

Picture of the month

Gluteus maximus hypertrophy: A diagnostic clue in four and a half LIM domain 1-mutated reducing body myopathy

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A 28-year old male was examined due to progressive proximodistal muscle weakness of three years' duration. Severe generalized skeletal muscle weakness and atrophy spared only the facial and distal hand muscles. The patient had marked neck rigidity and scapular winging. Echocardiography was normal. Over the following three years, weakness progressed rapidly and the patient became wheelchair-bound. Muscle MRI at age 29 showed severe fatty degeneration of the thigh and lower leg muscles predominantly involving the posterior compartments, whereas gluteus maximus muscles were markedly hypertrophic (Fig. 1A). A muscle biopsy (vastus lateralis) showed severe dystrophic changes and large cytoplasmic bodies reacting strongly with menadione-NBT (Fig. 1B). On electron microscopy these reducing bodies were composed of granulofilamentous material (Fig. 1C). *FHL1* gene sequencing revealed a previously unreported hemizygous mutation c.301T>C causing an amino acid change C100R in the second LIM domain of FHL1 protein.

The spectrum of X-dominant *FHL1*-opathies can be broadly divided into two categories: (1) Reducing body myopathies (RBM) with *FHL1* mutations affecting all three FHL1 isoforms, usually missense mutations, and (2) Emery–Dreifuss-like muscular dystrophies without reducing bodies on muscle biopsy, usually caused by truncating loss-of-protein mutations affecting

one or two FHL1 isoforms [1]. Predominantly scapulo-peroneal weakness, axial rigidity and selective muscle hypertrophy or pseudoathleticism are commonly observed in both types [1–3].

Recently, a distinctive MRI pattern including preserved or hypertrophic gluteus maximus muscles was described in FHL1-linked RBM based on three families with *FHL1* mutations C153R, C153Y and C150S [2,3]. We observed similar muscle involvement with striking gluteus maximus hypertrophy in our patient with a novel FHL1 mutation (C100R) and reducing body muscle pathology. This peculiar MRI finding may be a useful clinical clue to suggest an FHL1-related RBM disease. Although not routinely reported, the inclusion of pelvic muscles may add to the usefulness of MRI pattern recognition.

References

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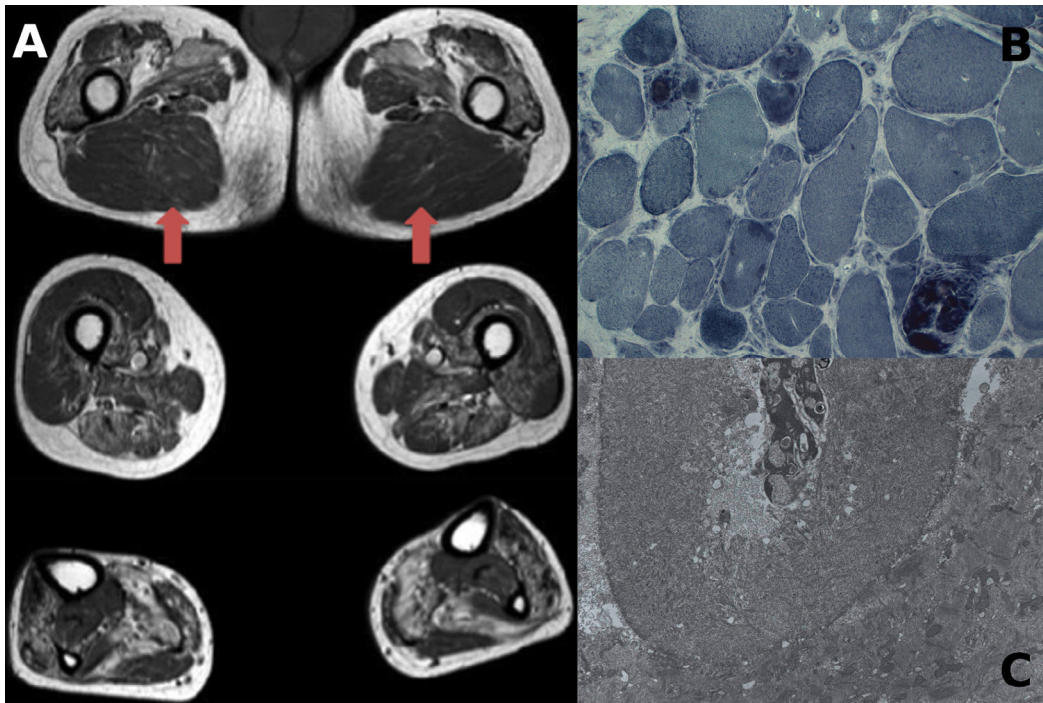


Fig. 1. (A) Lower limb muscle MRI at age 29. Striking gluteus maximus hypertrophy (arrows), fatty replacement mostly involving adductor and hamstring muscles. Soleus, medial gastrocnemius and peroneal muscles are also severely affected. (B) Muscle fibers contain darkly staining reducing bodies (menadione-NBT without substrate). (C) Electron micrograph shows a large reducing body composed of granulofilamentous material. An apoptotic nucleus is seen in the center of the body.