·Case Report·

Choroidal neovascularization and angioid streaks in pseudoxanthoma elasticum

Melisa Nika, Cagri G Besirli

Department of Ophthalmology and Visual Sciences, University of Michigan Medical School, Ann Arbor, Michigan, Kellogg Eye Center, 1000 Wall Street, Ann Arbor, MI 48105, USA

Correspondence to: Cagri G Besirli. Department of Ophthalmology and Visual Sciences, University of Michigan Medical School, Ann Arbor, Michigan, Kellogg Eye Center, 1000 Wall Street, Ann Arbor, MI 48105, USA. cbesirli@med.umich.edu

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Abstract

• AIM: To report a case of pseudoxanthoma elasticum (PXE) in a 48 year old woman that presented with bilateral blurry vision.

• METHODS: A case report

• RESULTS: A 48-year-old woman presented with bilateral blurry vision and right eye metamorphopsia. The patient had a history of angioid streaks in the left eye ten years ago for which she had received laser surgery and had poor residual vision. Visual acuity was 20/60 in the right eye and count fingers at 6 feet in the left. Fundus examination showed subretinal hemorrhage and macular thickening on the right and a disciform macular scar with focal atrophic pigment epithelial lesions on the left. Both eyes had angioid streaks and *peau d'orange* pigmentary pattern of the retina. External examination showed several, yellow skin papules and plaques on the lateral and posterior neck, as well as prominent mental creases. Pathologic examination of skin biopsy confirmed the diagnosis of PXE, showing calcium deposition and fragmented, clumped elastic fibers in the deep reticular dermis. She responded well to intravitreal bevacizumab injections and visual acuity improved to 20/25 OD. Preventative care was emphasized and the patient was referred to cardiology, gastroenterology and human genetics for counseling.

• CONCLUSION: PXE is a multisystem disorder affecting the dermatologic, ocular, and cardiovascular systems. Ophthalmic findings of angioid streaks and choroidal neovascularization in the presence of stereotypical skin changes and prominent mental creases should prompt evaluation for PXE.

• KEYWORDS: angioid streaks; pseudoxanthoma elasticum; *peau d'orange*

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INTRODUCTION

Pseudoxanthoma elasticum (PXE) is a multisystem disorder affecting the tegumentary, ocular, and cardiovascular systems. It is characterized by progressive calcification and fragmentation of elastic fibers [1, 2]. Early recognition is essential for decreasing the risk of systemic complications.

CASE REPORT

A 48-year-old woman presented with bilateral blurry vision and right eye metamorphopsia of one week duration. She had no associated symptoms. The patient had a history of angioid streaks in the left eye ten years ago for which she had received laser treatment and had poor residual vision.

On ocular examination, her visual acuity was 20/60 in the right eye and count fingers at 6 feet on the left. Visual fields examination was full to counting fingers. Anterior segment examination showed quiet anterior chambers bilaterally. Fundus examination showed subretinal hemorrhage and macular thickening on the right (Figure 1) and a disciform macular scar (Figure 2) with focal atrophic pigment epithelial lesions on the left. Both eyes had angioid streaks (arrowheads) and *peau d'orange* pigmentary pattern of the retina (stars). External examination showed several, yellow skin papules and plaques on the lateral and posterior neck (Figure 3). The patient was noted to have prominent mental creases (Figure 4).

Based on ocular and dermatologic findings, the patient was clinically diagnosed with PXE. Pathologic examination of a skin biopsy specimen from her neck showed calcium deposition (Figure 5) and fragmented, clumped elastic fibers in the deep reticular dermis (Figure 6), confirming the diagnosis of PXE.

The patient received intravitreal bevacizumab injections every six weeks and visual acuity improved to 20/25 in the right eye. Preventative care was emphasized and she was referred to cardiology, gastroenterology, and genetic counseling.

