurological symptoms, although the patient did not survive and eventually experienced demise after two days of admission, and on the third day of the dental extraction process.

Keywords: Tooth Extraction, Cerebral Infarction, Hyperglycemia, Ischemia, Fatal Outcome.
***Corresponding Author:** Moeed Ur Rehman
Email: moeedurrahman79@gmail.com

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INTRODUCTION

Tooth extraction is the procedure of removing the tooth from its socket, and is one of the most common dental procedures. Untreated dental caries, leading to tooth decay or permanent teeth, is the most prevalent health condition, as stated by the Global Burden of Disease Report 2021, affecting up to 3.69 billion people worldwide[1]. Meanwhile, poor oral hygiene practices have been found associated with dental decay, while the impact of diet and nutrition, genetics, trauma, medical conditions, medications and age-related changes eventually lead to the need for extraction[2,3] Tooth extraction often and generally is a safe procedure, although there are several instances in which it can

lead to post-procedural pain, bruising, uncontrolled bleeding and damage to adjacent soft tissues and teeth[4,5]. Diabetes Mellitus (DM) and oral diseases are associated; thus, people with diabetes have been reported to have a higher incidence of periodontal disorders, relative risk of dental and oral diseases increases 1.26 times with DM[6]. The current case report has focused on a male patient with uncontrolled diabetes, followed by dental extraction of the first molar on the left side, leading to cerebral infarction and death.

The presence of DM and a history of previous tooth extraction increased the risks of post-operative complications[7]. For instance, the Oslo II study in 2000, a follow-up study which was carried out for 12.5 years, stated that men with more than ten tooth extractions in the past had 2.9 times higher chances of dying from cerebral infarction[8]. The death of patients followed by tooth extraction is a rare but concerning issue. Upon searching the empirical evidence, no such cases can be found, although such instances have rarely been reported in the news. In 2024, a Chinese person died almost two weeks after extracting 23 teeth in a single day[9], thus, in a likewise incident, a 79-year-old man died a few weeks after a tooth extraction in the United Kingdom, due to infection and complications[10].

CASE PRESENTATION

The current case study has been reported from Lady Reading Hospital (LRH) Peshawar, and ethical approval was granted by the Departmental Research Committee (DRC) from the Department of Oral and Maxillofacial Surgery, LRH on 6th August 2024. Information related to the patient was obtained from the medical records and patient attendants through verbal and written consent, following the World Medical Association and Declaration of Helsinki guidelines.

The 46-year-old male presented with a one-day history left left-side facial swelling following extraction of left maxillary first Molar. According to the patient's attendant, the extraction was followed by a history of a few days of toothache, and the procedure was carried out by a dental practitioner in a nearby clinic. The patient belonged to the lower income class and was the guardian of four children. The patient was diabetic and had been taking oral medication for the last few years. Although, there was no history of hypertension, heart disease, kidney disease or any other chronic and systemic disease.

Table 1: Patients Characteristics and Clinical Parameters at Time of Presentation to Hospital

Parameter	Details
Age	46 years

Gender	Male
Procedure	Extraction of first molar (left maxillary region)
Co-morbidity	Diabetes Mellitus
Body Temperature	38 °C
Blood Pressure	100/65 mmHg
Random Blood Glucose	337 mg/dL
HbA1c	14.2 %

Upon examination, the patient was febrile with a fever of 38 degrees centigrade the blood pressure was 100/65mmHg and the heart rate of 98bpm as reported in **Table 1**. There was mild swelling on the left side of the face. There was a lid ptosis of the left side absence of forehead wrinkles and dropping of the corner of the mouth on the left side while in function (**Fig 1).**

Figure 1: Image of the patient showing Left lid ptosis and oral commissure ptosis at the left side

The patient has been unable to hear and speak since the extraction of his molar one day back. He was able to walk normally with no hemiplegia. Intraorally the extraction socket of the left maxillary first

molar was empty with fibrinous slough. The rest of the physical examination was unremarkable. The laboratory findings showed elevated random blood glucose level of 337mg/dl and HbA1C of 14.2%. CT brain and face were requested which showed a hypodense area at the left temporal with no shifting of midline and normal ventricles showing cerebral infarction **(fig 2).**

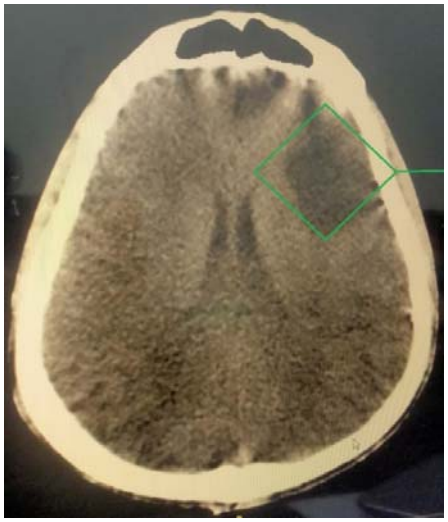

Figure 2: Brain CT showing infarction with hypodensity and midline shift towards left side

The molar socket was examined and it was empty with no residual tooth fragments or any foreign body. The patient was immediately referred and admitted to neurosurgery and diabetes control services simultaneously. Treatment was initiated, although the patient did not recover and expired on the second day of hospital admission, thus on the third day of the tooth extraction

DISCUSSION

In the current case study, the tooth extraction performed in uncontrolled diabetes was followed by cerebral infarction. A systematic review stated that a blood glucose level of 240 mg/dl should be considered a critical point for tooth extraction[11], while the patient in the case study had a glucose level of 337mg/dl. Thus, high blood glucose levels tend to reduce the levels of nitric oxide and develop high ketone bodies, which slows down the socket healing[11]. Patients with elevated glucose levels tend to have more complications of pain and bleeding after tooth extraction[12]. Similarly, in diabetics, Mucormycosis is a rare but opportunistic fungal infection that can lead to pain and other complications after tooth extraction[13]. Mucormycosis infections can lead to fatality as well, and thus a fatal case of rhinocerebral Mucormycosis was reported after dental extraction of the jaw, in a 70-year-old male patient with uncontrolled diabetes[14]. Although fatal cases related to anaesthesia and complications led by infections are common in dental extractions, the cases reported in the current study related to infarction are rare. Cerebral infarction in the studied participant is possible due to many factors, likely hypotension and thrombotic stroke, as well [15]. In the current study, the patient's

reports and history did not reveal any signs of thrombotic stroke or hypotension. While British researchers revealed that patients undergoing tooth extraction are at higher risk of short-term stroke and heart attack, patients with invasive dental treatment were found at risk of developing stroke Incidence ratio of 1.50 (95% CI 1.09-2.06) in the first four weeks after the procedure, while the risk gradually neutralised over the period of six months[16].

CONCLUSION

Tooth extraction in patients with uncontrolled diabetes can lead to postoperative complications. As reported in the current case study, the male patient with uncontrolled diabetes developed signs of left lid ptosis and lip commissure, which on CT showed hypodense areas, a sign of cerebral infarction. The patient did not survive and died two days after the tooth extraction procedure of the first molar on the left side

CONSENT

Patient consent was obtained from the caregiver and attendant of the patient, and the study was approved by the Departmental Research Committee of Lady Reading Hospital (LRH), Peshawar. Informed consent was obtained from the patient for publication of the case report and accompanying images.

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None

CONFLICT OF INTEREST

None

AUTHORS' CONTRIBUTION

MR, AZ, and **HA** collected data and were part of the multidisciplinary team during patient management. **RS** wrote the first draft of the manuscript. **MR** and **AZ** finalised the draft. All authors read and approved the final manuscript

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