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Case Report

The strain – Counter strain technique in the management of anterior interosseous nerve syndrome: A case report



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المخلص

متلازمة العصب بين العظمي الأمامي؛ هي الاعتلال العصبي للعصب المتوسط القريب على مستوى الساعد. يمكن أن تحدث نقاط الزناد في المقصورات الأمامية للساعد ضغطاً للعصب بين العظمي الأمامي، وهذا بدوره يسبب ضعف العضلات. يعرض التقرير حالة سيدة عمرها ٣٧ عاماً، اشتكت من شعور غير طبيعي عند مسك القلم أثناء الكتابة. وأظهر الفحص السريري (الملاحظة، والملمسة، وقوة القبضة) ضعفاً في قوة القبضة، ونقاط الزناد النشطة في منتصف الجانب الأمامي من الساعد وإيجابية علامة الدائرة. بدأ علاجها بالتدليك بالتبريد، والتحرك العصبي، والتحفيز العصبي الكهربائي عبر الجلد، وتقنية الضغط الإجهادي المعاكس أربع مرات أسبوعياً لأسبوعين. وجدت المريضة تحسناً في قوة القبضة، تم قياسه بمقياس القبضة الهيدروليكي الأساسي، كما وجدت تحسناً في نقاط الزناد غير النشطة باللمس، وتحسن خط اليد. يكشف تقرير هذه الحالة فاعلية تقنية الضغط الإجهادي المعاكس في الاعتلال العصبي الانحباسي كإضافة هامة للعلاج التحفظي. كما أظهرت تقنية الضغط الإجهادي المعاكس تحسناً في قوة العضلات.

الكلمات المفتاحية: تقنية الإفراج الموضعية؛ الانزلاقات العصبية؛ متلازمة العصب المتوسط؛ الاعتلال العصبي الانحباسي؛ العلاج الطبيعي؛ الاعتلال العظمي

Abstract

Anterior interosseous nerve syndrome (AINS) is a proximal median nerve neuropathy affecting the forearm.

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Trigger points in the anterior compartment of the forearm may cause compression of the anterior interosseous nerve (AIN) which, in turn, may result in muscle weakness. Here we present the case of a 37-year-old female who complained of an abnormal pen grip while writing. Clinical examination (observation, palpation, pincer grip strength) showed weak pincer grip strength, an active trigger point in the middle of the anterior forearm and a positive circle sign. Her treatment course included cryomassage, neural mobilization, transcutaneous electrical nerve stimulation (TENS) and the strain-counter strain (SCS) technique four times a week for two weeks. On follow-up, the patient reported an inactive trigger point on palpation, improvement in her handwriting and improved pincer (fingertip pinch) grip strength in pounds (lbs) as recorded by the Baseline Hydraulic Pinch Gauge. This case report explored the effectiveness of SCS as an important adjunct to other conservative treatments for entrapment neuropathies. SCS has also shown its potential to improve muscle strength.

Keywords: Entrapment neuropathy; Median nerve syndrome; Nerve sliders; Osteopathy; Physiotherapy; Positional release technique

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Introduction

Anterior interosseous nerve syndrome (AINS) is also known as Kiloh – Nevin Syndrome. The aetiology of AIN syndrome is poorly understood. However, two commonly known causes are entrapment/compression neuropathy and brachial plexus neuritis.¹ AIN is a rare entrapment syndrome that accounts for less than 1% of upper extremity neuropathies.² AIN is a pure motor nerve that supplies the deep muscles of the anterior compartment of the forearm, namely, the flexor pollicis longus (FPL), the radial side of the flexor digitorum profundus (FDP) and the pronator quadratus (PQ). AIN arises from the median nerve 5–8 cm below the level of the lateral epicondyle,³ as shown in Figure 1. AIN receives contributions from the C5-T1 levels and lies along the radial side of the forearm.⁴ It has a course roughly parallel to the median nerve between the superficial and deep heads of the pronator teres and lies directly underneath the arcade of the flexor digitorum superficialis on the anterior interosseous membrane, ending in the wrist capsule.⁵ Patients with AIN syndrome present with motor disturbances and functional deficits of the affected muscles.⁶ These patients typically exhibit a characteristic inability to form a full circle or an ‘O’ shape with their index finger and thumb.⁷ AINS is difficult to diagnose because of the multiple anatomical compressions and pathologies involved in the proximal median nerve neuropathies. Therefore, appropriate treatment strategies are difficult to implement. This case report explores the treatment of AIN compression syndrome with the release of muscular compression using strain-counter strain (SCS) and other physical and manual therapeutic techniques.