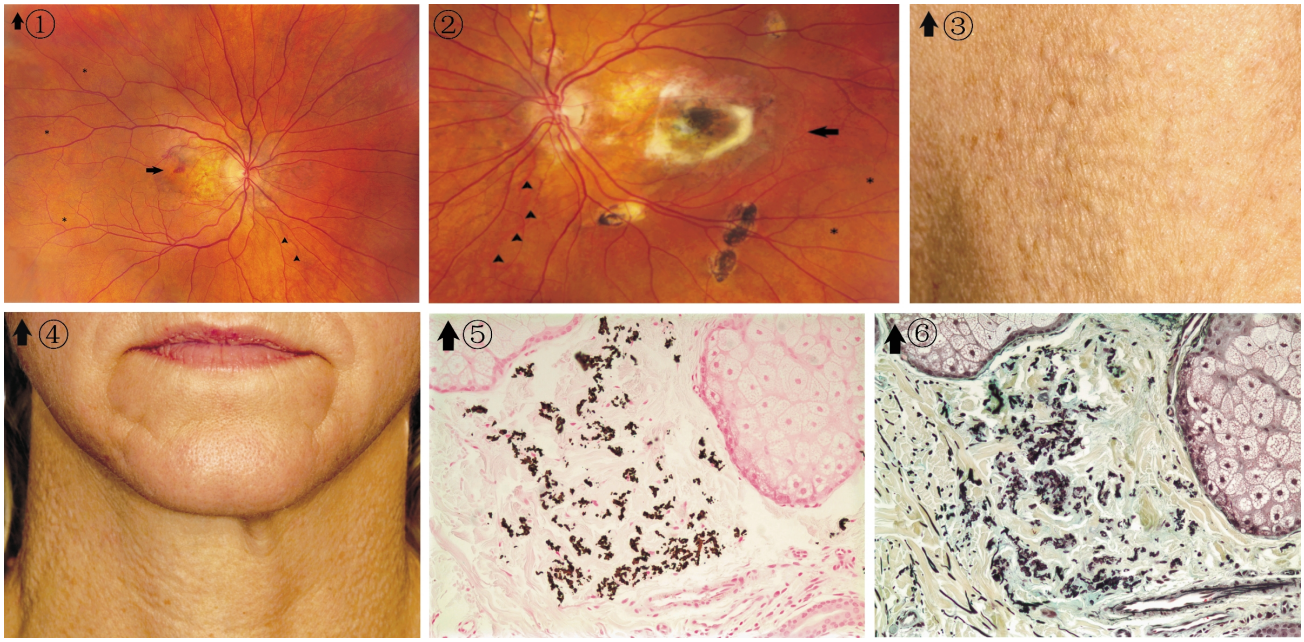

Figure 1 The right eye: subretinal hemorrhage (arrow), angioid streaks (arrowheads), peau d´orange pigmentary pattern of the retina (stars)

Figure 2 The left eye: disciform macular scar (arrow), angioid streaks (arrowheads), peau d´orange pigmentary pattern of the retina (stars)

Figure 3 Lateral neck: several skin papules

Figure 4 Prominent mental creases

Figure 5 Calcium deposition in the deep reticular dermis (Von kossa stain 40x magnification)

Figure 6 Fragmented clumped elastic fibers in the deep reticular dermis (Movat stain 40x magnification)

DISCUSSION

PXE is an inherited disorder that affects the dermatologic, ocular, and cardiovascular systems. It is characterized by degeneration and fragmentation of elastic fibers due to progressive calcification[1, 3]. Recent studies suggest that PXE is inherited in an autosomal recessive fashion. Mutations in the ABCC6 gene on chromosome 16p13.1 have been connected to the disease. ABCC6 gene encodes multidrug resistance associated protein 6 (MRP6), a transmembrane transporter protein with no known exact biological function[3, 4]. Faulty expression of MRP6 results in accumulation of substances with an affinity for elastic fibers, which causes clumping of elastic fibers in target tissues and calcium deposition.

In skin the pathology happens mostly in the deep reticular dermis. This leads to cutaneous lesions with the appearance of small yellow papules that may coalesce into plaques giving the skin a "plucked chicken" appearance and typically develop on the neck and flexural areas[2]. Recently, Lebwohl *et al* [5] reported the strong association of prominent mental creases and PXE. This stereotypical skin finding was very prominent in our patient and increased our clinical suspicion for the diagnosis of PXE in this case.

The characteristic ocular sign, angioid streaks, results from degeneration and calcification of the elastic fibers of the retina leading to breaks in Bruch's membrane. This can lead to choroidal neovascularization (CNV), subretinal and retinal hemorrhages, progressive visual loss and legal blindness. Typical age of onset of angioid streaks is between 15 and 25 years. However, the first ocular sign is often *peau d'orange* appearance of the retina, which may precede angioid streaks by 10 years[6].

Cardiovascular manifestations, due to calcium deposition and degeneration of elastic laminae of medium sized arteries, comprise a serious aspect of the disease process. Clinically this may present as intermittent claudication, renovascular hypertension, coronary artery disease, stroke, mitral valve stenosis or prolapse. Gastrointestinal hemorrhage is experienced by approximately 10% of PXE patients, due to the brittle calcified submucosal vessels[7, 8].

It is of paramount importance to recognize PXE early, in order to reduce morbidity and mortality from systemic complications. Ophthalmic findings of angioid streaks and choroidal neovascularization in the presence of stereotypical skin changes and prominent mental creases should prompt evaluation for PXE.

Management requires a multidisciplinary approach (dermatologist, primary care physician, ophthalmologist,

cardiologist, medical geneticists), routine examination by a retina specialist, regular use of the Amsler grid, routine physical examination with attention to the cardiovascular system, periodic monitoring of serum lipids and for gastrointestinal bleeding[1,2,9].

Therapeutic approaches for ocular complications include laser photocoagulation and intravitreal injections of vascular endothelial growth factor (VEGF) inhibitors. Laser photocoagulation has been shown to arrest the progression of CNV, however this has been associated with a high rate of recurrence as well as scarring and subsequent vision loss[10]. As demonstrated in our patient, repeated intravitreal injections of anti-VEGF, such as bevacizumab and ranibizumab, have been shown to be effective in treating CNVs, preserving and recovering vision[11-13].

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