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Case Report

A Wrist Median Nerve Schwannoma: A Case Report

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Abstract

Schwannoma's are benign tumors that can affect all nerves even the peripheric nerve. In the present study, a 66 year old case (man) which had a mass upon his wrist with a diagnostic delay of two years has been studied. Diagnosis was based on imaging features (Ultrasonography and MRI) with Electromyography (EMG) which was assessed by histopathological examination.

Keywords: Schwannoma, Wrist, Median Nerve, MRI

Introduction

The schwannoma's are benign tumor which grows at the expense of schwann cells of the nerve sheath. The most common localizations are depending central nerve's specially the cochleovestibular nerve. However, it can be found in peripheric nerves and it is regarded as the most common benign peripheral nerve tumor. When these tumors are small, they are usually painless and are responsible for diagnostic delay. However, when they start to get larger they can be responsible for paresthesias, pain and motor weakness. Imaging, especially MRI, and ultrasonography in addition to Electromyography (EMG) are the principal explorations for diagnosis providing a large set of information that helps for the diagnosis. In the present study, a case of a median nerve schwannoma in a 68 year old patient has been reported who developed a wrist nodular mass which was revealed to be a median nerve Schwanomma through imaging.

Case Report

In the present study, a 68 year old man who had been working as an institutor and was a hypertensive patient, presented a nodular mass upon the ventral side of the wrist. This mass had appeared about two years ago without any other sign such as paresthesias or motor weakness. This motivated our patient to consult a traumatologist. The clinical examination has shown a well circumscribed mass upon the ventral side of the wrist. This mass was a soft mass attached to deeper tissues and the percussion over the mass provoked paresthesias along the path of the median nerve (tinel like sensation). These findings led the clinician to prescribe an ultrasonography and an EMG which has shown the following features:

The ultrasonography has shown the following features (Figure 1):

- An ovalar well circumscribed hypoechoic mass depending on the peripheric part of the median nerve measuring
- This mass is well vascularized on Doppler color and energy
- This mass is located between FCR and palmary longus
- Without any visible communication with the tendons or the joint capsule.

EMG has shown the following features:

- A conduction block depending on the median nerve at the level of the wrist estimated at 50% without any alteration of the motor distal latency or the motor conduction velocity
- The parameters of the sensitive branches of the median nerve were completely normal

Following those examinations, a tumor depending on the median nerve was truly suspected and an MRI of the wrist was performed for better characterization following this protocol:

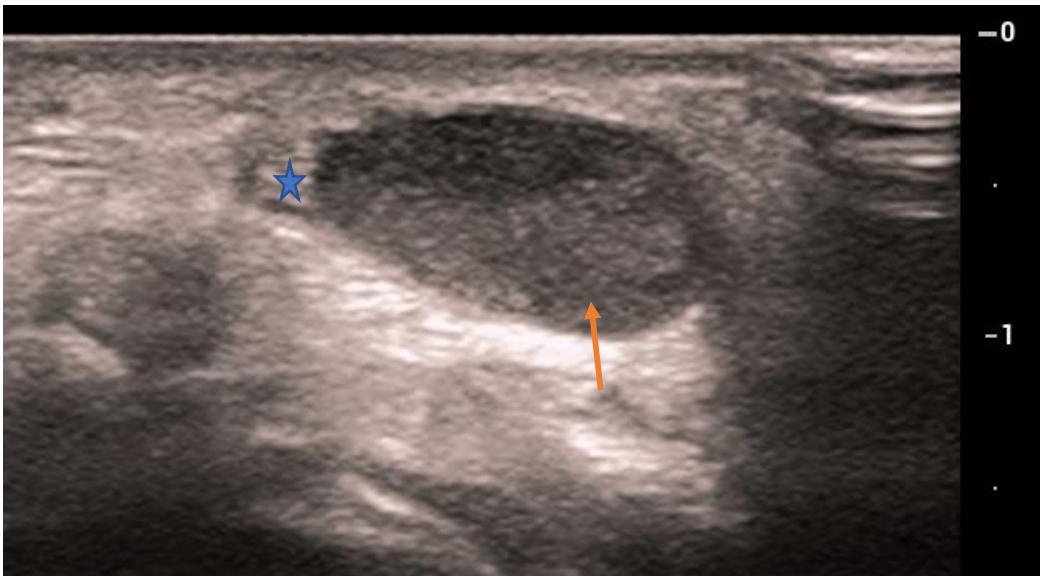

Figure 1A. Ultrasonography Showing an Ovalar Well Circumscribed Hypoechoic Mass ( ) Depending on the Peripheric Part of the Median Nerve ( ).

