Cerebrotendinous xanthomatosis.
Case report

Bacchi O., Stefanucci S., Brustenghi P.L., Pagliacci A., Bellanti G.M.
Unità Organica di Neurologia-Foligno

We report a case of cerebrotendinous xanthomatosis in a 53 year old woman with details of the neurophysiological and neuroradiological findings, gross anatomy and histology.

Key Words: Cerebrotendinous xanthomatosis

Introduction

Cerebrotendinous xanthogranulomatosis (CTX) is a rare autosomal recessive disease (there are only about 100 reported cases in the world), first described by van Bogaert et al. in 1937, characterized by a genetic defect of the metabolism of the bile acids. There is consequently an increase of cholestanol in the plasma, cerebrospinal fluid and tissues, and insufficient synthesis of bile due to the total absence of chenodeoxycholic acid and hence excretion of considerable quantities of bile alcohols (precursors of the bile acids) conjugated with glucuronic acid. The clinical features of the disease are early cataract, mental retardation, cerebellar ataxia, peripheral neuropathy and tendinous xanthomas.

Case report

This 53 year old illiterate single woman came to observation for diagnosis of a protean clinical pattern characterized by marked ataxia, severe mental deterioration and multiple tendon swellings found on two previous admissions (Fig. 1). The family history revealed uncertain paternity, five brothers and two sisters reportedly free from similar disease and deformities, and the mother living and in apparent good health. The patient learned to speak at 3 years and to walk at 5. The past pathological history was unremarkable apart from frequent falling to the ground without loss of consciousness, and a fracture of the right femur a year ago. At age 18 she began to have swollen tendons.

General physical examination showed: oligophrenic face, poorly developed secondary sex characteristics, low stature, winged shoulders and slight scoliosis; multiple tendon swellings at both ankles, with deformed soles of the feet, at both knees (Fig. 2), at the styloid process of the right radius and at the proximal phalanx of the third finger of the right hand (Fig. 3); high-arched palate with hypertrophied left half and edentate right half of the upper dental arch (Fig. 4); bilateral inguinal lymphadenopathy.

The neurological findings were: standing so unsteady as to be possible only with support; supported gait ataxic with tendency to fall forwards; diffuse tendon hyperreflexia with extended right hallux; motor coordination of the upper limbs uncertain and of the lower limbs impossible; sensoric function could not be assessed owing to the patient’s poor cooperation and unreliability; disorientation to time; speech deficient both syntactically and semantically with nasal tone of voice but no disorders of comprehension.

Instrumental findings

Blood chemistry: normal apart from the cholesterol level (221 mg/dl vs NV 120-200) and platelet count (417 000/mm³).

Serological tests for syphilis negative.

Karyogram: no chromosomal aberrations.

ECG: within normal limits.

EEG: abundance of slow wave abnormalities.
Fig. 1. Size of the tendinous xanthomas in 1975.

Fig. 2-3. Development of the tendinous xanthomas in 1990.

Fig. 4. High-arched palate, hypertrophied left half and edentate right half of upper dental arch.

Radiography: chest normal; skull: accentuation of the spongy bone matrix in the frontoparietal regions bilaterally with blurred-edged microlacunarae; knees: periosteal irregularities at the tuberosity of the right tibia. Minute vascular calcifications of the left hamstring; feet: hammer-toes.

Large ovoid opacities above the heels behind the tibia; hands: metaphysis of the right radius showed wear-and-tear of the cortex with multiple scratches, partial blurring and slightly sclerotic margins. Swelling of the soft tissues of the proximal phalanx of the third finger of the left hand.

CT brainscan: signs of atrophy of the cerebellar hemispheres and of cerebral, mainly cortical, atrophy in the frontal region. Calcification in the fourth ventricle. MRI scan of the brain and high cervical segments: areas of altered signal above the tentorium in the white substance of both cerebral hemispheres together with gliosis of the periventricular white substance. Reduced thickness of the corpus callosum. Atrophy mainly cortical (Fig. 5). In the posterior cranial fossa there was atrophy of the cerebellar hemispheres and two symmetrical areas of altered signal in the white