Subcorneal Hematomas in Excessive Video Game Play

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PRACTICE **POINTS**

- Video game play has been reported as an etiologic factor in multiple musculoskeletal and dermatologic conditions.
- More than two-thirds of US children aged 2 to 18 years live in a home with a video game system.
- Cognizance of the popularity of video games and related pathologies can be an asset for dermatologists who evaluate pediatric patients.

We report a case of subcorneal hematomas caused by excessive video game play in a 19-year-old man. The hematomas occurred in a setting of thrombocytopenia secondary to induction chemotherapy for acute myeloid leukemia. It was concluded that thrombocytopenia subsequent to prior friction from heavy use of a video game controller allowed for traumatic subcorneal hemorrhage of the hands. Using our case as a springboard, we summarize other reports with video game associated pathologies in the medical literature. Overall, cognizance of the popularity of video games and related pathologies can be an asset for dermatologists who evaluate pediatric patients.

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Case Report

A 19-year-old man was admitted to our hospital to begin treatment for acute myeloid leukemia that had been diagnosed 2 days prior. Three days after completing a 10-day regimen of induction chemotherapy, he developed bilateral, well-demarcated erythematous patches on the palmar surfaces of the proximal phalanges of the third, fourth, and fifth fingers (Figure 1) and 2 patches on the right

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Figure 1. Bilateral, well-demarcated erythematous patches on the palmar surfaces of the proximal phalanges of the third, fourth, and fifth fingers and on the right palm.

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palm. The patient was referred to dermatology for evaluation. He recalled no trauma to these sites although he reported pushing his intravenous pole with the right hand when walking. Of note, he had become neutropenic and thrombocytopenic following chemotherapy

On physical examination, the patches measured 1- to 1.5-cm in diameter and were mildly tender to palpation. The 2 patches on the right palm were much smaller than those on the fingers but were otherwise similar in appearance.

A punch biopsy of the erythematous lesion on the left third digit was performed. Histologic examination revealed extensive epidermal denudation associated with vascular proliferation and congestion as well as hemorrhage and a sparse lymphocytic infiltrate (Figures 2–4). There was no evidence of a leukemic infiltrate, and stains for fungal elements and bacteria were negative. Eccrine ducts appeared normal with no evidence of necrosis or metaplasia. These findings were suggestive of a frictional etiology.

Due to the distribution of the skin lesions on the hands, it was suspected that the source of friction was a video game controller. Although the patient denied playing video games since his admission to the hospital, he reported heavy video game use during the weeks prior to admission. We postulated that the thrombocytopenia the patient developed following chemotherapy along with prior friction injury sustained from heavy video game play led to traumatic subcorneal hemorrhage on the hands at the points of contact with the video game controller (Figure 5). The subcorneal hematomas resolved completely over the next 2 months during which the patient abstained from video game play.

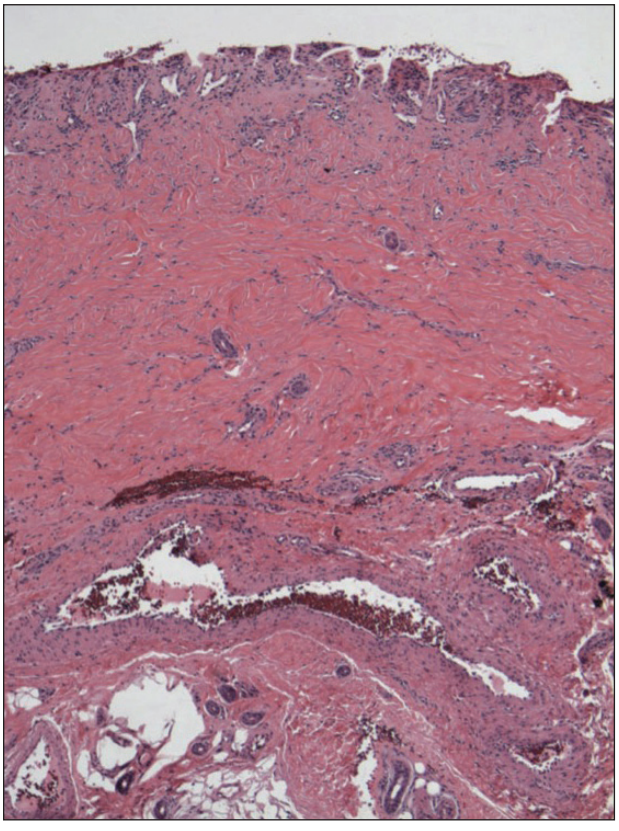

Figure 2. Loss of epidermis with prominent dermal papillae and minimal inflammation (H&E, original magnification ×4).

