Isolated bilateral absence of abductor pollicis brevis and opponens pollicis muscles: A case report

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ABSTRACT

We report a rare case of a 21-year-old man with a bilateral absence of abductor pollicis brevis and opponens pollicis muscles, which has not been previously reported. He presented with weakness in both of his hands. On physical examination there was atrophy on the thenar eminences of both of his hands and there was an absence of gross functional impairment in his hand functions. On magnetic resonance imaging, abductor pollicis brevis and opponens pollicis muscles were bilaterally absent.

Key words: Abductor pollicis brevis, opponens pollicis, agenesis, absence

Introduction

Thenar atrophy, which is often observed in median nerve disorders, such as carpal tunnel syndrome, can also be seen in congenital syndromes or as an isolated congenital defect [1,2]. Although congenital absence of the abductor pollicis brevis (APB), flexor pollicis brevis (FPB), and opponens pollicis has been reported previously [2-6], bilateral congenital absence of the APB and opponens pollicis has yet to be reported.

Case Report

A 21-year-old man was referred to our clinic because of a flattening of both of his thenar eminences. Examination of his hands revealed bilateral atrophy of the thenar eminences (Figure 1). No sensory impairment was present in the median and ulnar nerve distributions of both hands. Both hand functions were normal, and passive and active ranges of motions of his wrist and other fingers were within normal limits. Only mild impairment of abduction and opposition was noted. The remaining physical examination was normal.

The grip strength of the patient and plain X-rays of both hands were normal. Electromyography (EMG), which included motor and sensory conduction studies and a needle EMG, revealed that the supra-maximal compound muscle action potential (CMAP) was very low in the APBs, and there was no gain in potential bilaterally during the needle EMG. There was no entrapment neuropathy or polyneuropathy. On magnetic resonance imaging, APB and opponens pollicis muscles were bilaterally absent (Figure 2). There was minimal

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Received / Accepted: May 27, 2015 / June 08, 2015

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Discussion

Abductor pollicis brevis, flexor pollicis brevis, opponens pollicis, and adductor pollicis are the intrinsic muscles of the thumb. Three of these four muscles (abductor pollicis brevis, opponens pollicis, and flexor pollicis brevis) form the thenar eminence [7], which flattens if one or more of these muscles are lacking or in atrophy. Thenar atrophies, or thumb hypoplasias, are rare conditions and are often observed with median nerve disorders, such as carpal tunnel syndrome. In addition, thenar atrophies or thumb hypoplasias sometimes occur as congenital syndromes or as an isolated congenital defect [1,2,4,5]. These syndromes include Fanconi syndrome (pancytopenic anemia), TAR (thrombocytopenia and absent radius), VACTERL (vertebra, anal, cardiovascular, tracheo-esophageal, renal and limb defects), Holt-Oram (congenital heart defects), Cornelia de Lange syndrome (dwarfism), Okihiro syndrome (Duane anomaly of the eyes and deafness), and Cavanagh’s syndrome (hypodevelopment of the thumb phalanges and adjacent carpal bones) [2-5,8]. We examined our patient systematrical-
ly and had necessary consultations from other clinics and observed no anomaly other than bilateral thenar atrophy.

We searched the Pubmed database and google academic, but found no previous report of an isolated bilateral abductor pollicis brevis and opponens pollicis agenesis. Hong et al. reported a case with an anomalous course of extensor pollicis longus muscle, with absence of abductor pollicis brevis, opponens pollicis, abductor pollicis longus, and extensor pollicis brevis muscles. However, as a unilateral case, our patient differs from this finding [3].

The patient that we present here had mild dysfunction in opposition and abduction, but no complaints nor limitations of activities of daily living. Opposition is accomplished with the combined motions of flexion, pronation, and palmar abduction of the thumb metacarpal [7]. The flexor pollicis brevis muscle primarily flexes the thumb metacarpophalangeal joint. Flexion is the action of moving the thumb in an ulnar direction within the plane of the palm. Additional actions of the FPB muscle include extension of the distal phalanx and pronation of the thumb metacarpal [9]. As a result, only the FPB muscle can achieve sufficient opposition for performing daily living tasks, as in our patient. Therefore, no surgery was considered for this patient, which would only have achieved cosmetic improvements. Muscle agenesis should be considered in thenar atrophies, especially in bilateral cases. In addition, these patients should be evaluated systematically, since thumb hypoplasias can arise from various syndromes.

**Conflict of interest statement**
The authors have no conflicts of interest to declare.

**References**