

SKINimages

Exophytic, Pedunculated, Yellow-Orange Nodules on the Elbows

Fareen Momin, BBA¹, Ayezel Munoz, MD², Kathleen T. Kroger, MD²

¹ The University of Texas Medical Branch at Galveston, School of Medicine

² The University of Texas Medical Branch at Galveston, Department of Dermatology



A 38-year-old female with type II diabetes and mixed dyslipidemia presented to the dermatology clinic with asymptomatic, growing nodules on her elbows that originally presented during adolescence. The patient disliked the appearance, and the size was becoming cumbersome, frequently getting hit by furniture, prompting her to see a dermatologist. She denied history of diarrhea, cataracts, neurological symptoms, pain, bleeding, or itching. Family history was positive for coronary artery disease in the father and similar, keloidal growths on the knees in the sister but neither had prior

genetic testing. On physical examination, exophytic, pedunculated, yellow-orange nodules were present on the right (**Figure 1**) and left (**Figure 2**) elbows. Labs revealed an LDL of 178 mg/dL, triglycerides of 211 mg/dL, and cholesterol of 266 mg/dL. Biopsy of the left elbow revealed tuberous xanthoma. The patient had genetic testing, revealing two rare pathogenic autosomal recessive, heterozygous mutations in the CYP27A1 gene, diagnosing her with cerebrotendinous xanthomatosis (CTX).

CTX is caused by a mutation in the CYP27A1 gene that codes for a mitochondrial enzyme 27-hydroxylase that converts cholesterol to bile acids.¹ This defect leads to elevated bile acid precursors that get stored in tendons, lenses or the central nervous system.^{1,2} The incidence of CTX in Americans is estimated to be between 1 in 72,000 to 1 in 150,000. CTX can affect the gastrointestinal, ocular, and neurologic systems.³ Patients may present with infantile-onset diarrhea, juvenile-onset cataracts, tendon xanthomas, and neurologic impairments including ataxia and peripheral neuropathy.^{3,4}

Tendon xanthomas typically present in the second or third decade of life commonly affecting the Achilles tendon, extensor tendon of elbow and hands, and patellar tendons.^{3,4} Histopathology findings of tendons show dense connective tissue replaced with foamy histiocytes, multinucleated giant cells, and elongated cholesterol clefts.³ In new, early lesions, slight admixture of non-foamy cells with lymphoid cells, histiocytes, and neutrophils can be identified.² In mature, well-developed lesions, abundant foam cells are present.²

Our patient was advised to follow-up with her PCP to monitor lipid levels. She was referred to plastic surgery for removal of lesions, but canceled surgery for unknown reasons. Our case is unique in that the patient's only complaint was the growing nodules on bilateral elbows. Differentials considered in this case included familial dysbetalipoproteinemia and familial hypercholesterolemia. Inquiring about the moderately elevated lipid levels and the tuberous xanthomas on the elbows allowed the patient to successfully attain genetic testing to identify her diagnosis of CTX. Diagnosing the patient with CTX was vital as management of this disease is different from

solely managing elevated lipid levels.

A median 16-year delay between the initial symptom presentation to diagnosis of CTX is seen in patients.³ Variation in symptoms and age of onset makes diagnosing CTX difficult.³ Therefore, by understanding the clinical presentation of CTX, dermatologists can prompt diagnosis and play a vital role in reducing future risk of neurologic and cardiac damage, thereby increasing life expectancy in these patients.³ The findings of this case increase awareness of the condition and promote early interdisciplinary care to better patients' quality of life.

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Corresponding Author:

Fareen Momin
4407 Pine Blossom Trail
Houston, TX 77059
713-261-3264
Email: faamomin@utmb.edu

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