

Bifid median nerve associated with a carpal tunnel syndrome: diagnosis with Ultrasonography and Magnetic Resonance.

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Section: Musculoskeletal system

Imaging Technique: Ultrasound

Imaging Technique: MR

Imaging Technique: MR

Case Type: Clinical Cases

Authors: M. Almberger , G. Rossi, E. Iannicelli .

Patient: 30 years, female

Clinical History:

The authors describe a case of bifid median nerve associated with carpal tunnel syndrome

Imaging Findings:

A 30 year old female patient presented with a twelve month history of burning pain around the right wrist, paresthesia of the first three fingers , difficulties in fine fingers movements. Clinical diagnosis of carpal tunnel syndrome (CTS) relies on physical tests (Phalen's test) and on electromyography . The patient underwent Ultrasound examination, performed by a 10 MHz transducer , of the carpal tunnel which demonstrated on axial scans the presence of two close oval formations with a fascicular hypoechoic structure. This echotexture structurally was similar to nervous tissue and consistent with early bifurcation of the median nerve. The single median nerve was clearly identified in the distal forearm and subsequently splitted. MR Spin - Echo T1 and T2 weighted axial scans confirmed the sonographic findings showing two structures in the normal anatomic site of the median nerve, referred to a bifid median nerve . The signal intensity of the two branches was increased in SE-T2-weighted sequences, presumably indicating a compression-induced edema. No other pathologic findings within the carpal tunnel were detected. The open surgical treatment confirmed the early bifurcation of the nerve inside the carpal tunnel. No other anomalies were found. The patient became symptom free 25 days after surgical treatment.

Discussion:

Carpal tunnel syndrome (CTS) is a neuropathy caused by compression of the median nerve in the carpal tunnel which is secondary to all pathologic conditions determining either reduction in size of the carpal tunnel or increase of the tunnel content. Anatomic variation of the median nerve at wrist which may be associated with carpal tunnel syndrome (CTS). Lanz [1] defined four group of variations found in this nerve in the carpal tunnel: I) variations of the course of the thenar branch; II) accessory branches at the distal portion of the carpal tunnel; III) divided or duplicated median nerve inside the carpal tunnel and IV) accessory branches proximal to the carpal tunnel. Anatomic variant of the median nerve occurred at our attention was represented by early duplication of the median nerve inside the carpal tunnel which corresponds to the III class of Lanz's classification [1]. Group III of Lanz classification is more frequently associated with CTS [1] since the two branches run parallel in the tunnel causing increase of the tunnel content with subsequent compression of the median nerve. It is important for the surgeon to know preoperatively of this anatomic variation for carpal tunnel release. Since the open surgical approach is the

treatment of choice the endoscopic release has to be avoid in these case [2-3].

Differential Diagnosis List: Add median nerve duplication

Final Diagnosis: Add median nerve duplication

References:

Lanz U: Anatomical variations of the median nerve in the carpal tunnel.

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Tennent TD, Goddard NJ: Carpal tunnel decompression: open vs endoscopic.

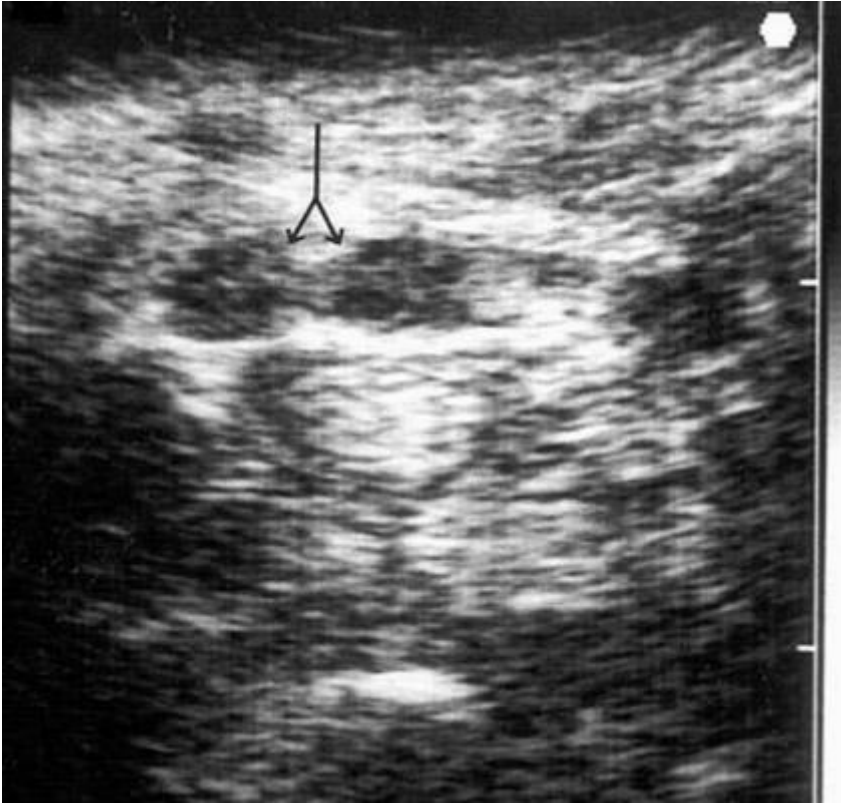
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Szabo RM, Pettey J: Bilateral median nerve bifurcation with an accessory compartment within the carpal tunnel.

