“Why Did My CPAP Beat Me Up?” Bilateral Periorbital Ecchymosis Associated with Continuous Positive Airway Pressure Therapy

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The patient is a 63-year-old man with past medical history of hypertension, coronary artery disease, diabetes mellitus, hyperlipidemia, gastroesophageal reflux disease, and obstructive sleep apnea (OSA) diagnosed at the age of 58. Medications include aspirin 325 mg daily and clopidogrel 75 mg daily for 2 years without complication; clonazepam 1 mg daily, gemfibrozil 600 mg twice daily, metoprolol 12.5 mg twice daily, niacin 500 mg daily, ranitidine 150 mg twice daily, rosuvastatin 10 mg daily, and valsartan 160 mg daily. Two months ago he started using vitamin E 1000 international units per day and fish oil supplements. For 5 years he has been compliant with continuous positive airway pressure (CPAP) of 10 cm through a soft nasal pillow interface and soft head

gear without complication. CPAP compliance card report indicates 100% CPAP use > 4 h/day, average use 9 h/day, and no significant air leaks.

He now presents with 2 episodes of bruising around his eyes upon awakening following nocturnal CPAP use. He initially noticed bruising around the left eye which resolved over the course of one month. He did not pursue evaluation or treatment. Then he noticed new bruising around the right eye. He denied history of trauma, headaches, eye dryness or pain, vision changes, cough, sinus pain, or nasal discharge. He denied strenuous exercise or weight lifting. Significant air leak from his CPAP mask was not detected. He denied any other bleeding, including gums, urinary tract, or rectum.

Figure 1—Periorbital ecchymosis associated with continuous positive airway pressure therapy for obstructive sleep apnea

The photograph on the left shows the patient with periorbital ecchymosis around the left eye, which resolved. The photograph on the right was taken one month later and showed a new right periorbital ecchymosis.

Physical examination revealed a large periorbital ecchymosis around the right eye (**Figure 1**). No scleral, skin, or nail bed petechial hemorrhages were noted. Pupils were round and reacted to light bilaterally. Visual fields were intact bilaterally. Fundoscopic examination revealed sharp discs bilaterally, with no evidence of intraocular or retinal hemorrhage.

Laboratory evaluation revealed no evidence of coagulopathy, thrombocytopenia, or Vitamin C deficiency (**Table 1**). Aspirin and clopidogrel platelet inhibition assays showed normal platelet inhibitory responses to these medications. Computerized tomography of the head was unremarkable, with no evidence of intracranial bleeding or basilar skull fracture.

QUESTION

What is the most likely mechanism for this patient's bilateral periorbital ecchymosis? What is your treatment recommendation?

Table 1—Laboratory Results

Coagulation Labs	Result	Normal Range
Platelet count	227	150-450
Prothrombin time (PT)	13.4 seconds	12-14.7 seconds
Partial thromboplastin time (PTT)	29 seconds	24-37 seconds
International normalized ratio	1	
Antithrombin III	126%	80-123%
Factor VIII level	122%	61-147%
Von Willebrand	98%	50-140%
Platelet inhibition for aspirin	399 ARU	0-550 ARU
Platelet inhibition for clopidogrel	76%	40-60%
Other Labs		
Aspartate transaminase (AST)	28 U/L	15-40 U/L
Albumin	3.9 g/dL	3.4-5.0 g/dL
Total bilirubin	0.5 mg/dL	0.02-1.2 mg/dL
Blood urea nitrogen (BUN)	16.9 mg/dL	6-20 mg/dL
Creatinine	0.8 mg/dL	0.6-1.3 mg/dL
Vitamin C level	0.9 mg/dL	0.4-9 mg/dL

ANSWER

Initiation of Vitamin E and fish oil supplementation in combination with aspirin and clopidogrel use may have led to ecchymosis. We recommended discontinuation of Vitamin E and fish oil supplements.

Ecchymosis is an area of blood extravasation larger than 5 mm in size and is usually secondary to small or medium sized blood vessel trauma.³ In patients with either congenital or acquired coagulation defects, even trivial trauma may result in ecchymosis. Petechial hemorrhages are smaller (< 2 mm) and typically due to damage to dermal capillaries. Causes of petechial hemorrhages include increased hydrostatic pressure in the capillary system (e.g., post-tussive or post-strangulation); infections (e.g., Rocky Mountain Spotted Fever); small vessel vasculitis (e.g., Henoch Schönlein Purpura); and poor capillary structural integrity (e.g., scurvy or amyloidosis). Confluent periorbital petechial hemorrhages may morphologically resemble ecchymosis as can be seen in amyloidosis.⁴ Our patient had no clinical features, or laboratory results suggestive of congenital or acquired coagulation defects; increased hydrostatic pressure; infection; vasculitis; or amyloidosis.

Complications associated with nasal CPAP therapy for OSA include nasal congestion; rhinorrhea; sneezing; mild to moderate epistaxis; and rarely severe epistaxis.^{1,2} To our knowledge, periorbital ecchymosis has not previously been reported as a complication of CPAP therapy.

We postulated that this patient's recurrent periorbital ecchymosis was due to a combination of factors. Vitamin E has anticoagulant properties, possibly due to an inhibition of collagen-induced platelet activation and protein kinase C-dependent aggregation.⁵ Omega-3 fatty acids are also natural anticoagulants, and case reports indicate an increased bleeding risk when combined with other forms of anticoagulation.⁶ The combined antiplatelet activity of aspirin, clopidogrel, Vitamin E, and fish oil supplements, along with a CPAP induced elevation in central venous hydrostatic pressure, may have led to the development of periorbital capillary damage. The initial left periorbital ecchymosis followed by right periorbital ecchymosis may have been due in part to sleep position and/or positioning of the nasal CPAP nasal mask. Discontinuation of the Vitamin E and fish oil supplements resulted in complete resolution of the CPAP associated periorbital ecchymosis. The patient continued using CPAP with adequate compliance.

CLINICAL PEARLS

1. Bruising associated with CPAP should prompt a search for a bleeding diathesis.

2. Assessment of over-the-counter supplement use and their potential interactions with prescription medications is an important component of the sleep medicine history.
3. Vitamin E and fish oil supplements should be used with caution in patients on antiplatelet medications such as aspirin or clopidogrel.
4. Even low to moderate continuous positive airway pressures (CPAP) can lead to facial ecchymosis in patients on multiple antiplatelet medications or supplements.

CITATION

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