

Choroidal neovascularization and angioid streaks in pseudoxanthoma elasticum

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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.

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*

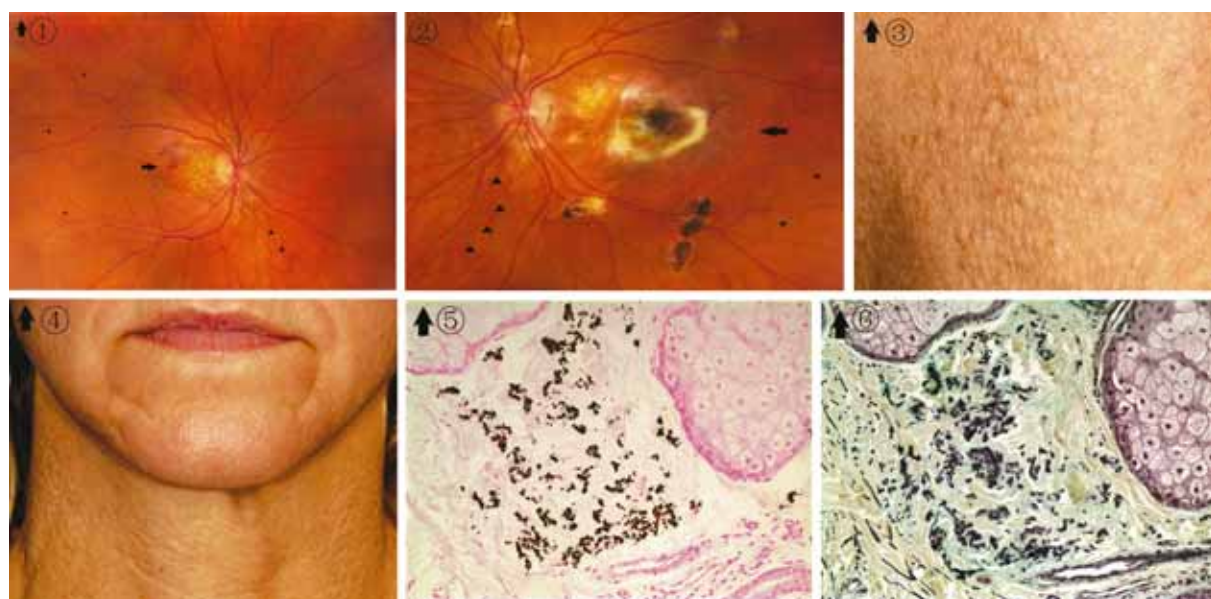


Figure 1 The right eye: subretinal hemorrhage (arrow), angioid streaks (arrowheads), *peau d'orange* pigmentary pattern of the retina (stars).

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, Lebowitz *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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弹性假黄瘤的脉络膜新生血管和血管样条纹症

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摘要

目的:报告1例表现为双眼视力模糊的48岁女子患弹性假黄瘤病(pseudoxanthoma elasticum, PXE)的病例。

方法:病例报告。

结果:患者,女,48岁,双眼视力模糊,右眼视物变形。10a前因左眼患血管样条纹症接受激光手术,残余视力较差。右眼视力为20/60,左眼6英尺数指。眼底检查可见视网膜下出血和右侧黄斑增厚及左侧椭圆形黄斑瘢痕伴病灶萎缩性色素上皮病变。双眼有血管样条纹和橙色视网膜色素图案。外部检查发现颈部侧面和后面有几处黄色皮肤丘疹和斑块,以及明显的颈皱褶。皮肤切片病理检查证实了PXE的诊断,显示有网状真皮层深层的钙沉积和成碎片的成丛的弹性纤维。患者对玻璃体内注射贝伐单抗反应良好,右眼视力提高到20/25。强调预防保健的重要性,建议患者求助于心脏病学、胃肠病学和人类遗传学咨询服务。

结论:PXE是一个累及多系统的疾病,它影响着皮肤、眼和心血管系统。在固有的皮肤变化和明显的颈皱褶的存在下,血管样条纹症和脉络膜新生血管的眼科发现能提高PXE的评估。

关键词:血管样条纹症;弹性假黄瘤;橘皮样变