# Dysbetalipoproteinemia : a case report and review of the literature.

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**ABSTRACT:**

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Dysbetalipoproteinemia is a rare familial hypercholesterolemia defined by accumulation of chylomicron remnants and very-low-density lipoprotein remnants due to presence of abnormal isoform of apo-E, named apo-E2, that impaired liver uptake. We reported a case presenting with palmar xanthoma that is a characteristic cutaneous sign of this condition. Serum cholesterol and triglyceride of the patient are equally elevated that is typical to dysbetalipoproteinemia.

**Key words:** Dysbetalipoproteinemia, typer III hyperlipoproteinemia, palmar xanthoma, xanthoma striatum palmare

**บทคัดย่อ:**

**นภัทร โตวณะบุตร นภดล นพคุณ รายงานผู้ป่วยโรค DYSBETALIPOPROTEINEMIA วารสารโรคผิวหนัง 2554; 27:317-319.**

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Dysbetalipoproteinemia เป็นโรคไขมันในหลอดเลือดสูงทางพันธุกรรมที่เกิดจากการคั่งของ chylomicron remnants และ very-low-density lipoprotein remnants เนื่องจากมี apo-E ที่ผิดปกติเรียกว่า apo-E2 ซึ่งไม่สามารถกำจัดทางตับได้ รายงานฉบับนี้ได้นำเสนอผู้ป่วยที่ผื่นไขมันสะสมใต้ผิวหนังบริเวณฝ่ามือและตรวจเลือดพบว่าไขมันโคเลสเตอรอลและไตรกลีเซอไรด์เพิ่มสูงขึ้นในปริมาณเท่าๆ กันซึ่งเป็นลักษณะเฉพาะของโรค dysbetalipoproteinemia

**คำสำคัญ** : โรคไขมันในหลอดเลือดสูงทางพันธุกรรมชนิดที่ 3, ผื่นไขมันสะสมใต้ผิวหนัง

**Case report**

A 44 year-old Thai man presented with multiple yellowish papules on volar side of fingers for 3 months. He also had yellowish papules along the palmar creases and two yellowish nodules on right elbow. He had no family history of diabetes mellitus, hyperlipidemia and coronary artery disease. Physical examination showed multiple yellowish papules on volar side of fingers (figure 1) and along the palmar creases. Two yellowish nodules were observed on right elbow. There were neither hepatosplenomegaly nor lymphadenopathy. Laboratory investigation revealed total cholesterol 519 mg/dL (normal 150-220 mg/dL), low-density-lipoprotein (LDL) cholesterol 326 mg/dL (normal <150 mg/dL) and triglyceride 520 mg/dL (normal 40-155 mg/dL). Fasting blood sugar was normal (89 mg/dL). Skin biopsy from papule from finger showed hyperkeratosis and irregular acanthosis of the epidermis. There was focal infiltration of foamy histiocytes and epitheloid cells within dermal papillae and upper dermis (figure 2). He was diagnosed as palmar xanthoma from dysbetalipoproteinemia. The patient was treated with diet therapy and simvastatin 40 mg/day.

**Discussion**

Xanthomas are lesions characterized by accumulations of lipid-laden macrophages. They are commonly associated with lipid disorders or paraproteinemia. Xanthomas develop primary due to lipid leakage from the vasculature into surrounding tissues, where macrophages phagocytize these lipids and lead to formation of 'foamy macrophages'. At least six different types of xanthomas have been identified. These include xanthelasma palpebrarum, eruptive xanthomas, planar xanthomas, tuberous xanthomas, tendinous xanthomas, and verruciform xanthoma[1].

**Figure 1** Multiple yellowish papules on volar side of fingers

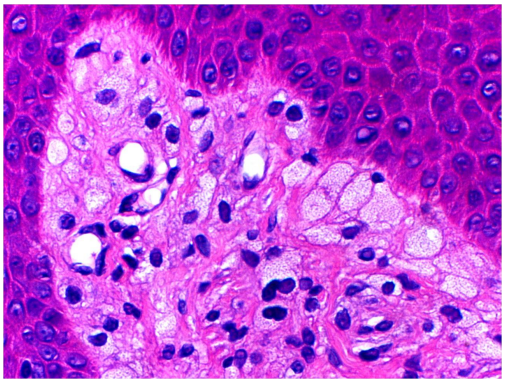

**Figure 2** Infiltration of foamy histiocytes and epitheloid cells within dermal papillae

The lesions on both hands of our patient consistent with planar xanthoma of the palmar creases or xanthoma striatum palmare and lesions on elbows are tuberous xanthomas. These xanthomas are the characteristic of dysbetalipoproteinemia which serum cholesterol and triglyceride are equally raised as seen in this patient. The lesions of our patient are not compatible with eruptive xanthomas in which serum triglyceride must be over 1,000 mg/dL. A hypothesis for the formation of planar xanthomas in the palms suggested that minor trauma in pressure loading areas leads to increased vascular permeability, increased leakage of lipids, and eventual planar xanthomas formation. In addition to primary hyperlipidemia, planar xanthomas may be associated with cholestasis and monoclonal gammopathy, including multiple myeloma or a lymphoproliferative disorder[2,3].

Dysbetalipoproteinemia (type III hyperlipoproteinemia) is a rare genetic lipoprotein disorder characterized by an accumulation in plasma of remnant lipoprotein particles (i.e., chylomicron remnants and very-low-density lipoprotein (VLDL) remnants). Cardiovascular risk in patients with this disease is clearly increased. The majority of patients are homozygous for the apoprotein E2 variant which reduce binding of chylomicron remnants and intermediate-density-lipoproteins to hepatic apoprotein E and LDL receptors respectively, leading their accumulation. Typically, serum cholesterol and triglycerides are approximately equally raised such as our patient. The cholesterol to triglyceride ratio in the VLDL fraction usually exceed 0.30. In a normal population, the prevalence of the apo E-2/2 genotype is approximately 0.7-1.0%. Type III hyperlipoproteinaemia is seen in approximately 1% of subjects bearing the apo E-2/2 genotype. The reasons for the relative rarity of type III hyperlipoproteinaemia is not fully understood[4]. An additional inherited or acquired lipid disorder may be required. The hyperlipidemia generally responds well to diet therapy, fibric acids or nicotinic acid. However, if total cholesterol levels are markedly raised, statin therapy is more effective. Reducing serum lipids with drug therapy often causes xanthoma regression[5].

In conclusion, the diagnosis of our patient is dysbetalipoproteinemia because he had two characteristic xanthomas, planar xanthoma of the palmar creases and tuberous xanthomas and serum cholesterol and triglyceride are equally elevated.

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