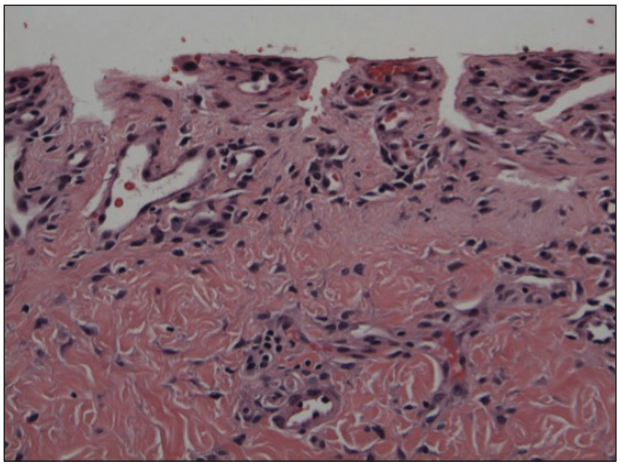

Figure 3. Loss of epidermis with preservation of dermal papillae. Vascular ectasia and congestion along with a paucicellular inflammatory infiltrate are noted (H&E, original magnification ×20).

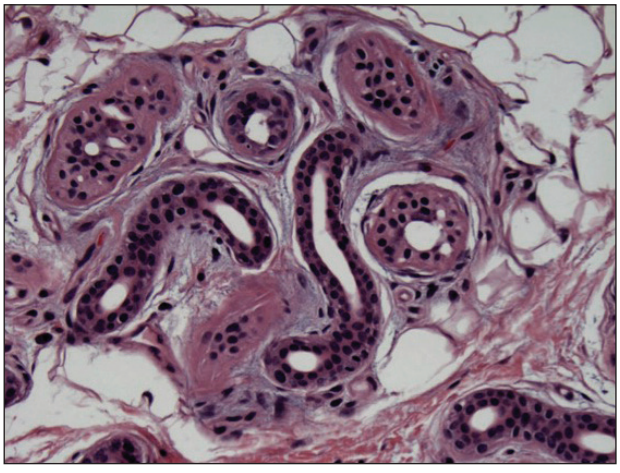

Figure 4. Eccrine sweat gland with normal secretory coils and excretory ducts. No inflammation or syringosquamous metaplasia were noted (H&E, original magnification ×20).

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Figure 5. Points of contact on the hands are demonstrated when holding a video game controller.

This case demonstrates the importance of obtaining a detailed patient history, as our patient's history of video game play prior to hospitalization proved to be of major diagnostic importance. Although the location, distribution, and well-demarcated nature of the patient's lesions suggested an external source of trauma and biopsy definitively ruled out leukemia cutis, Sweet syndrome, and eccrine hidradenitis,[1] the final diagnosis of traumatic subcorneal hematomas was only possible with specific knowledge of the patient's video game controller use.

Comment

History of video game play has been key to the diagnosis of a variety of cutaneous lesions documented in the medical literature. Robertson et al[2] attributed a similar case of traumatic subcorneal hematomas of the hands in an otherwise healthy 16-year-old boy to excessive use of a video game controller. Similarly, Kasraee et al[3] attributed a case of idiopathic eccrine hidradenitis in an otherwise healthy 12-year-old girl to excessive video game use. In both of these reported cases, bilateral skin lesions on the palms of the hands appeared acutely in a pattern consistent with the points of contact of a video game controller. Excessive video game play has also been associated with unilateral dermatologic lesions on the hands, such as knuckle pads,[4] onycholysis,[5] friction blisters,[6] pressure ulcers,[7] and hemorrhagic lesions.[5,6,8]

Video game–related pathologues are not limited to the skin and have been implicated in a variety of clinical presentations. In 1987, Osterman et al[9] published an early account of repetitive strain injury (RSI) related to video game use in which the investigators reported 2 cases of video game–related volar flexor tenosynovitis (or trigger finger), which they termed "joystick digit." Since that time, video game play has greatly evolved along with the types and nature of RSI cases reported in the medical literature. In 1990, Brasington[10] described acute tendinopathy of the extensor pollicis longus tendon caused by excessive video game play, which was termed "Nintendinitis." This term has since been used in reference to any video game–related RSI and reports have increased over time, likely due to the proliferation of an increasing array of video game systems.[5,11-16] In recent years, a number of traumatic injuries including fractures, joint dislocations, head injuries, hemothorax, and lacerations have been attributed to interactive gaming systems.[6,11,17-20] In rare cases, video game play also has been associated with enuresis,[21] encopresis,[22] and epilepsy.[23]

According to a 2011 report from the Entertainment Software Association, women over the age of 18 years now represent a greater proportion of the video game–playing population than boys aged 17 years and younger.[24] This same report also noted that the average video game player is 35 years old; 44% of all players are female; and 27% of Americans over the age of 50 years play video games. This shifting demographic data, including the fact that 80% of American households reportedly play video games, reveals the expanding depth and breadth of the market.[24] However, the pediatric population is still a high-volume player demographic. Average time per session peaks between 10 to 12 years of age and then falls through the teenage and adults years.[24] Hence, the pediatric population is at high risk for clinical pathology because of the increased repetitive movements associated with video game play. Overall, cognizance of the popularity of video games and related pathologies can be an asset for dermatologists who evaluate pediatric patients.

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