J Hand Surg [Br]. 1994 Feb;19(1):22-3. (PMID: [8169470](#))

Figure 1

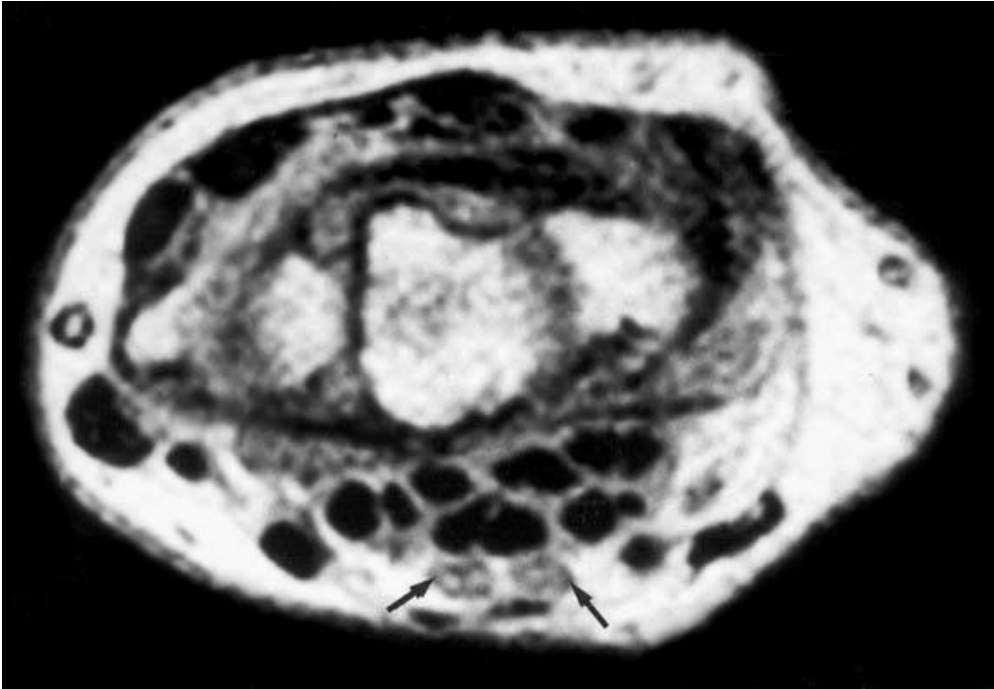
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Description: Axial US scans at the level of the first row of the carpal bones show the two branches of the nerve which have the same size (arrows). **Origin:**

Figure 2

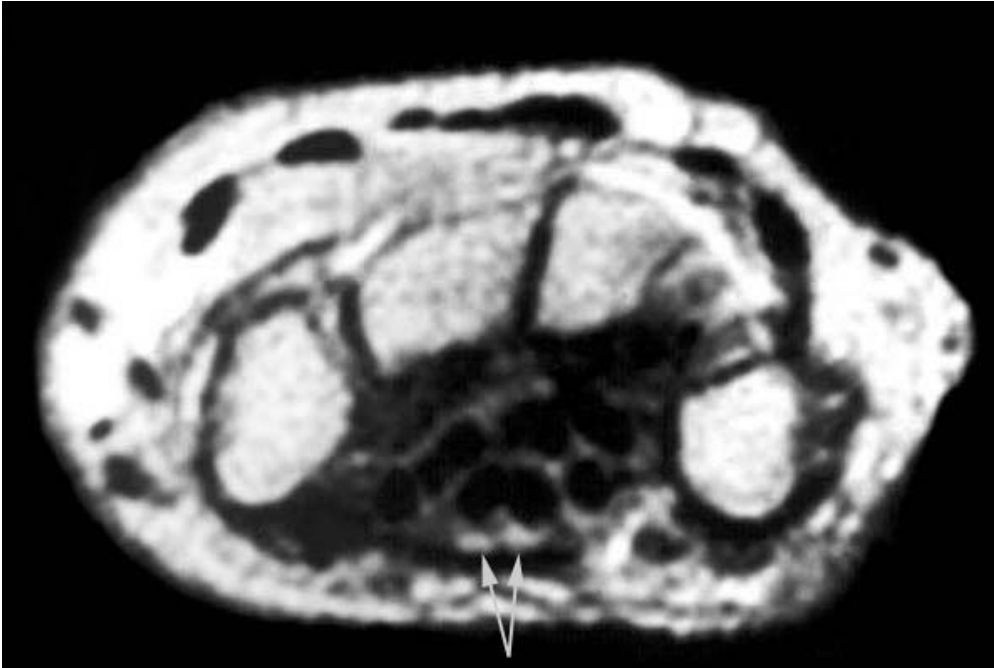
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Description: Axial MR image SE T1-weighted, confirms the presence of the two branches of the median nerve (arrows). **Origin:**

Figure 3

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Description: Axial MR image SE T2-weighted confirms US findings and shows increased signal intensity of the two branches of the nerve (arrows). **Origin:**