

Superficial radial neuropathy and brachioradial motor nerve palsy associated with proximal radius osteochondroma

Uszkodzenie gałęzi powierzchownej nerwu promieniowego i gałęzi unerwiającej mięsień ramiennie-promieniowy związane z kostniakochrzęstniakiem części bliższej kości promieniowej

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Abstract

The cutaneous branch of the radial nerve (superficial radial nerve, SRN) might be compressed or injured at various anatomical sites along its course in the forearm. Compression of the SRN occurring at the proximal third of the forearm is unusual.

A 22-year-old man was admitted with pain and paraesthesia over the lateral aspect of his right wrist and thumb and pain at the elbow for six months. In electrodiagnostic testing, a sensory nerve action potential from the right SRN could not be recorded, while it was normal on the left. In a needle electromyography study, denervation potentials have been seen in the right brachioradial muscle and a decrease in interference pattern signals was also found. An exophytic lesion of the proximal radius was observed in radiographs. Computed tomography evaluation revealed an osteochondroma of the proximal radius.

Neuropathies of the SRN and the brachioradial motor branch of the radial nerve are thought to be associated with proximal radial osteochondroma.

Key words: superficial radial neuropathy, brachioradial motor neuropathy, proximal radial osteochondroma, electromyography.

Streszczenie

Gałąź skórna nerwu promieniowego, nerw promieniowy powierzchowny, może zostać uciśnięta lub uszkodzona w różnych lokalizacjach anatomicznych na swoim przebiegu w przedramieniu. Ucisk nerwu promieniowego powierzchownego występujący w jednej trzeciej bliższej przedramienia jest rzadkością.

Mężczyzna, lat 22, został przyjęty z powodu bólu i parestezji na bocznej powierzchni prawego nadgarstka i kciuka oraz bólu w okolicy łokcia, utrzymujących się od 6 miesięcy. W badaniu przewodnictwa nerwowego stwierdzono brak czuciowych potencjałów czynnościowych z prawego nerwu promieniowego powierzchownego; po stronie lewej potencjały takie były prawidłowe. W elektromiografii igłowej stwierdzono potencjały odnerwienia i zmniejszony zapis interferencyjny w prawym mięśniu ramiennie-promieniowym. Na zdjęciach przeglądowych stwierdzono egzofityczną zmianę w obrębie części bliższej kości promieniowej. Obraz tomografii komputerowej wskazywał na kostniakochrzęstniaka części bliższej kości promieniowej.

Uznano, że stwierdzone uszkodzenia nerwu promieniowego powierzchownego i gałęzi ruchowej nerwu promieniowego zaopatrującej mięsień ramiennie-promieniowy są związane z obecnością tego guza.

Słowa kluczowe: neuropatia nerwu promieniowego powierzchownego, neuropatia gałęzi ruchowej unerwiającej mięsień ramiennie-promieniowy, kostniakochrzęstniak części bliższej kości promieniowej, elektromiografia.

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Introduction

The radial nerve is the largest branch of the brachial plexus; its damage is prevalent among upper extremity mononeuropathies. There are a variety of sites at which the radial nerve is susceptible to trauma and entrapment. Localization of radial nerve lesions relies mainly on clinical knowledge of radial nerve anatomy as well as sensory and motor examination [1].

The cutaneous branch of the radial nerve (superficial radial nerve, SRN) might be compressed or injured at various anatomical sites along its course in the forearm. Many different aetiological factors for chronic nerve entrapment have been demonstrated (trauma, diabetes, stretching, tight wristlet, exposure to severe cold, dorsal wrist ganglion) at the distal third of the forearm. Trauma such as fall, scaphoid fracture, fracture of the head of the radius, and bone spike are the most common responsible factors [2-4]. Compression of the SRN occurring at the proximal third of the forearm is unusual. Tzeng *et al.* presented a case of SRN compression due to a parosteal lipoma of the proximal radius [5].

