Pseudoxanthoma Elasticum in Flexural and Non-Flexural Folds: A Case Presentation and Discussion

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Abstract

Pseudoxanthoma elasticum is a rare, inherited connective-tissue disorder. Characteristic cutaneous and biopsy findings typically lend to diagnosis by dermatologists. The presentation can be subtle or striking, and the disorder can involve multiple organ systems. Here we highlight an atypical cutaneous presentation of pseudoxanthoma elasticum and provide a discussion on the pathogenesis and characteristics of the disorder.

Introduction

Pseudoxanthoma elasticum, also known as Grönblad-Strandberg syndrome, is an autosomal-recessive connective-tissue disorder that results in abnormal mineralization of elastic fibers. The disease often manifests in the skin, the cardiovascular system, and the eyes. Skin findings typically occur in flexural folds and have a characteristic xanthomatous appearance; herein, we present a case of pseudoxanthoma elasticum with extensive skin involvement not limited to flexural folds.

Case Presentation

A 61-year-old male presented to our clinic for a routine skin check. Upon removal of his shirt, the patient’s skin was remarkable for many redundant folds; the patient denied any history of extreme weight loss. The patient’s redundant skin was diffusely distributed to his neck, underarms, thorax, abdomen, and mid to lower back. Very little of his upper body was spared aside from his upper back and face (Figures 1, 2). Upon closer examination, the skin revealed small yellow papules characteristic of a “plucked chicken skin” appearance (Figures 3, 4). The patient stated he began noticing increased sagging of his skin in his third decade of life and was subsequently diagnosed with pseudoxanthoma elasticum (PXE). Due to the extensive sagging and unique distribution of cutaneous changes, we obtained a 4 mm punch biopsy of the left abdomen to confirm his diagnosis. Biopsy revealed clumped...
and distorted elastic fibers in the reticular dermis consistent with PXE (Figure 5).

At this point, a detailed history was obtained with particular emphasis on family history and the multisystem manifestations of PXE. The patient denied any family members with known PXE or similar cutaneous manifestations; therefore, an autosomal-recessive pattern of inheritance was deemed likely. The patient also denied a history of early-onset hypertension, peripheral vascular disease, myocardial infarction, gastrointestinal bleeding, or loss of vision. He had a one-year history of hypertension and hyperlipidemia being treated with losartan and pravastatin, respectively. The patient was married and manufactured ophthalmological equipment. He had a history of tobacco use but quit in 1978. He drank two to four beers per day. He exercised 3-4 times per week at a gym for two hours at a time. When asked whether PXE had negatively affected his health, the patient stated, “If anything, I have gone out of my way to stay in shape because I have PXE.” The patient continues to be seen for routine dermatologic care and has been informed of the need to monitor for extracutaneous manifestations of PXE as no specific disease-modifying treatments are available.

Discussion

Pseudoxanthoma elasticum is an inherited disorder that results in abnormal calcification of elastic fibers in connective tissue. The manifestations of the disease vary with the extent of connective-tissue involvement. The skin, cardiovascular system, and eyes are most commonly affected by the increased mineralization and deterioration of elastic fibers.

The prevalence of PXE is estimated to range between 1:25,000 to 1:100,000 with a slight female predominance. Both autosomal-dominant and autosomal-recessive modes of inheritance have been described; however, recent studies have refuted autosomal-dominant transmission and deemed the disease as strictly autosomal-recessive. The pathogenesis is rooted in a mutation of the adenosine triphosphate–binding cassette subfamily C member 6 (ABCC6) transporter gene on the short arm of chromosome 16p13.1. The ABCC6 transporter is found predominantly on the basolateral surface of hepatocytes and is hypothesized to serve as an efflux pump for the anti-mineralization proteins fetuin-A and matrix Gla. Therefore, loss of function of this pump results in an imbalance between anti-mineralization protection and mineral deposition. The result is increased calcification and fragmentation of elastic fibers in the aforementioned organ systems.

The integumentary manifestations of PXE typically present in the patient’s second or third decade of life, which accounts for a delay in diagnosis. The skin findings are classically described as being symmetric and limited to flexural folds and intertriginous areas. However, as in our case, extensive involvement beyond the typical distribution of PXE can occur. Visible to the naked eye are white-yellow papules that appear xanthomatous, hence the term “pseudoxanthoma,” which coalesce to give the appearance of “plucked chicken skin.” Over time, the skin becomes more lax due to lack of elastic recoil, and redundant skin folds can be seen. The dermatologic findings of PXE support a differential diagnosis that includes actinic elastosis, cutis laxa, and Ehlers-Danlos syndrome. Histologically, distorted and fragmented elastic fibers are seen in the mid to deep reticular dermis with sparing of the papillary dermis, a finding characteristic of PXE.

The vascular manifestations of PXE vary greatly and can alter the prognosis of affected patients. Abnormal calcification in the media of medium-sized vessels can predispose to accelerated coronary artery disease as well as peripheral arterial disease. Patients with known PXE should have regular visits with their primary care physician and be counseled on minimizing modifiable risk factors such as smoking.

Although they are not pathognomonic for the disease, angioid streaks are the most common ocular manifestation of PXE. Our patient was able to provide us with images of his retina from 2004 displaying this classic finding (Figure 6). The streaks are a result of breaks in the elastic-fiber layer of Bruch’s membrane, the innermost layer of the choroid. While angioid streaks are often benign, neovascularization and subsequent hemorrhage can result in worsening vision and possible blindness. Therefore, patients with PXE should receive routine ophthalmologic care as well.

Conclusion

To date, there is no cure for pseudoxanthoma elasticum. Management of the condition lies in frequent monitoring for the extracutaneous manifestations of the disease as they can worsen the prognosis. While the cutaneous manifestations may seem striking to the patient, the functional capacity and integrity of the skin are not compromised. Patients should continue to see a dermatologist for annual skin checks; however, advanced precautions to protect the skin need not be taken. Treatment is deemed cosmetic and entails surgical removal of redundant skin folds by a plastic surgeon.

References


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