

Richie Cannieu Anastomosis: A Case Report

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Abstract

To perform or interpret an electrodiagnostic study, one should have a thorough knowledge about the normal human anatomy. Along with that, one should keep in mind the possibility of various anastomoses which can occur between different nerves. Richie Cannieu anastomosis is an anomalous ulnar to median communication in the palm between the deep branch of the ulnar nerve and the recurrent branch of the median nerve. Such an anastomosis in a setting of median or ulnar nerve injury can produce confusing clinical and electrodiagnostic findings. Correct diagnosis is important especially before planning any surgical intervention. Here we report a case of Richie Cannieu anastomosis to highlight the importance of knowing about such anastomoses.

Key words: Richie Cannieu anastomosis, electrodiagnosis.

Introduction:

Richie Cannieu anastomosis is an anomalous ulnar to median communication in the palm between the deep branch of the ulnar nerve and the recurrent branch of the median nerve. This anastomosis was first described by Richie (1897) and Cannieu (1897).

There are three types described:

1. All hand muscles innervated by the ulnar nerve (all-ulnar hand)
2. Motor innervation dominantly by the ulnar nerve
3. Some median innervated muscles innervated by the ulnar nerve.

Case Report:

A 43 years old male manual labourer with acute onset of right- sided foot drop was referred to our department for

electrodiagnostic studies. We did a clinical evaluation initially which revealed a right sided foot drop and sensory impairment in the right L4, L5 dermatomes. No other positive findings were found. Deep tendon reflexes were normally present in all the four limbs, the plantar reflexes were flexor bilaterally, the other limb was normal. No sensory or motor deficits were observed in the upper limbs. The routine investigations were within normal limits.

The patient was posted for an electrodiagnostic study for evaluation of foot drop. The nerve conduction studies (NCS) and needle electromyography (EMG) was performed using standard techniques under ideal conditions. During this procedure, we did the usual screening of the upper limbs. We encountered some interesting findings which prompted further electrodiagnostic evaluation. While stimulating the median nerve at the wrist and recording from the abductor pollicis brevis (APB), we got a low amplitude bifid compound muscle action potential (CMAP) (Figs 1&2). On stimulation of the median nerve at the elbow, a similar small amplitude bifid CMAP was obtained. Hence a Martin Gruber anastomosis was ruled out. Since the patient had normal strength of the APB and no wasting, we stimulated the ulnar nerve and recorded from the APB which surprisingly showed a CMAP just like that usually obtained when the median nerve is stimulated and recording is done from the APB. On stimulating the ulnar nerve and recording from the abductor digiti minimi (ADM), we obtained a CMAP of normal amplitude and latency. On stimulating the median nerve and recording

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from the ADM, no wave forms were obtained. These findings were obtained bilaterally. Needle EMGs of bilateral APB (Fig 3) and ADM (Fig 4) were normal. The sensory nerve action potentials (SNAP) from median, ulnar and radial nerves of both upper limbs were normal. These findings point to a rare anastomosis of ulnar to median nerves in both hands namely Richie Cannieu anastomosis. NCS of the lower limbs showed normal sural sensory conduction and reduced amplitude of CMAP recorded from the extensor digitorum brevis

and the adductor hallucis which pointed to a pre-ganglionic lesion. An MRI showed L4/L5 disc prolapse.

Discussion:

Studies show varying data regarding the incidence of Richie Cannieu anastomosis. Budak *et al*¹ did not find any in 216 hands while Sarikcioglu and Sindel² found it in 1 out of 32 hands, Cannieu³ in 3 out of 20 hands, Harness and Sekeles⁴ in 27 out of 35 hands (77%) and Homma and Sakai⁵ in 4 out of 6 hands (66.6%).

