



Coexistence of Trifid and Bifid Median Nerve in a Patient with Bilateral Carpal Tunnel Syndrome

Bilateral Karpal Tünel Sendromu Hastasında Trifid ve Bifid Median Sinir Birlikteliği

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ABSTRACT

Carpal tunnel syndrome is the most common upper extremity neuropathy in the wrist that may be associated with anatomic variations of median nerve. Trifurcation of the median nerve has been very rarely reported in the literature. We report coexistence of bilateral median nerve variation in the wrist and its radiological features. Ultrasonography and magnetic resonance imaging was performed to the patient after Tinel and Phalen tests. There was bifurcation and trifurcation of the median nerve in right and left wrists respectively. Bilateral carpal tunnel syndrome was caused by bilateral median nerve variation in the present case. When a median nerve variation is detected in one wrist, a possible variation at the other side should be kept in mind and hence should be evaluated. A thorough knowledge of the variations of the median nerve is essential in order to avoid surgical complications and to ensure optimal patient outcome. US is an easy and cheap radiological method for diagnosis and it should be the first chosen radiological technique to evaluate median nerve variations in idiopathic CTS patients.

KEYWORDS: Trifid median nerve, Median nerve variation, Carpal tunnel syndrome

ÖZ

Karpal tünel sendromu (KTS) üst ekstremitenin en sık görülen tuzak nöropatisidir ve anatomik varyasyonlarla ilişkili olabilir. Median sinirin el bileği düzeyinde üçe ayrılması literatürde çok az yayınlanmıştır. Biz yazımızda, el bileği düzeyinde bilateral median sinir varyasyonunu radyolojik bulguları ile sunduk. Tinel ve Phalen testlerinden sonra hastaya ultrasonografi ve manyetik rezonans görüntüleme tetkikleri gerçekleştirildi. Sırasıyla median sinirde, sağ el bileğinde bifurkasyon, sol el bileğinde trifurkasyon tespit edildi. Median sinirde bir el bileğinde varyasyon tespit edildiği zaman diğer el bileğinde de olabileceği akılda tutulmalı ve diğer el bileği de değerlendirilmelidir. Median sinir varyasyonlarını bilmek olası cerrahi tedavi komplikasyonlarını etkileyebilmektedir. Ultrasonografi kolay ve ucuz bir radyolojik tanı metodudur ve idiopatik KTS hastalarında varyasyonları değerlendirmek için seçilebilecek ilk radyolojik modalitedir.

ANAHTAR SÖZCÜKLER: Trifid median sinir, Median sinir varyasyonları, Karpal tünel sendromu

INTRODUCTION

Carpal tunnel syndrome (CTS) is the most common upper extremity neuropathy caused by entrapment of the median nerve in the wrist (1). A high division of the median nerve proximal to the carpal tunnel, also known as bifid median nerve, is an anatomic variation that may be associated with CTS (3). The occurrence of a bifid median nerve has been reported in the literature, and in most cases it coexists with a persistent median artery (1, 5). Trifurcation of the median nerve has been very rarely reported in the literature. In a recent MRI study, only one patient had a trifid median nerve (4). It is possible to avoid from the advertent injury of the median nerve during carpal tunnel surgery by recognizing the anatomy and variations (2). To our knowledge, such variations of median nerve in both hands have not been reported before. We report coexistence of bilateral median nerve variation in the wrist and its radiologic features.

CASE PRESENTATION

A 46 year-old woman was admitted to outpatient clinic of physical therapy and rehabilitation with complaint of pins and needles in both hands for 2 years. Physical examination was normal other than positive Phalen and Tinel tests of both hands. Her past medical history was unremarkable. Laboratory tests including complete blood count, liver enzymes and kidney function tests were all within normal limits. Electromyographic evaluation (EMG) revealed the diagnosis of CTS in both hands. The result of EMG was mild and moderate CTS in the right and left wrists respectively. Ultrasonography (US) was performed using a high resolution real-time imaging unit (GE LOGIQ S6 system General Electronic Milwaukee, Wisconsin) with a 10-14 MHz linear probe. At US examination we noticed that the median nerve divided into two and three divisions in the right and left wrists respectively (Figure 1-3). Magnetic resonance imaging (MRI) using a 1.5-T

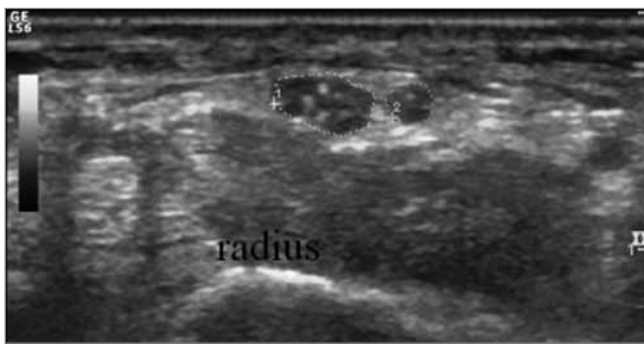


Figure 1: Axial ultrasound image of the circled median nerve in right wrist; two branches of the median nerve at the level of radiocarpal joint; the echogenic line indicates the head of the radius.