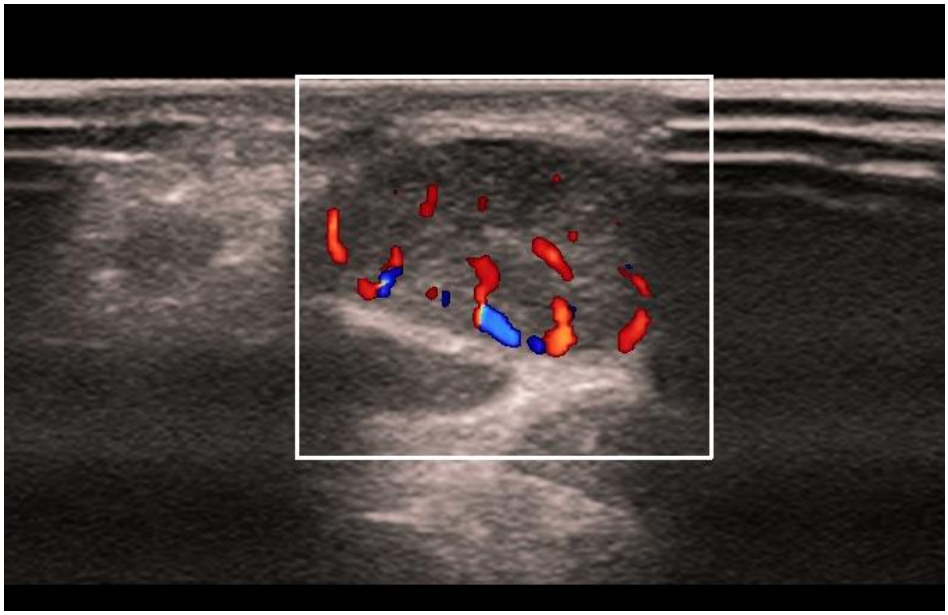

Figure 1B. Doppler Ultrasonography Showing a Good Vascularization of the Mass.

- A T1 weighted sequences on sagittal and coronal planes
- A T2 FATSAT sequences on sagittal axial and coronal planes
- A T1 FATSAT sequences on sagittal axial and coronal planes

The MRI has found depending the palmar side of the wrist upon the superior part of the palmar tunel an ovoid encapsulated mass measuring 14x19x7 mm. This mass has an intermediate signal on T1 weighted images and a homogenous high signal in T2 weighted sequences. After Gadolinium administration, this mass had a heterogeneous enhancement (Figure 2 and 3).

Furthermore, this mass is developed depending on the peripheric part of the median nerve and seems to push back it's nervous fibers.

After all these examinations, a surgery was performed which consisted of a mass resection. The anatomo-pathological findings have confirmed the diagnosis by stating a median nerve schawannoma.

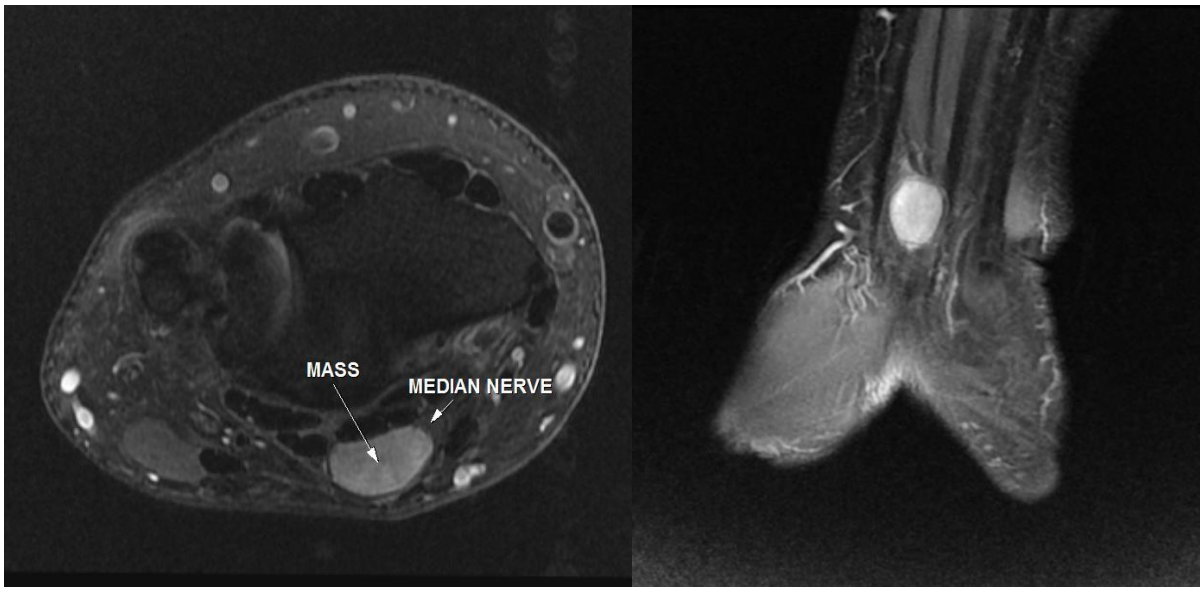

Figure 2. MRI of the Wrist in T2 FATSAT Weighted Sequences on Axial (A) and Coronal Plans (B) Showing an Encapsulated Mass Depending on the Peripheric Parts of the Median Nerve in Homogenous High Signal.