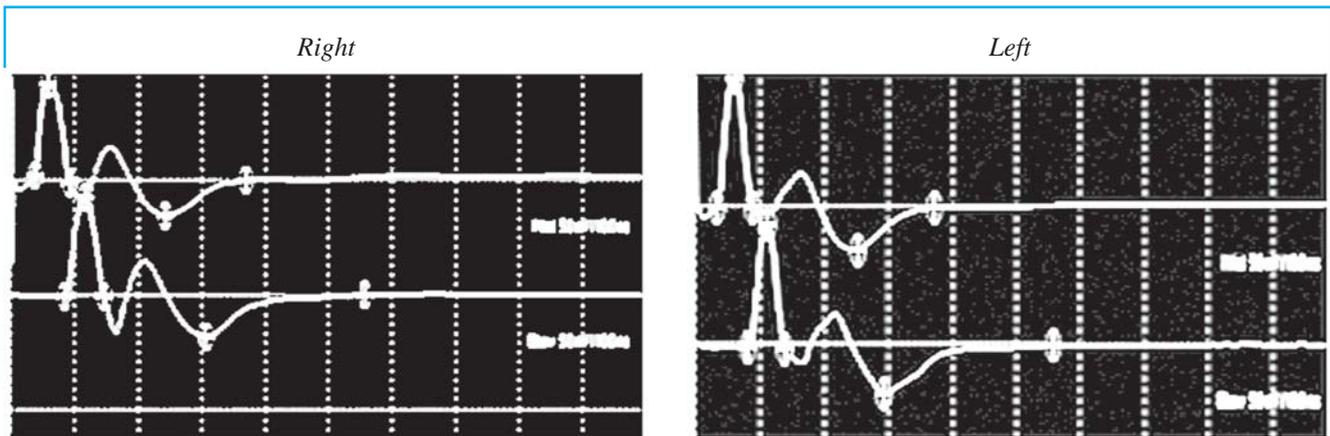


Fig 1- Median CMAP

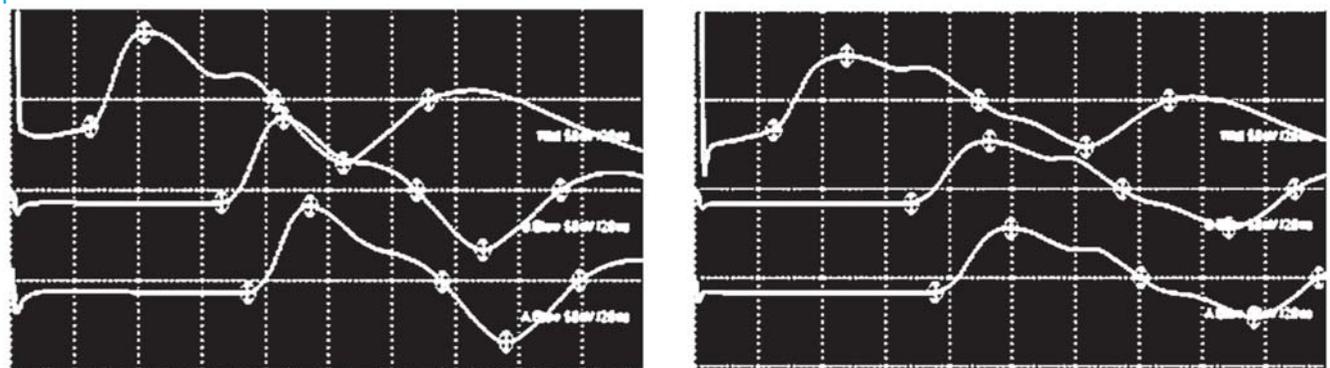


Fig 2- Ulnar CMAP

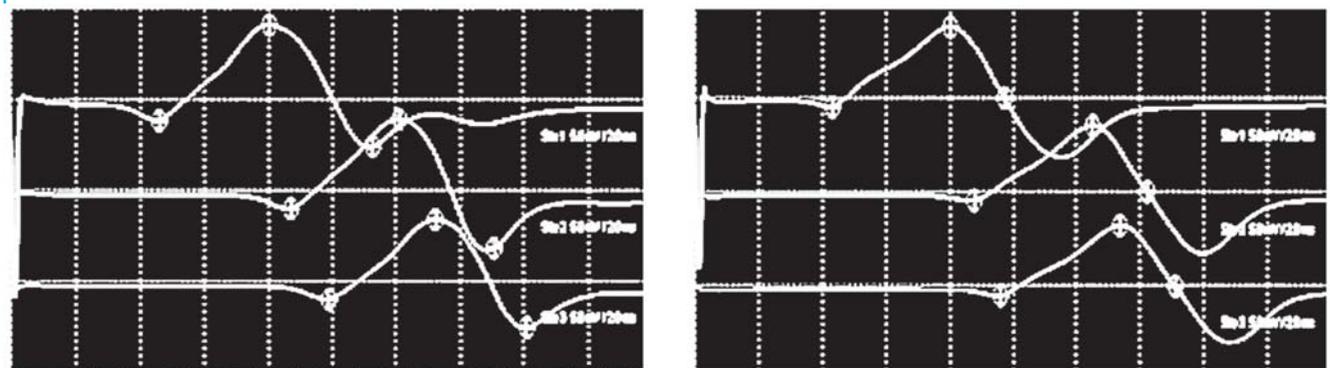


Fig 3- Ulnar Nerve Stimulation and Recording from APB

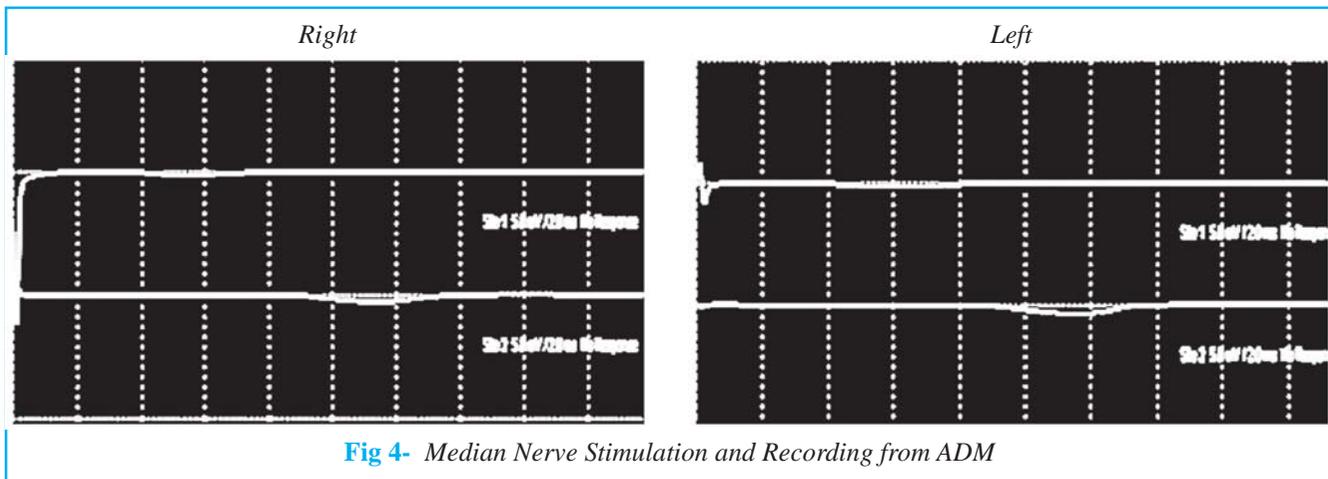


Fig 4- Median Nerve Stimulation and Recording from ADM

The knowledge about Richie Cannieu anastomosis is very important while doing an electrodiagnostic study. Otherwise there is a high chance for misdiagnoses. There is a case report by Saperstein and King⁶ about coexistence of a deep branch ulnar neuropathy and Richie Cannieu anastomosis wrongly diagnosed as motor neuron disease. Tamagawa *et al*⁷ reported a case of bilateral carpal tunnel syndrome in which there was a paradoxical preservation of the left abductor pollicis brevis muscle which was proven to be due to Richie Cannieu anastomosis. Refaian *et al*⁸ reported 2 cases of bilateral carpal tunnel syndrome in which the patients had significant preservation of function and minimal thenar muscle atrophy despite complete absence of a median CMAP. Sahcs *et al*⁹ reported two cases with nearly exclusive ulnar innervation of thenar muscles because of the presence of palmar communication between the ulnar and median nerve. Dumitru *et al*¹⁰ reported a case of ulnar neuropathy at the elbow with partial paralysis of the Abductor Pollicis Brevis. It is mentioned by Kline *et al*¹¹ about the erroneous diagnosis regarding the median nerve function after injury at the wrist which is presumably occurring in approximately one-third of cases. Boland *et al*¹² suggested an autosomal dominant inheritance for this anastomosis. Such an anastomosis in a setting of median or ulnar nerve injury can produce confusing clinical and electrodiagnostic findings. Correct diagnosis is thus important especially before planning any surgical intervention.

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