

**Case Report**

Bilateral Circumorbital Ecchymosis and Unilateral Subconjunctival Hemorrhage Following Surgical Removal of an Impacted Maxillary Canine: A Rare Case Report

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Abstract

Surgical extraction of impacted maxillary canines is considered a routine procedure in Oral and Maxillofacial Surgery. However, uncommon postoperative complications may occasionally occur even after atraumatic and properly executed surgery. This report presents a rare case of bilateral circumorbital ecchymosis associated with unilateral subconjunctival hemorrhage that developed 24 hours following surgical extraction of an impacted maxillary canine in a healthy 23-year-old patient. The procedure was performed atraumatically by an experienced oral and maxillofacial surgeon with more than 25 years of surgical experience. The surgical procedure was completed uneventfully within approximately 15 minutes, and no intraoperative complications or traumatic events were reported. Conservative management was adopted, and complete spontaneous resolution occurred without permanent sequelae. This case highlights the importance of recognizing rare postoperative vascular complications despite proper surgical technique and uneventful extraction.

Keywords: Impacted maxillary canine, circumorbital ecchymosis, subconjunctival hemorrhage, postoperative complication, oral surgery, case report.

Introduction

Impacted maxillary canines represent one of the most frequently encountered tooth impactions in clinical dentistry, exceeded in prevalence only by mandibular third molars. Their reported prevalence in the general population ranges from 1% to 3%, with a notably higher incidence in females compared to males [1,2]. The maxillary canine occupies a strategically important position in the dental arch, playing a critical role in occlusal function, facial aesthetics, and arch continuity — factors that collectively make its management a priority in orthodontic and surgical treatment planning [3]. Surgical exposure or extraction of impacted maxillary canines is routinely performed as part of a multidisciplinary approach involving oral surgeons and orthodontists [4]. Although surgical management of impacted maxillary canines is generally considered safe and predictable, postoperative complications may occasionally arise. Commonly reported complications include pain, swelling, infection, trismus, alveolar osteitis, adjacent root resorption, and hematoma formation [5,6]. Beyond these routine complications, rare ophthalmic and periorbital sequelae following maxillary dentoalveolar surgery have been documented in the literature. These manifestations are of particular clinical significance because of their alarming appearance, the anxiety they generate in patients and clinicians alike, and their potential misinterpretation as

indicators of serious systemic or intracranial pathology [7,8].

Periorbital ecchymosis — also referred to as circumorbital ecchymosis or "raccoon eyes" — is characterized by subcutaneous hemorrhagic discoloration of the periorbital tissues resulting from the gravitational tracking of extravasated blood through fascial planes toward the orbital region [9]. While most commonly associated with facial trauma, anterior cranial fossa fractures, or major craniofacial surgical procedures, periorbital ecchymosis may rarely develop following apparently straightforward oral surgical procedures involving the maxilla [10]. This anatomical relationship is explained by the close proximity of the maxillary canine region to the infraorbital vascular network and the periorbital fascial spaces, which together provide a potential pathway for the propagation of hemorrhage following dentoalveolar surgery [5,11]. Subconjunctival hemorrhage refers to the rupture of small, fragile conjunctival blood vessels, resulting in a sharply demarcated area of red discoloration on the surface of the sclera. Although it is generally a benign and self-limiting condition, its postoperative occurrence following oral surgical procedures may cause considerable distress for both patients and clinicians [12]. The condition may arise spontaneously or in association with increased venous pressure, local anesthetic-related vascular trauma, or mechanical disruption during surgical manipulation [1,7].

Several pathophysiological mechanisms have been proposed to explain the development of periorbital and ocular hemorrhagic manifestations following maxillary dentoalveolar surgery. These include rupture of small vessels during mucoperiosteal flap elevation or bone removal, vascular trauma secondary to local anesthetic infiltration, transient increases in intravenous pressure resulting from postoperative coughing or straining, and the propagation of blood through loose connective tissue and fascial planes toward the orbital region [2,8,13]. The rich vascular supply of the maxillary region — encompassing contributions from the infraorbital, anterior superior alveolar, and facial arteries — creates a complex vascular environment in which even minor hemorrhagic events may propagate toward adjacent anatomical compartments [11,14]. Despite the high global frequency of impacted maxillary canine surgeries, bilateral circumorbital ecchymosis associated with unilateral subconjunctival hemorrhage as a postoperative complication of this procedure remains exceptionally rare. Only a limited number of analogous cases have been documented in the dental and maxillofacial surgery literature, and the precise pathophysiological mechanisms underlying these phenomena remain incompletely elucidated [1,7,15]. Enhanced clinician awareness of such unusual postoperative manifestations

is therefore essential to ensure accurate diagnosis, appropriate clinical management, and effective patient reassurance, while simultaneously excluding more serious orbital or intracranial pathology that may require urgent intervention [9,12].

