***no patient handout*

Pseudoxanthoma elasticum

Contributors: Belinda Tan MD, PhD, Noah Craft MD, PhD, Lindy P. Fox MD, Lowell A. Goldsmith MD, MPH, Michael D. Tharp MD

Synopsis

Pseudoxanthoma elasticum (PXE) is an inherited disorder of abnormal calcification affecting elastic fibers in the dermis, retina, and cardiovascular system. PXE is inherited in autosomal recessive fashion. The basic defect is in the ABCC6 gene, which codes for a cellular transport protein. However, the exact relation between the genetic defect and the phenotype remains to be determined. A correlation of the severity of PXE with high calcium intake has been suggested.

Cutaneous lesions often begin in childhood as "leathery" skin at flexural sites but may not be noted until adolescence due to their asymptomatic nature. The disorder is frequently undiagnosed until the third or fourth decade of life. A retinal elastic lamina change, called the angioid streak, is a characteristic of the condition. It appears later than the skin changes but is present in nearly 100% of patients by age 30. Retinal hemorrhages, leading to central vision loss, and GI hemorrhages are potential complications of the disease. Patients may also have hypertension, mitral valve prolapse, and accelerated atherosclerosis. For unknown reasons, PXE is more common in women. There is no known predilection for any ethnicity.

For more information, see **OMIM**.

Codes

ICD10CM:
Q82.8 – Other specified congenital malformations of skin

SNOMEDCT:
252246005 – Pseudoxanthoma elasticum

Look For

Small, yellowish papules and plaques that cover the sides of the neck, axillae, the antecubital and popliteal spaces as well as the inguinal and periumbilical areas in a linear or reticular pattern; these papules frequently clinically resemble "plucked chicken skin." Lesions tend to be symmetrical. Mucous membranes, such as the inner lip, rectum, and vagina may demonstrate yellowish papules. Patients may have perforating lesions such as elastosis perforans serpiginosa, which presents with multiple papules with an irregular, protruding core that represents elastic tissue being eliminated from the skin. Late laxity of skin is typical, especially in flexural areas.

Angioid streaks are dark red or gray streaks seen beneath normal retinal blood vessels. The streaks radiate outward from around the optic disc.

Diagnostic Pearls

As the disease process continues, the skin of the neck, axillae, and groin may become soft, lax, wrinkled, and hang in folds.

Differential Diagnosis & Pitfalls

- Severe photodamage (**solar elastosis**)
- Poikiloderma (see **poikiloderma of Civatte**, **poikiloderma vasculare atrophicans**)
- **Cutis laxa**
- **Ehlers-Danlos syndrome**
- **Elastosis perforans serpiginosa**
- **Buschke-Ollendorff syndrome** (dermatofibrosis lenticularis)
- **Marfan syndrome**
- Acquired pseudoxanthoma elasticum
- **Focal dermal hypoplasia**
- Elastoderma
- **Xanthomas**
- White fibrous papulosis of the neck
- Granulomatous slack skin / **cutaneous T-cell lymphoma**

Best Tests

A skin biopsy is the gold standard for diagnosis. A biopsy of a scar or normal-appearing skin may be diagnostic in patients without typical skin findings.

Histopathology Findings:
DIAGNOSTIC

- Clumped and frayed calcified elastic fibers in the reticular dermis (pink or blue squiggles)
- Elastic tissue (Verhoeff-Van Gieson) and calcium (von Kossa or alizarin red) stains highlight the distorted elastic fibers

Further work-up and preventative measures are as follows:

- Blood pressure assessment and monitoring.
- Hematology and complete fasting lipid profile.
- Fecal occult blood test.
- Serum chemistries, include complete liver and kidney profiles.
- Funduscopic exam with retinal photos. Patients should regularly test themselves using an Amsler grid. Repeat funduscopic exam annually or biannually.
- Doppler ankle-brachial index (ABI) measurements are indicated in patients with claudication.
- Perform echocardiography for patients with a heart murmur.

Management Pearls

Because of the eye lesions, contact sports and heavy lifting/straining are not recommended for patients with PXE.

Advise smoking cessation, when applicable. Tobacco may exacerbate the disease course. Optimize the management of any concomitant hypertension or lipid abnormalities. Patients should also be advised to avoid excess alcohol use.

Diet and exercise are also important. Patients should follow a heart-healthy diet and restrict their dietary calcium intake to 800 mg/day.

PXE patients *must* be routinely followed by an ophthalmologist. The viewing of wavy lines on an Amsler grid should prompt immediate ophthalmologic evaluation.

Offer genetic counseling to patients and their family members. Patients with gastrointestinal hemorrhage should be seen by a gastroenterologist; likewise, patients with cardiovascular manifestations should be followed by a cardiologist.

Therapy

Risk factor modification and preventative measures as above.

A low-calcium and phosphorus diet may be beneficial (800 mg calcium/day).

Patients should avoid the use of any anticoagulants or anti-platelet agents long term.

Pentoxifylline (400 mg p.o. before each meal) is occasionally prescribed to patients with claudication.

Patients with mitral valve insufficiency require prophylactic antibiotics prior to dental and surgical procedures.

There is no specific treatment for the skin findings of PXE. Plastic surgery to remove lax skin often achieves good cosmetic results.

There is anecdotal evidence that certain vitamin and mineral supplements may be advantageous in retinal disease (vitamins A, C, E, zinc, selenium, and copper).