Case report

A 37-year-old female presented with a one-month history of improper pen grip and difficulty writing. There was no history of precipitating trauma affecting her arm. She had no

shoulder or neck pain. She is a dentist by occupation, but denied any occupational repetitive stress injury to her hand. She was otherwise healthy with no significant medical or surgical history.

On physical examination, unequivocal abnormal and weak pen grip were found (Figure 2). The patient was able to form only a weak circle or “OK” sign (Figure 3) due to weakness of the flexor pollicis longus and flexor digitorum profundus muscles. Because of this obvious clinical deficit and considering both the economic status of the patient and the non-availability of electrophysiological testing at the treatment centre, the patient was not referred for electrophysiological diagnostic testing. The median nerve had no noticeable changes in nerve conduction velocity (NCV) due to the transient inflammation of AINS, hence, NCV testing was not performed. No sensory abnormalities were noted. Unfortunately, we did not document the important changes in FPL, FDP and PQ muscle function before and after treatment that could have been detected by EMG. Pincer grip strength was measured using a hydraulic pinch gauge (BASELINE® 50 lb Hydraulic Pinch Gauge, Model No: 12-0235; Fabrication Enterprises Inc., White Plains, NY 10602, USA). This pinch gauge has a highly reliable Intra-class Correlation Coefficient (ICC = 0.89 – 0.93) and high Pearson’s coefficient validity ($r = 0.89 - 0.95$) with an isokinetic dynamometer.⁸ The tip pinch strength of the patient was five pounds (5 lbs), as compared to the dominant hand standard reference norms of 8–19 lbs for women in the 35–39 year age group,⁹ thus representing a significant reduction (Figure 4).

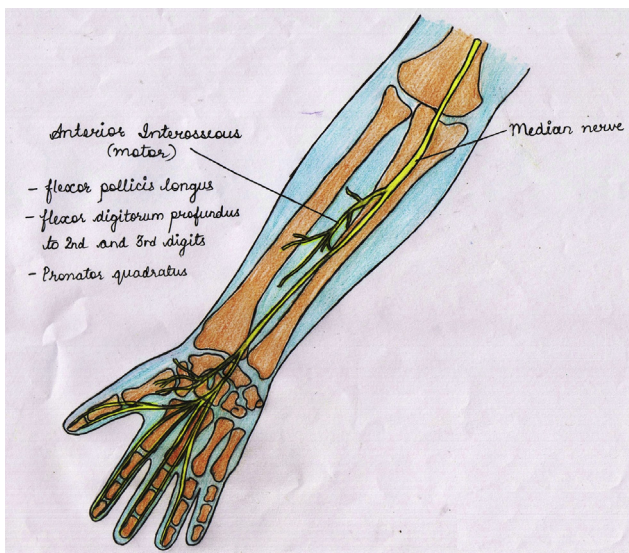


Figure 1: Origin and course of anterior interosseous nerve (AIN) in the anterior aspect of the forearm.

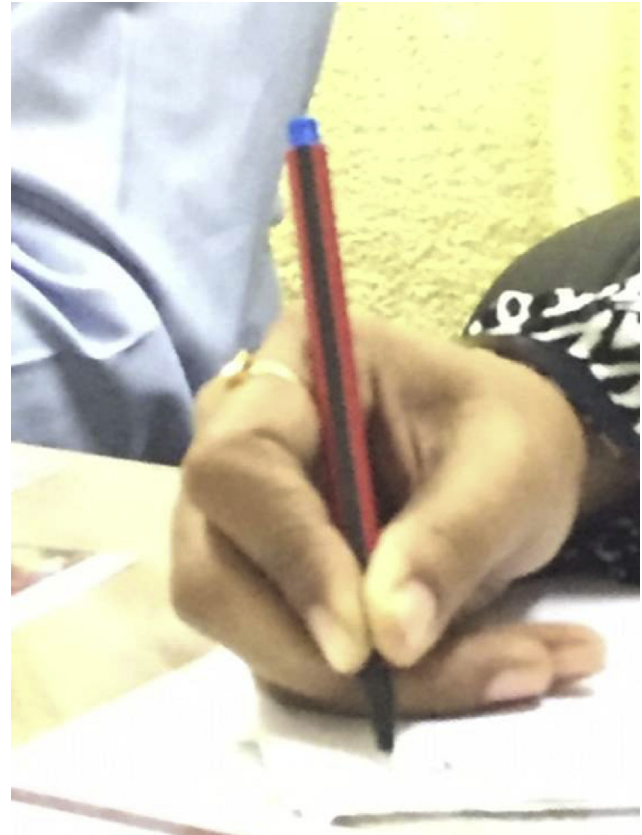


Figure 2: Abnormal pen grip.

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