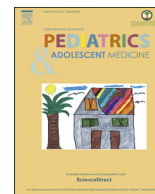


HOSTED BY



Contents lists available at ScienceDirect

International Journal of Pediatrics and Adolescent Medicine

journal homepage: <http://www.elsevier.com/locate/ijpam>

Balloon purpura

Victoria M. Madray^{a,*}, Kendall R. Liner^b, Loretta S. Davis^b^a Medical College of Georgia at Augusta University, 1004 Chafee Ave FH-100, Augusta Ga, 30912, USA^b Department of Dermatology, Medical College of Georgia at Augusta University, 1004 Chafee Ave FH-100, Augusta Ga, 30912, USA

ARTICLE INFO

Article history:

Received 7 April 2020

Accepted 25 July 2020

Available online 31 July 2020

Keywords:

Purpura

Petechiae

Valsalva

Balloon

ABSTRACT

Valsalva maneuvers have the potential to cause dermal capillary rupture manifesting as purpura and petechiae. We present a unique case of Valsalva purpura occurring in a 12-year-old girl after blowing up multiple balloons at a birthday party. Obtaining a detailed history proved essential to the diagnosis and curtailed any unnecessary workup or concern.

© 2020 Publishing services provided by Elsevier B.V. on behalf of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A healthy 12-year-old girl presented to the clinic with an asymptomatic facial rash of two days duration. Lesions were stationary and had not progressed since the onset of disease. She denied any facial trauma, taking any prescription or over-the-counter medications, and a history of fever or systemic symptoms. An examination revealed multiple nonblanching red to violet macules extending bilaterally from the oral commissures onto the chin (Fig. 1). Upon detailed questioning, she reported blowing up more than 10 balloons at a sleepover party just prior to noticing the skin changes. A diagnosis of perioral petechiae secondary to forceful expiration, i.e., Valsalva purpura, was made.

In this child, increased thoracic pressure from blowing up multiple balloons caused the rupture of dermal capillaries and resultant perioral petechiae. This phenomenon, known as Valsalva purpura, has been reported secondary to multiple activities including coughing, sneezing, vomiting, seizing, and powerlifting and typically occurs on the neck and upper chest [1–3]. Valsalva purpura occurring on the face has rarely been reported in the pediatric literature. In the setting of blowing up balloons, one other case of Valsalva purpura has been reported, also facial but with a periocular distribution in a 10-year-old [4]. Forceful expiration required for pulmonary function testing has likewise resulted in facial purpura [4].

Purpura occurs secondary to the extravasation of red blood cells

into the dermis or mucous membranes [1,5]. Purpura is categorized based on the size of the lesion with petechiae defined as less than 2 mm in diameter. Causes of purpura can be divided into intravascular (coagulopathy and thrombocytopenia), vascular (infection, inflammation, and vascular defects), and extravascular (mechanical, immunological, and toxin-mediated) categories [2]. In the case of inflating a balloon, the mechanical maneuver of forceful expiration is thought to increase thoracic pressure resulting in capillary hypertension, capillary rupture, and extravasation of blood. In a report of Valsalva purpura attributed to power-lifting, this particular maneuver was shown to increase pressures in the arterial system to as high as 450/380 mm Hg [2].

Many underlying causes of capillary rupture initially manifest as petechiae in gravity-dependent areas, primarily the lower extremities. However, Valsalva purpura typically presents as petechiae above the level of the nipple on the chest and neck. The face is often spared, likely due in part to the rich vascular supply and few end-artery vessels preventing high pressure localized to one area [1]. Although the occurrence of facial Valsalva purpura is uncommon, the presentation may be more likely and more impressive in children taking medications known to increase the risk of bleeding, such as nonsteroidal anti-inflammatory drugs.

Although purpura in children can be associated with underlying systemic conditions requiring medical treatment, petechiae secondary to Valsalva-like maneuvers are self-limited, typically resolving in a few weeks without sequelae. Lesions may progress in color from red to purple to brownish yellow before eventually disappearing [1]. The occurrence of petechiae confined to the face should raise suspicion for a variant of Valsalva purpura. A detailed

* Corresponding author. 1004 Chafee Ave FH-100 Augusta GA, 30912, USA.

E-mail address: vmadray@augusta.edu (V.M. Madray).

Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.



Fig. 1. Multiple nonblanching red to violet macules extend from the oral commissures to the chin.

history is essential in making this diagnosis and should curtail the need for unnecessary diagnostic workup.

Ethical statement

Research conducted meets ethical guidelines. Images included in the manuscript are nonrecognizable, therefore informed consent met exemption criteria. None of the included authors have any financial or personal relationships with organizations that could influence the work completed.

Declaration of competing interest

None.

References

- [1] Goldman AC, Govindaraj S, Franco Jr RA, Lim J. Facial purpura. *Laryngoscope* 2001 Feb;111(2):207–12.
- [2] Pierson, Joseph C, and Philip S Suh. "Powerlifter's purpura: a valsalva-associated phenomenon." *Cutis*, vol. 70, no. 2, pp. 93–94.
- [3] Reis JJ, Kaplan PW. Postictal hemifacial purpura. *J Clin Neurophysiol* 1996;13(5): 448. <https://doi.org/10.1097/00004691-199609000-00058>.
- [4] Rifaioğlu E, Özlem E, Şen B, Doğramacı A. Facial purpura in a child after inflating a balloon. *J Turkish Acad Dermatol* 2014. <https://doi.org/10.6003/jtad.1481c3>.
- [5] Nakib S, Rani M. The differential diagnosis of purpura. In: Soutor C, Hordinsky MK, eds. *Clinical dermatology* New York, NY: McGraw-Hill; . <http://accessmedicine.mhmedical.com/content.aspx?bookid=2184§ionid=165461236>. Accessed October 20, 2019.