The present paper reports a rare case of bilateral circumorbital ecchymosis associated with unilateral subconjunctival hemorrhage that developed 24 hours following surgical removal of an impacted maxillary canine in a healthy 23-year-old female patient. The clinical features, proposed etiological mechanisms, management strategy, and clinical outcome are discussed with the aim of enhancing clinician awareness regarding uncommon ophthalmic complications that may arise following routine oral surgical procedures.

Case presentation :

A 23-year-old female patient with no known systemic diseases or relevant medical history presented for surgical extraction of an impacted maxillary canine. Clinical and radiographic examination, including panoramic radiography (Figure 1) and cone beam computed tomography (CBCT) (Figure 2), confirmed the diagnosis and defined the three-dimensional position of the impacted tooth. Surgical removal under local anesthesia was subsequently planned.



Figure1. Pre operative panoramic radiograph demonstrating the impaction of maxillary canine

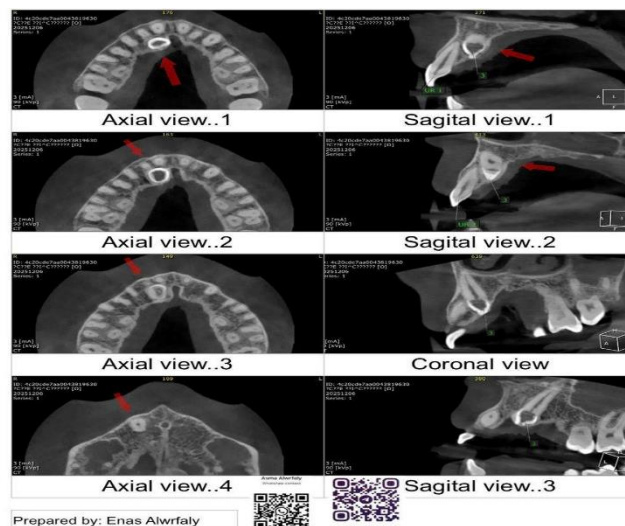


Figure 2. Preoperative CBCT image confirming the position and impaction of maxillary canine

The procedure was performed by a consultant oral and maxillofacial surgeon with approximately 25 years of surgical experience. A mucoperiosteal flap was carefully elevated, and controlled bone removal was performed to facilitate tooth delivery. The extraction was atraumatic; no excessive force, significant intraoperative bleeding, sinus perforation, or other surgical complications were encountered. The entire procedure was completed uneventfully within approximately 15 minutes.

Approximately 24 hours postoperatively, the patient returned complaining of periorbital discoloration. Clinical examination revealed bilateral circumorbital ecchymosis (Figure 3) associated with unilateral subconjunctival hemorrhage involving the right eye (Figure 4). Mild postoperative swelling extending toward the neck region was also observed (Figure 5). However, the patient reported no pain, visual disturbance, diplopia, limitation of ocular movement, fever, or neurological symptoms.



Figure3. Clinical photograph demonstrating bilateral circumorbital ecchymosis



Figure4 Clinical photograph showing unilateral subconjunctival hemorrhage involving the right eye.





Figure 5. Clinical photograph showing swelling extended to the neck

The patient denied any history of trauma, severe coughing, vomiting, sneezing, or heavy physical exertion following the procedure. Vital signs were stable, and there were no clinical signs of active hemorrhage, infection, coagulopathy, or systemic involvement. No laboratory investigations or additional imaging were deemed necessary given the absence of clinical indicators of serious pathology.

Based on the clinical presentation and temporal relationship to the surgical procedure, a diagnosis of postoperative bilateral circumorbital ecchymosis associated with unilateral subconjunctival hemorrhage secondary to surgical extraction of an impacted maxillary canine was established. Conservative management was adopted, comprising patient reassurance, cold compression during the early postoperative period, analgesics as required, and regular follow-up. Both the ecchymosis and the subconjunctival hemorrhage resolved spontaneously and completely after one-week without the need for surgical intervention or additional treatment, and without residual complications.

Ethical Approval and patient consent statement:

This study was approved by the Ethics Committee at Noor Al-hakim Hospital, Benghazi, Libya

The patient was fully informed about the purpose of the research and the potential publication of their clinical case in a medical journal. Written informed consent was obtained, ensuring the patients' understanding of the use of their clinical data and images for academic and research purposes. All efforts were made to maintain confidentiality and anonymity throughout the process.

Discussion

Postoperative complications involving the orbital and periorbital regions following dentoalveolar surgery are uncommon but clinically important due to their striking appearance and potential association with serious orbital or intracranial pathology. Reported ophthalmic complications after oral surgical procedures include diplopia, transient visual disturbances, orbital emphysema, subconjunctival hemorrhage, and periorbital ecchymosis [1,2,6]. Among these, bilateral circumorbital ecchymosis accompanied by unilateral subconjunctival hemorrhage following surgical extraction of an impacted maxillary canine represents an exceedingly rare clinical entity, with only a limited number of comparable cases described in the international literature [1,7,15].

