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CASE REPORT

Isolated musculocutaneous nerve palsy after heavy physical activity

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Case report

A 28-year-old previously healthy man was referred to the Orthopaedic Department of our Hospital for rupture of the right biceps tendon. Four days earlier, he had noticed inability to “make a muscle” by flexing his elbow following a day of heavy manual work with a shovel. He complained of no pain but reported some numbness along the lateral border of the right forearm.

On clinical examination, there was significant loss of the bulk of the biceps brachii muscle (Fig. 1) with absent tone and no visible or palpable contraction of the biceps and brachialis muscles. There was also weakness of right forearm flexion (grade 4/5) and supination (4/5). The right biceps reflex was absent. Sensory examination revealed a narrow zone of reduced light touch, pin and temperature appreciation in the lateral aspect of the right arm. The remainder of the physical examination was normal including volitional contraction of the coracobrachialis muscle upon palpation.

Ultrasound examination of the cubital fossa was suggestive of partial rupture of the biceps tendon. However, nerve conduction (Fig. 2) and EMG studies suggested axonal degeneration of the musculocuta-

neous nerve with normal motor unit morphology of the biceps and brachialis muscles. Complete rest was recommended.

At a follow-up examination 1 month later, the power and the bulk of the muscles had improved, but there was still significant muscle atrophy. The numbness had almost disappeared. At the 5-month follow-up examination, the muscle mass and the power of forearm flexion and supination had recovered completely (Fig. 3). Electrophysiological studies of the musculocutaneous nerve were normal.

Discussion

The musculocutaneous nerve originates from the lateral cord of the brachial plexus (C_{5–7}) and runs obliquely down between the axillary artery and the median nerve medially and the coracobrachialis muscle laterally, which the nerve supplies before and while piercing it.³ The nerve then descends between the biceps and the brachialis muscles, which it innervates, and terminates as the lateral cutaneous nerve of the forearm.

Injuries to the musculocutaneous nerve are usually associated with lesion of other nerves of the brachial plexus. Isolated non-traumatic musculocutaneous nerve palsy is very rare and has been related to weight lifting,^{1,9} repetitive carrying of a heavy rolled object,⁷ strenuous physical activity,^{1,5,8} football

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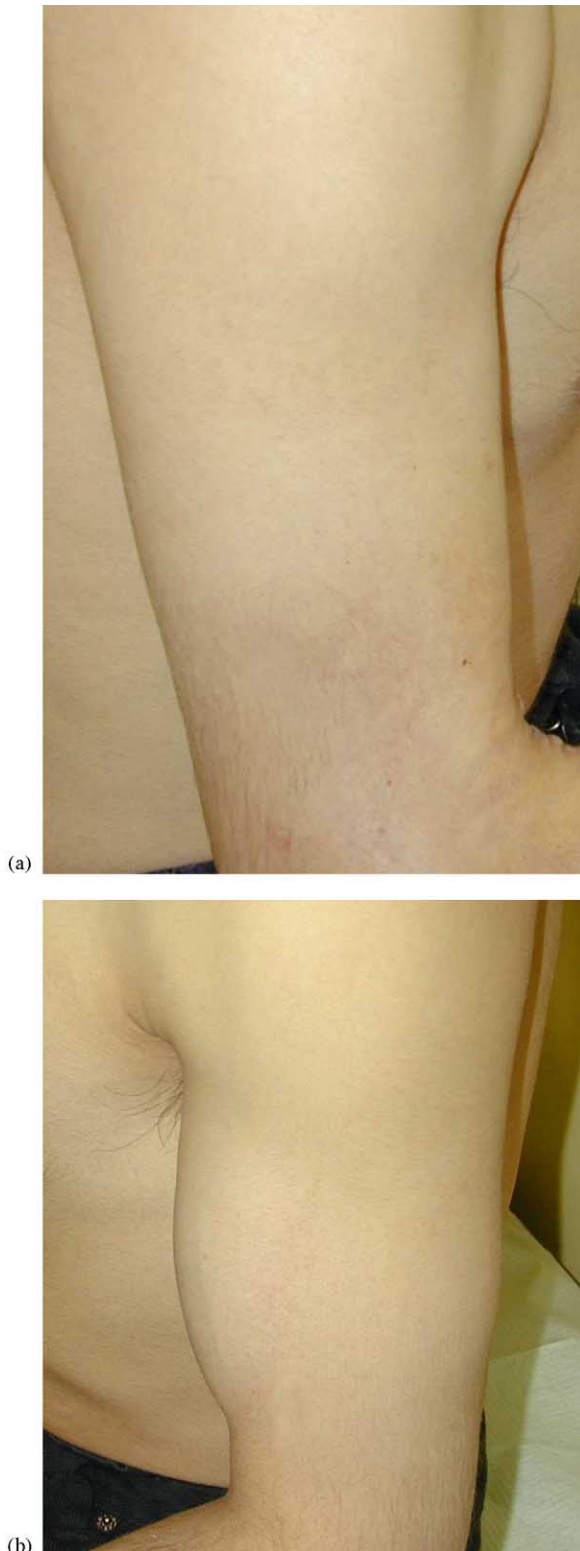