We present a case of superficial radial neuropathy and neuropathy of the motor branch of the radial nerve that innervates the brachioradial muscle due to an osteochondroma of the proximal radius.

Case report

A 22-year-old man was admitted to our neurology department. His complaints were pain and paraesthesia over the lateral aspect of his right wrist and thumb as well as pain at the elbow for six months. By the hyperpronation of the forearm a positive Tinel's sign was evoked at the dorsoradial aspect of the wrist.

An electrodiagnostic test revealed normal values of compound muscle action potential (CMAP) responses from the extensor indicis proprius and extensor carpi ulnaris bilaterally. A sensory nerve action potential (SNAP) from the right SRN could not be recorded; it was normal on the left side. Right median and lateral cutaneous nerve SNAPs were normal. In needle EMG study, denervation potentials were seen in the right brachioradial muscle and a decrease in interference pattern signals was also found. The electrodiagnostic test revealed severe axonal degeneration in the motor branch of the radial nerve that innervates the brachioradial muscle, and in the SRN that passes below that muscle.

After electrodiagnostic testing, radiographs of the right upper extremity were obtained. We noted an exophytic lesion in the proximal radius (Fig. 1). Computed tomography evaluation revealed an osteochondroma in that location (Fig. 2).

The neuropathy of the SRN and concurrent neuropathy of the motor branch of the radial nerve that innervates the brachioradial muscle are thought to be associated with proximal radial osteochondroma.

Because of this space occupying lesion, the patient was offered surgical treatment but he did not accept it. Therefore, only analgesic medication (diclofenac sodium, 75 mg daily) was introduced.



Fig. 1. Exophytic lesion in right proximal radius

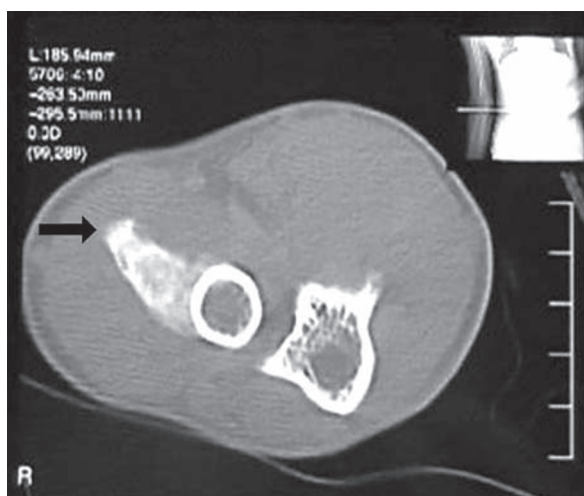


Fig. 2. Proximal radial osteochondroma in computed tomography

Discussion

The radial nerve is primarily responsible for motor innervation of the upper extremity extensors, as well as receiving cutaneous innervation from most of the posterior arm, forearm, and hand. It may be injured at the axilla or upper third of the arm, the spiral groove of the humerus and the elbow. In the upper third of the forearm, the radial nerve divides into two branches and mononeuropathies of the posterior interosseous and superficial sensory radial nerves can be distinguished. Compression of the SRN occurring at the proximal third of the forearm is unusual.

Electrodiagnostic tests are important. Recognition of EMG abnormalities confined to radial-innervated muscles is considered essential for identifying the site of injury to the radial nerve and for differential diagnosis with respect to C7 radiculopathy and plexopathy.

In our case we defined SNAP pathology of the SRN. Then, further tests and needle EMG were performed. We investigated the pathology of the motor branch of the nerve that innervates the brachioradial muscle. Then we focused on a local lesion and ordered radiographs and computed tomography. A space occupying lesion of the proximal radius was demonstrated.

Clinicians should consider the presence of a space occupying lesion of the proximal radius in case of superficial radial neuropathy; the electrodiagnostic tests must be complete.

Disclosure

Authors report no conflict of interest.

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