The precise pathophysiological mechanism underlying the development of circumorbital ecchymosis in the present case cannot be determined with certainty. However, the most plausible explanation involves

disruption of small blood vessels during mucoperiosteal flap elevation or controlled bone removal, with subsequent tracking of extravasated blood through loose connective tissue and fascial planes toward the periorbital region [2,5]. The intimate anatomical relationship between the maxillary canine region, the infraorbital neurovascular bundle, and the periorbital soft tissues provides a well-established pathway for such hemorrhagic propagation [5,11]. The fascia overlying the infraorbital region is continuous with the orbital septum, thereby allowing blood to dissect inferiorly toward the periorbital tissues even in the absence of significant intraoperative hemorrhage.

A secondary contributing mechanism may involve vascular trauma secondary to local anesthetic infiltration. Accidental puncture of small-caliber vessels during injection can lead to delayed hemorrhagic extravasation into adjacent fascial spaces, with gravitational spread subsequently producing periorbital discoloration [1,2]. This mechanism is particularly plausible in the maxillary canine region given the proximity of the anterior superior alveolar and infraorbital vessels. Additionally, postoperative soft tissue edema may facilitate the redistribution of blood products into adjacent anatomical compartments, potentially accounting for the bilateral distribution of ecchymosis despite unilateral surgery [8]. The bilateral nature of the periorbital ecchymosis in this case, in the context of unilateral surgery, warrants specific discussion. The most likely explanation involves the crossing of blood products across the midline through the loose areolar connective tissue of the orbital region, a phenomenon well recognized in cases of anterior skull base fractures presenting with bilateral "raccoon eyes" [9]. The relatively lax tissue architecture of the periorbital region, combined with the absence of fascial barriers capable of restricting hemorrhagic spread, facilitates this bilateral distribution [10].

The coexisting unilateral subconjunctival hemorrhage may be attributed to similar mechanisms — namely, rupture of fragile conjunctival capillaries secondary to local vascular pressure changes or direct propagation of hemorrhage along periorbital fascial planes to the conjunctival tissue. Subconjunctival hemorrhage following maxillary dental extractions has been reported previously, typically in association with fracture of the maxillary tuberosity or excessive surgical force [1,2]; however, its occurrence without such predisposing factors, as in the present case, underscores the potential for spontaneous vascular events even during atraumatic procedures.

Importantly, the procedure in the present case was performed by a surgeon with extensive experience, was



completed within a short operative time, and was not associated with excessive force application, sinus perforation, or clinically significant intraoperative bleeding. The patient also denied any postoperative precipitating events. Taken together, these findings support the hypothesis that rare spontaneous vascular leakage can occur through fascial planes independently of surgical trauma, a phenomenon that may be facilitated by individual anatomical variation in the density and permeability of the relevant fascial structures.

The absence of visual impairment, diplopia, ophthalmoplegia, severe orbital pain, proptosis, or neurological symptoms was clinically reassuring and enabled the exclusion of more serious complications, including orbital hematoma with compartment syndrome, cavernous sinus thrombosis, and intracranial hemorrhage [3,6]. Conservative management was therefore appropriate, and the favorable outcome — with complete spontaneous resolution and no residual sequelae — is consistent with previously reported cases of postoperative periorbital ecchymosis and subconjunctival hemorrhage managed conservatively [1,2,7].

This case underscores the importance of comprehensive preoperative counseling regarding the possibility of rare postoperative complications, even following technically

uncomplicated procedures. It also highlights the necessity for clinicians to maintain a high index of suspicion when evaluating periorbital and ocular findings in the postoperative period, ensuring that benign hemorrhagic complications are accurately distinguished from conditions requiring urgent ophthalmological or neurosurgical intervention.

Conclusion

Bilateral circumorbital ecchymosis associated with unilateral subconjunctival hemorrhage following surgical removal of an impacted maxillary canine represents an exceptionally rare postoperative complication in oral and maxillofacial surgery. In the present case, this complication developed despite an atraumatic procedure performed by an experienced surgeon without intraoperative complications or identifiable precipitating factors. Conservative management resulted in complete spontaneous resolution without residual effects. Clinicians should be aware of such uncommon postoperative vascular manifestations to facilitate accurate diagnosis, appropriate patient reassurance, and timely exclusion of serious orbital or intracranial pathology

Figure legends:

Figure1. Preoperative panoramic radiograph demonstrating the impacted maxillary canine.

Figure 2. Preoperative CBCT image confirming the position and impaction of the maxillary canine.

Figure3. Clinical photograph demonstrating bilateral circumorbital ecchymosis.

Figure4 . Clinical photograph showing unilateral subconjunctival hemorrhage involving the right eye.

Figure5. Clinical photograph showing swelling extended to the neck .

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