Figure 1 Loss of the bulk of the right biceps at the initial examination: (a) right arm; (b) left arm.

throwing,⁴ rowing,⁵ surgery,² pressure during sleep or may be idiopathic.⁶ In most cases, including ours, sparing of the coracobrachialis muscle indicates that the musculocutaneous nerve lesion is located in the

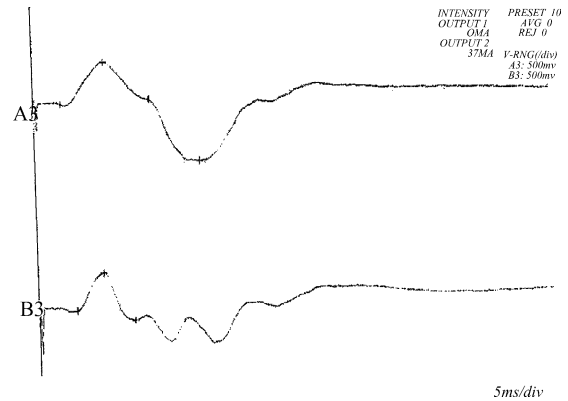


Figure 2 Motor nerve conduction study of the musculocutaneous nerve. The potential on the right side (lower graph) is low and indicates axonal degeneration.

segment between the takeoffs of the branches to the coracobrachialis and the biceps. The most likely mechanism is entrapment of the nerve within the coracobrachialis muscle. Hypertrophy or strong contraction of the coracobrachialis is assumed to cause direct mechanical and ischaemic injury to the nerve with subsequent focal demyelination and variable axonal degeneration.^{7,8} However, lesion proximal to the coracobrachialis has also been described.⁴

Differential diagnosis includes cervical radiculopathy (particularly C₅ or C₆) or upper trunk or lateral cord lesion of the brachial plexus.⁴ In our case, as in Simonetti's,⁸ the initial diagnosis was that of a ruptured biceps tendon. The findings of the ultrasound scan were confusing; they suggested partial biceps tendon rupture. However, the clinical signs were not in agreement with these findings: the absence of feeling any pain or hearing any snapping noises, the occurrence of definite clinical symptoms after finishing the manual work and the sensory disturbances of the forearm supported a nerve lesion. This was confirmed by electrophysiological studies.

In conclusion, the diagnosis of isolated musculocutaneous nerve palsy should be borne in mind in patients with sudden loss of forearm flexion strength and bulk of the biceps muscle after heavy manual work. The findings of the ultrasound scan may be misleading. Careful clinical examination and electrophysiological studies will set the diagnosis.

Conflict of interest statement

All authors have no financial or personal relationship with other people or organizations that could inappropriately influence their work.



Figure 3 Recovery of the biceps after 5 months.

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