

Minimally Invasive Endoscopic Decompression for Anterior Interosseous Nerve Syndrome: Technical Notes

Hans-Georg Damert, MD, Reimer Hoffmann, MD, Armin Kraus, MD,
R. Lee Stowell, MD, John Lubahn, MD

Anterior interosseous nerve syndrome (Nevin–Kiloh syndrome) is a rare entity caused by compression of the purely motor anterior interosseous nerve in the forearm. Historically, conventional surgical treatment has consisted of open decompression of the nerve. Unfortunately, open decompression is often complicated by scarring and significant morbidity. Endoscopic decompression is an alternative means of surgical intervention in the hands of well-trained surgeons comfortable with soft tissue endoscopy. In this report, we review relevant anatomy, offer technical hints, and present our personal experience with 4 illustrative cases, all with greater than 1.5 years of follow-up. Our patients showed considerable improvement of their symptoms with minimal scarring. No significant complications occurred. (*J Hand Surg* 2013;38A:2016–2024. Copyright © 2013 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Anterior interosseous nerve syndrome, Kiloh–Nevin syndrome, peripheral nerve decompression, minimally invasive endoscopic decompression.



ANTERIOR INTEROSSEOUS NERVE syndrome (Nevin–Kiloh syndrome) is a rare entity caused by compression of the anterior interosseous nerve (AIN) in the forearm.^{1–11} Patients may show weakness of the flexor pollicis longus muscle (FPL), the flexor digitorum profundus muscle (FDP) of the index finger, and the pronator quadratus muscle. The FDP of the middle finger is affected in rare cases. Surgical decompression is indicated when

symptoms last for more than 3 months. Open decompression is considered by many to be the standard of care.³ This method causes a large and obvious scar that may become hypertrophic.¹² Formation of internal adhesions within the forearm is also common with the open technique. Minimally invasive techniques may help prevent scar and adhesion formation. Furthermore, periods of immobilization may be reduced and time away from work minimized. In our retrospective study, we review relevant surgical anatomy, describe the surgical technique, offer pearls and pitfalls, and detail postoperative management and complications.

From the Klinik für Plastische, Ästhetische und Handchirurgie, Uniklinikum Magdeburg, Magdeburg; and the Institut für Handchirurgie und Plastische Chirurgie Oldenburg (HPC Oldenburg), Oldenburg, Germany; and the Department of Orthopaedics, UPMC Hamot, Erie, PA.

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Corresponding author: John Lubahn, MD, Department of Orthopaedics, Hand, Microsurgery, and Reconstructive Orthopaedics, LLP, 300 State Street, Suite 205, Erie, PA 16507; e-mail: jdlubahn@jdlubahn.com.

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RELEVANT ANATOMY

The median nerve is composed of fibers from both the medial and lateral cords of the brachial plexus that contain branches of C6 to T1. The nerve enters the arm lateral to the brachial artery. At the level of the coracobrachialis insertion, the median nerve passes anterior to the brachial artery and then descends with the artery to the cubital fossa. Within the cubital fossa,

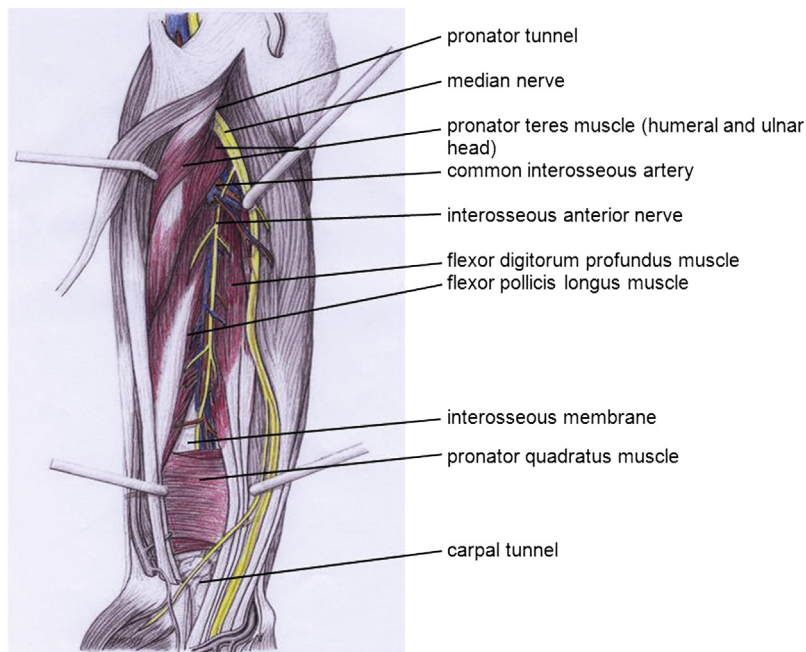


FIGURE 1: Proximal forearm neural anatomy including median and interosseous nerves.

the median nerve lies anterior to the biceps brachialis muscle, posterior to the bicipital aponeurosis, and remains medial to the brachial artery (Fig. 1). As the median nerve passes deep to the bicipital aponeurosis and enters the proximal forearm, it passes between the 2 heads of pronator teres, which it innervates. Motor branches are also given off to the flexor carpi radialis and palmaris longus muscles. An arch is formed by the ulnohumeral and radial fibers of the flexor digitorum sublimis (FDS), and just distal to this arch, the AIN branches from the median nerve proper. Its course follows the axis of the forearm between the FPL and the FDP muscles on the interosseous membrane until it reaches and innervates the pronator quadratus muscle. Traversing deep to the pronator quadratus, terminal branches of the AIN innervate the wrist and articular capsule.

INDICATIONS

Treatment with immobilization and nonsteroidal anti-inflammatory medications is generally regarded as appropriate initial conservative management. Outpatient therapy may be beneficial insofar as electrical stimulation of the motor end plates of the involved muscles may help preserve function; patients should be instructed to maintain passive motion of the interphalangeal (IP) joints of the thumb, index, and long fingers if it is involved. Surgical decompression should be considered in patients who have been refractory to conservative measures and symptomatic

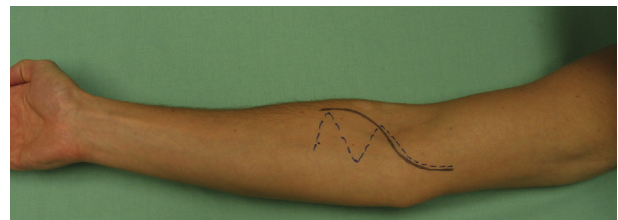


FIGURE 2: Incisions for the open method (12–15 cm).



FIGURE 3: Incision for endoscopic decompression.

for longer than 3 months. An electrophysiological exam before surgery is obligatory.

CONTRAINDICATIONS

Neurological pathologies such as neuritis (Parsonage–Turner syndrome) are present in approximately 20% of AIN syndrome cases. Symptomatic AIN

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