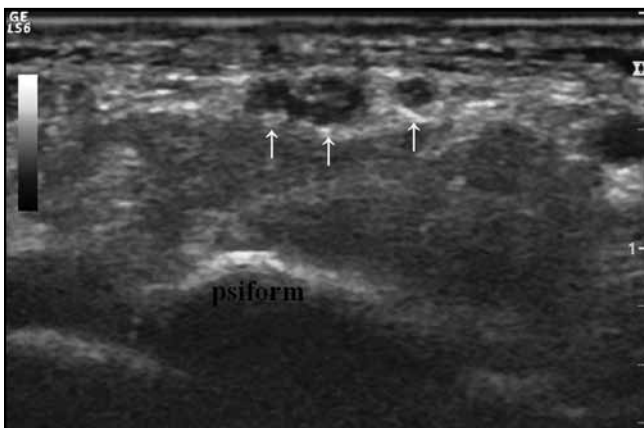


Figure 2: Axial ultrasound image of the median nerve in the left wrist; white arrows shows the three branches of the median nerve at the level of the scaphoid-pisiform bone; the echogenic line indicates the pisiform bone.

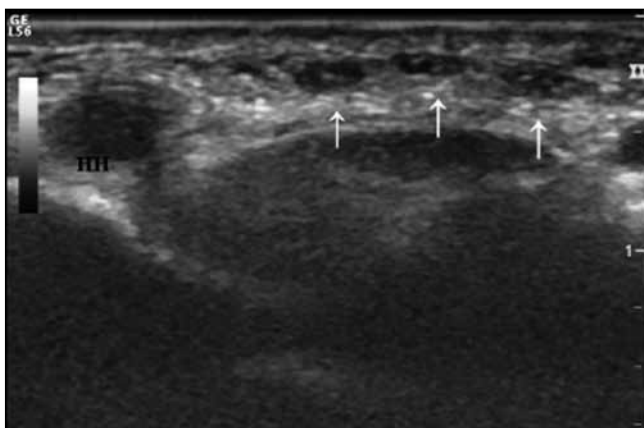


Figure 3: Axial ultrasound image of the median nerve in the left wrist; white arrows shows the three branches of the median nerve at the level of the hook of the hamate (HH) bone.

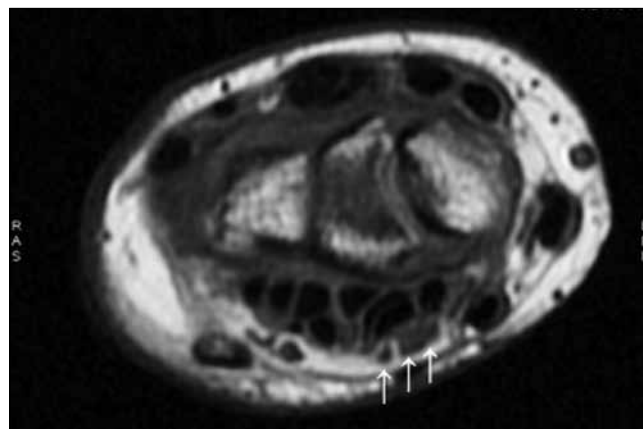


Figure 4: Axial T1-weighted MR image of the left wrist, three branches of the median nerve at the level of the radiocarpal joint (white arrows).

magnet (Signa; General Electric Medical Imaging, Milwaukee, WI) and a dedicated four-channel wrist coil also demonstrated the variations (Figure 4). After radiological evaluation, the patient was referred to the physical therapy and rehabilitation clinic for treatment.

DISCUSSION

Lanz described the various anomalies of the median nerve in the carpal tunnel and classified the bifid median nerve as Group 3 (3, 6). High division of the median nerve is named bifid median nerve.

In the present case, bilateral median nerve variation could be the cause of bilateral CTS. There was no reason detected in this patient except the variations. There was bifurcation and trifurcation of the median nerve in the right and left wrists respectively. When a median nerve variation is detected in one wrist, a possible variation at the other side should be kept in mind and hence should be evaluated. Bayrak et al. reported that bifid median nerve occurs relatively frequently in patients with CTS (1). Additionally, thorough knowledge of the variations of the median nerve makes it possible for the surgeon to avoid damage to the perineurium or epineurium or other parts of the branches and to ensure optimal patient outcome. US is an easy and cheap radiological method for diagnosis and it should be the first chosen radiological technique to evaluate median nerve variations in idiopathic CTS patients.

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