Plain Language Summary

Developing pseudoxanthoma elasticum following a liver or kidney transplant

Plain language summary by William Berndtson, PXE International Volunteer

Study at a Glance

Title: Acquired Pseudoxanthoma Elasticum Presenting After Liver Transplantation

Lead Institution: PXE International

Collaborating Institutions: Brown University (USA), University of Angers (France), University of Toulouse (France), National Human Genome Research Institute (USA), University of Montpelier (France), University of Ghent (France)

Study Type: Case study

Date of the paper publication: 2011

Citation: *Bercovitch L, Martin L, Chassaing N, Hefferon TW, Bessis D, Vanakker O, Terry SF. Acquired pseudoxanthoma elasticum presenting after liver transplantation. J Am Acad Dermatol. 2011 May;64(5):873-8. doi: 10.1016/j.jaad.2010.03.030. Epub 2011 Mar 12. PMID: 21397982; PMCID: PMC3078966.*

Summary:
Pseudoxanthoma elasticum (PXE) is a genetic disorder resulting in abnormal calcification in soft tissues primarily of the skin, arteries, and eyes. It is a progressive disease-causing skin lesions, mineralization of the membrane behind the eye, and mid-sized arteries. It is caused by two mutations in both copies of the *ABCC6* gene, which is found predominantly in the liver and kidneys. This leads to a lower-than-average level of inorganic pyrophosphate (PPi). PPi

This study considered three transplant recipients who developed PXE after receiving a liver transplant. The assessment aimed to explore whether their PXE might be linked to the donor organ. To assess this possibility, the three people underwent clinical and ophthalmological

exams, skin biopsy for histopathological examination, and genetic testing. Family histories were reviewed and clinical exams and genetic testing were performed on available parents and siblings. Tissue samples were available from two livers and one kidney. These were examined for mineralization and for *ABCC6* mutations.

Each of the three transplant recipients had signs of PXE, and their tissue showed mineralization like people with PXE, even though they had no mutations in their *ABCC6* gene. None of their family members had evidence of either PXE or *ABCC6* gene mutations. None of the donor tissues had an *ABCC6* mutation. Of the three transplanted livers, tissue from one was unavailable while the DNA of a second was of poor quality. In addition to the limited genetic testing available, the authors also noted that genetic testing does not detect *ABCC6* mutations in about 10% of individuals with confirmed PXE, and so it was possible that they had undetectable mutations. Interestingly, one of the subjects in this study received a donor liver transplant when 6 years old and began to develop PXE-related skin changes at age 12. Because the transplanted liver had never functioned well, in 2004, when she was 17 years old, she received another liver transplant, this time from her mother. Skin changes progressed for about two years after that second transplant but have remained stable thereafter.

PXE had not been reported previously following liver transplantation. Although *ABCC6* mutations were not detected in the limited donor organ tissues available, their presence cannot be excluded. Both the timing of the post-operative development of PXE in individuals without *ABCC6* mutations and the apparent cessation of calcification in the skin of one individual after removal of that donor liver and replacement with another would further support the possibility that PXE can be introduced via transplanted liver or kidney if the organ comes from a donor affected by PXE. If we can transplant a liver or kidney from a “PXE mouse” into a mouse without PXE, we might be able to observe whether the transplanted organ will cause PXE.

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