

Orbital compartment syndrome secondary to retrobulbar hematoma after infratrochlear nerve block for nasolacrimal probing

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ABSTRACT

After infratrochlear nerve block for nasolacrimal probing, sudden vision loss, proptosis, pain, loss of light reflexes, and a total limitation of ocular movement was observed in a 71-year-old female patient. She was diagnosed with retrobulbar hemorrhage and orbital compartment syndrome (OCS). Lateral canthotomy, cantholysis, and medial orbitotomy were performed on the patient. She was not taking any oral anticoagulant medication and did not have any disease other than hypothyroidism and systemic hypertension. All the clinical findings returned to normal right after the intervention except mild ptosis (~1 mm), which persisted for 2 months. All patients scheduled for periocular anesthesia should be questioned about using oral anticoagulant medications, and the possibility of serious complications should be kept in mind even for patients without any risk factors. Patients with OCS secondary to retrobulbar hemorrhage should be surgically managed within the critical window (90 min) to prevent any irreversible optic nerve injury.

Keywords: Infratrochlear nerve block; orbital compartment syndrome; periocular anesthesia; probing; retrobulbar hemorrhage.

INTRODUCTION

Epiphora secondary to nasolacrimal canal stenosis or obstruction is a common ophthalmological problem. Probing is a procedure that can be applied easily under local anesthesia on adult patients to diagnose any obstruction in the lacrimal canalicular system.^[1] Before the probing procedure, topical 0.5% proparacaine is instilled and the infratrochlear nerve is blocked with epinephrine (1:100000) and 2% lidocaine (1 cc).^[2] The infratrochlear nerve is a branch of the nasociliary nerve innervating the lacrimal sac, medial canthus, and lateral side of the nose. To block the infratrochlear nerve, anesthetic medicine is applied with a needle through the medial wall of the orbit and superior to the medial canthal ligament to a depth of 1.0 cm.^[3]

Regional ophthalmic anesthesia-related complications include retrobulbar hemorrhage, globe perforation, persistent

diplopia due to myelotoxic effect, ocular ischemia, optic nerve and facial nerve injury, and brainstem anesthesia.^[4] Retrobulbar hemorrhage is a rare and severe condition that may cause permanent loss of vision, particularly if associated with orbital compartment syndrome (OCS). The most common cause of retrobulbar hemorrhage is trauma. Furthermore, retrobulbar hemorrhage is the most common cause of post-traumatic blindness after an orbital fracture. The incidence of retrobulbar hematoma secondary to orbital fracture is reported as 0.45–0.6%. It can also be observed after repetitive surgeries or during retrobulbar anesthesia procedures. Although the rate of retrobulbar hematoma after retrobulbar anesthesia has been reported as 0.44%^[5] and after infratrochlear nerve block as 2%,^[6] to date OCS secondary to retrobulbar hemorrhage after infratrochlear nerve block and its management has not been reported in the literature.

Cite this article as: Arici C, Gonen B, Mergen B, Sarici AM. Orbital compartment syndrome secondary to retrobulbar hematoma after infratrochlear nerve block for nasolacrimal probing. *Ulus Travma Acil Cerrahi Derg* 2022;28:711-713.

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Ulus Travma Acil Cerrahi Derg 2022;28(5):711-713 DOI: 10.14744/tjtes.2020.67932 Submitted: 07.07.2019 Accepted: 05.08.2020

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Here, we present an adult patient with epiphora who developed OCS secondary to retrobulbar hemorrhage after infratrochlear nerve block and discuss its management.

CASE REPORT

A 71-year-old female patient was referred to our department complaining of a watery eye. Stenosis in the nasolacrimal canal together with an obstruction in the lower punctum had been observed in the dacryocystographic image of the patient 6 months previously. Punctoplasty and nasolacrimal probing had been performed on the patient. After a recurrence of the symptoms, a new nasolacrimal probing was planned. One cc of 2% lidocaine with epinephrine (1:100000) was applied to the medial orbital wall 1 cm above the punctum with a 27-gauge needle to block the infratrochlear nerve. One min after the anesthetic procedure, proptosis, total limitation of ocular movement, pain, loss of light reflexes, and sudden vision loss were observed. Her clinical picture was consistent with OCS secondary to acute retrobulbar hemorrhage. Emergent lateral canthotomy and cantholysis were performed in the operating theatre. Then, since the limitation of ocular movement persisted, medial orbitotomy from the upper crease was performed to drain the remaining hemorrhage. Light reflexes returned to normal after the intervention. Proptosis and total limitation of ocular movement were relieved. A medical history of the patient revealed that she had been using carvedilol 12.5 mg for 2 years and levothyroxine for hypothyroidism. She had no history of any other disease and no history of using any prescribed blood thinner medication.

At post-operative day 3, ocular movement was free in all directions, light reflexes were normal, and her best-corrected visual acuity returned to the pre-procedural level (20/20)



Figure 1. Resolving of the clinical findings 1 day after medial orbitotomy, lateral canthotomy, and cantholysis (a) except mild ptosis which persisted 2 months after the incident (b).



Figure 2. Area of canthotomy, cantholysis, and medial orbitotomy 1 week after the operation.

