

Bilateral Periorbital Ecchymosis Following Ablative Laser Removal of Xanthelasma Palpebrarum

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ABSTRACT Periorbital ecchymosis is a rare finding with various, sometimes life-threatening pathologies. We report the case of a 48-year-old woman who presented with bilateral periorbital ecchymosis after laser removal of xanthelasma palpebrarum. Her medical history was unremarkable. Amyloidosis could be excluded by histopathology. We suggest that periorbital ecchymosis is a rare adverse event after minor (laser) surgery of the eyelids and discuss the possible pathogenesis and differential diagnoses.

KEY WORDS: periorbital ecchymosis, amyloidosis, laser, lid surgery.

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INTRODUCTION

Periorbital ecchymosis is an uncommon clinical finding with various underlying pathologies. It is also known as panda sign, black eyes, or raccoon eyes. The color changes are due to bleeding into the soft tissue of the upper and lower eyelids. Traumatic and atraumatic causes have been described in the medical literature (Table 1).

The most important traumatic cause for periorbital ecchymosis is skull base fracture. Typically, this condition is also accompanied by retro-auricular or mastoid ecchymosis along the posterior auricular artery, also known as Battle's sign (1,2).

The most important atraumatic cause is immunoglobulin light chain (AL) amyloidosis with bleeding, known as amyloid purpura. Other symptoms are fatigue and edema, neuropathy, weight loss with

diarrhea or constipation, macroglossia and other hypertrophies, and internal (mostly gastrointestinal) bleeding. Cardiac and renal involvement have a worse prognosis. AL deposits stain positive with Congo Red and show an apple-green birefringence with polarized light. AL amyloidosis may be associated with multiple myeloma. An early diagnosis helps to improve prognosis (3).

Various traumatic and atraumatic causes have been described in the medical literature which are summarized in Table 1 (4-19).

CASE REPORT

An otherwise healthy 48-year-old woman was referred to our department due to the development of bilateral periorbital ecchymosis. Her medical history



Table 1: Underlying pathologies of periorbital ecchymosis

Cause	Disease	Reference
Traumatic	Skull base fracture	Herbella <i>et al.</i> 2001
	Rhinoplasty	Al Arfaj 2015
	Ear surgery	Rajati <i>et al.</i> 2013
	Sinus surgery	Seredyka-Burduk <i>et al.</i> 2017
	Continuous positive airway pressure	DelRosso <i>et al.</i> 2012
	Eyebrow plucking	Kandogan <i>et al.</i> 2005
	Permanent tattoo	Goldman & Wollina 2014
Neoplastic	Endoscopic retrograde cholangio-pancreatography	Nasiri & Zamani 2017
	Proctoscopy	Truniger & Gebbers 1998
	Neuroblastoma	Smith <i>et al.</i> 2010
	Lymphoma	Yuen <i>et al.</i> 2017
	Kaposi's sarcoma	Schwartz <i>et al.</i> 1995
	Light-chain (AL) amyloidosis	Passos Rda <i>et al.</i> 2006
	Light-chain deposition disease (kappa light chain)	Pereira <i>et al.</i> 2014
Systemic amyloidosis	Kandavar <i>et al.</i> 2016	
Multiple myeloma	Varim <i>et al.</i> 2016	

was unremarkable. She had not taken any medications. There had been no trauma, no invasive diagnostics, and no surgery except an ablative laser treatment for xanthelasma palpebrarum with an erbium-YAG-laser after application of prilocaine/ lidocaine (EMLA®) cream. During the laser application she wore protective goggles F18P1L12 Laservision (uvex safety group).

We observed a bilateral ecchymosis of the upper and lower eyelids associated with a slight erythema and tarsal sparing (Figure 1). There was no infiltration, scaling, or pruritus. Examination of the skin and oral mucosa did not reveal other signs of bleeding, in particular no Battle's sign.

We took a skin biopsy to exclude AL amyloidosis. The epidermis was slightly atrophic, showing dermal elastosis. Congo Red-stain remained negative. Routine laboratory results were unremarkable. There was



Figure 1. Initial presentation with sharply demarcated bilateral periocular ecchymosis and lid edema.

spontaneous improvement during follow-up (Figure 2), and a complete clearing of the ecchymosis was observed after 4 weeks.

DISCUSSION

Bleeding into the soft tissue around the eyes is responsible for the phenomenon of "raccoon eyes". An ecchymosis is defined as an area of blood extravasation >5 mm in size and is a consequence of small or medium sized blood vessel trauma. Petechial hemorrhages are smaller (<2 mm) and typically due to damage to dermal capillaries. Confluent periocular petechial hemorrhages are seen in amyloidosis (2,3).

In traumatic periocular ecchymosis, the blood becomes entrapped by the orbital septum inserting into the tarsal plate of the upper eyelid, thereby limiting extravasation. This results in tarsal plate sparing.



Figure 2. Two weeks later with a marked spontaneous reduction in edema and ecchymosis.

The lower margin of orbital ecchymosis is defined by the orbital septum that arises as a fibrous extension of the arcus marginalis. In atraumatic cases, tarsal sparing is absent (20).

In the present case, minor laser surgery for xanthelasma palpebrarum was associated with bilateral periorbital ecchymosis. Laser treatment of xanthelasma palpebrarum has been reported with a great variety of laser types including carbon dioxide, yttrium aluminum garnet, pulsed dye, argon, and 1450 nm diode laser. All of the laser modalities offer moderate to excellent clearance rates with minimal adverse effects (21). One possible temporary adverse event after laser therapy is postinflammatory hyperpigmentation. This is rare in Caucasians after erbium-YAG laser (22).

Periorbital ecchymosis in our case may be explained by temporary increase in orbital venous hypertension and palpebral edema during local anesthesia for laser therapy.

Intravascular papillary endothelial hyperplasia should be considered in the differential diagnosis, which is a highly vascular lesion that can cause excessive intraoperative bleeding (23). However, our patient had no orbital mass and her ecchymosis was bilateral.

Orbital vascular malformations are another theoretical cause of periorbital ecchymosis often associated with a reduction in visual acuity at presentation (24). In the present case, no visual symptoms had been reported.

Another possibility is a petechial and purpuric reaction after the application of lidocaine/prilocaine cream for local anesthesia. This is due to a toxic reaction (25). Indeed, the patient had been treated with EMLA® cream before surgery.

CONCLUSION

Periorbital ecchymosis is a possible adverse event in minor laser surgery of the eyelids, although the exact mechanism of bleeding has not been elucidated. However, application of EMLA® cream and local injection anesthesia seem to be the most plausible cause.

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