(Fig. 1a). Thus, the patient was discharged from the hospital. One week after the orbitotomy, the sutures were removed and, apart from mild ptosis (~1 mm) (Fig. 2), no pathological finding was observed in the 2 month (Fig. 1b). The patient's ptosis was resolved at the end of the 4 month. Retinal nerve fiber layer (RNFL) analysis with optic coherence tomography showed that the RNFL thickness was within normal range.

This report adheres to the ethical principles outlined in the declaration of Helsinki. Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

DISCUSSION

OCS is caused by an increase of pressure after any limitation of volume increase within the orbit. Retrobulbar hemorrhage is the most common cause of OCS.^[7] Although the rate of retrobulbar hemorrhage after retrobulbar injection (0.05–0.44%)^[8,9] or infratrochlear nerve block (2%)^[6] has been reported, to date, no case report has been presented to describe the development of OCS secondary to retrobulbar hematoma after infratrochlear nerve block.

The globe and retrobulbar structures are surrounded by a fascial envelope limiting any volume increase. Thus, any increase in the orbital volume above this limit may potentially cause an increase in pressure leading to OCS. Pressure increase compresses the optic nerve and vascular structures.^[7] When retrobulbar hemorrhage occurs and retrobulbar pressure increases to a critical level that could lead to irreversible optic nerve and retinal ischemic injury (OCS), the critical window has been reported as 60 min, and loss of vision develops within 1.5–2 h. Therefore, surgical management should be started within 90 min after the incident.^[10] In our case, we were able to start lateral canthotomy and medial orbitotomy in 30 min and finished the total removal/drainage of the hematoma within 60 min. Thus, we were able to manage the incident without any complication or loss of vision despite the older age of the patient.

The severity of the retrobulbar hemorrhage after periocular anesthesia depends on the origin of the bleeding. Arterial bleeding is the most dangerous and can lead to tamponade followed by OCS. The site of injection is also important. The vascular structures are larger in the orbital apex. The vasculature is crowded around the superonasal area where the infratrochlear nerve block is performed. There can also be vascular anatomical variations leading to bleeding even when the standard procedure is applied.^[11,12] The dorsal nasal artery is located in close proximity to the infratrochlear nerve. Therefore, this vessel may be responsible for most retrobulbar hemorrhage incidents. Thus, caution should be taken when performing an infratrochlear block in this area. The patient should be questioned about anticoagulant drug use to decrease the risk of bleeding after these common procedures. In our case, the hemorrhage was probably from an artery since the bleeding caused proptosis in a few minutes.

Conclusion

We presented a case of OCS secondary to retrobulbar hemorrhage after an infratrochlear nerve block procedure; emergent orbitotomy prevented any injury to the optic nerve. All patients planned to have periocular anesthesia should be questioned about using oral anticoagulant medications and the possibility of serious complications should be kept in mind even with patients without any risk factor. Patients with OCS secondary to retrobulbar hemorrhage should be surgically managed within the critical window (90 min) to prevent irreversible optic nerve injury. We suggest that the operating room should be easily accessible when performing an infratrochlear block.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Internally peer-reviewed.

Authorship Contributions: Concept: C.A., B.G., B.M., A.M.S.; Design: C.A., B.G., B.M., A.M.S.; Supervision: C.A.,

B.G., B.M., A.M.S.; Data: C.A., B.G., B.M.; Analysis: C.A., B.G., B.M.; Literature search: C.A., B.G., B.M., A.M.S.; Writing: C.A., B.G., B.M., A.M.S.; Critical revision: C.A., B.G., B.M., A.M.S.

Conflict of Interest: None declared.

Financial Disclosure: The authors declared that this study has received no financial support.

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OLGU SUNUMU - ÖZ

Nazolakrimal probing için yapılan infratrochlear sinir bloğu sonrası gelişen retrobulbar hematom nedenli orbital kompartman sendromu

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Yetmiş bir yaşında kadın hastada nazolakrimal probing işlemi için yapılan infratrochlear sinir bloğu sonrası ani görme kaybı, ışık refleksi kaybı, proptozis ve göz hareketlerinin total kısıtlanması gözlemlendi. Hastaya retrobulbar hemoraji nedenli orbital kompartman sendromu tanısı kondu ve lateral kantotomi, kantoliz ve medial orbitotomi yapıldı. Hastanın herhangi bir oral antikoagülan ilaç veya hipotiroidi ve sistemik hipertansiyon dışında herhangi bir sistemik hastalık öyküsü yoktu. Hastanın iki ay persiste eden hafif proptozis (~1 mm) dışındaki tüm klinik bulguları normale döndü. Perioküler anestezi işlemi planlanan tüm hastalar antikoagülan ilaç kullanımı açısından sorgulanmalı, fakat herhangi bir risk faktörü olmayan bir hastada bile bu işlemler sırasında ciddi komplikasyonlar gelişebileceği mutlaka akıldan tutulmalıdır. Retrobulbar hemoraji nedenli orbital kompartman sendromu gelişen hastalara geri dönüşsüz optik sinir hasarı oluşumunu engellemek adına kritik sürede (90 dakika) cerrahi müdahale uygulanmalıdır.

Anahtar sözcükler: Infratrochlear sinir bloğu; orbital kompartman sendromu; perioküler anestezi; probing; retrobulbar hemoraji.

Ulus Travma Acil Cerrahi Derg 2022;28(5):711-713 doi: 10.14744/tjtes.2020.67932