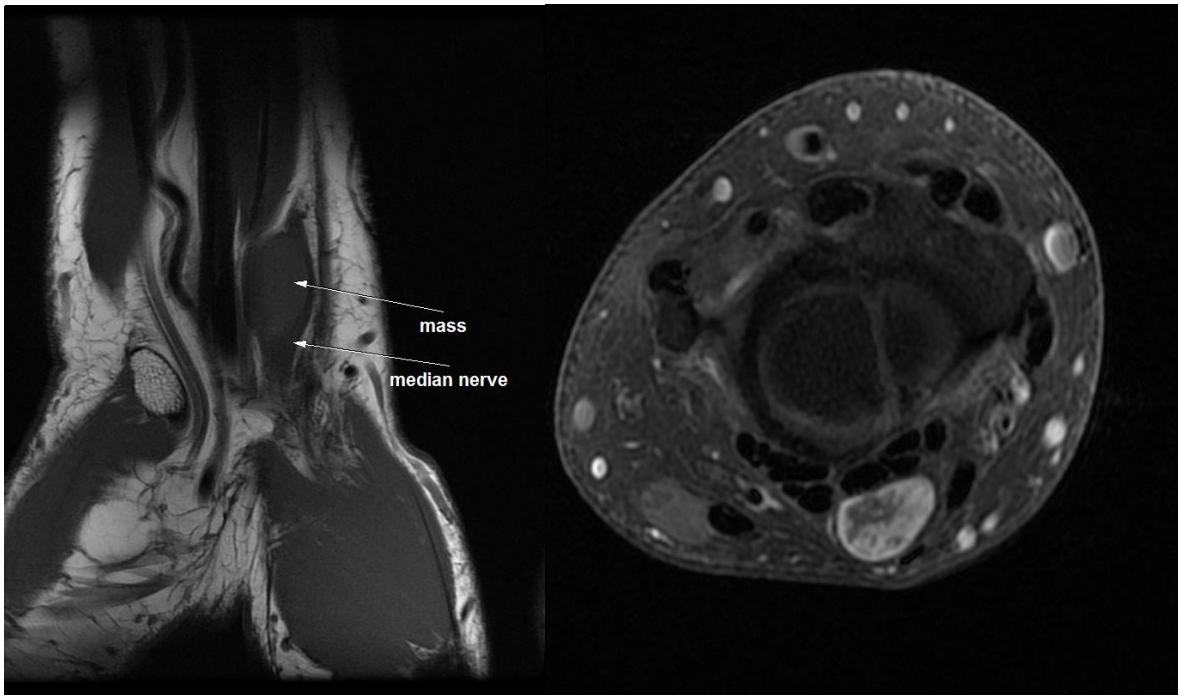

Figure 3. MRI of the Wrist in T1 Weighted Sequence in Sagittal Plan (A) and on T1 FATSAT Sequence after Gadolinium Administration in Axial Plan (B) Showing an Encapsulated Mass with an Heterogenous Enhancement after Gadolinium Administration.

Discussion

Benign nerve sheath tumors are rare conditions in which there is an abnormal growth within the cells of this covering. Schwannoma's and neurofibromas are the most common histological type.[1] Schwannomas are common, slowly growing, and encapsulated benign nerve sheath tumors separated from the surrounding tissues. Some forms may be localized within the nerve trunk or bundles of nerve fibers spreading over the surface of the tumor.[2] Epidemiologically, they are regarded as the most common peripheral nerve tumors in adults. They usually occur when the individual is between 30 and 50 years old, with no significant difference regarding ethnicity or gender.[3] Accordingly, the ulnar and median nerves are the most affected nerves.[4] Many studies have investigated median nerve schwannoma but only a few[5,6] have studied it's involvement on the wrist. The schwannoma is developed

in the nerve sheath, and can occur anywhere within the peripheral nervous system. In most cases, these tumors are asymptomatic, and occasionally small palpable tumor mass, with few or no neurological deficit.[7] It can produce pain, a positive Tinel's sign or a Tinel's-like sensation, and sensory alterations.[2] The slow growth pattern of benign nerve tumors allows for adaptation of the nerve function to the pressure effects.[8] The slow growth allows a nervous adaptation which is responsible for the diagnostic delay. In our case, the delay was about two years whereas Akambi Sanoussi and Dubert have estimated an average period delay of nine months.[9] If ENMG can guide the clinician about median nerve damage especially in advanced tumors; imaging is the key for preoperative diagnosis and extension of those tumors. Although they do not have specificity, they are endowed with a certain diagnostic value, and some radiological characteristics can help doctors differentiate these tumors, helping to guide their approach.[10] On US, schwannomas are seen as well-defined, ovoid, heterogeneous masses most often in the peripheric part of the nerve.[11] The presence of blood flow on the Doppler can distinguish a peripheric nerve steam tumor from a cystic lesion.[7] The MRI enables the characterization of lesions with neural involvement, their relation to important anatomical structures, and the extent of intrinsic or extrinsic nerve involvement.[7,11] The lesion is seen as a well-defined mass in fusiform shape, located within the peripheric part of the nerve, iso- or hypo intense in the signal related to the skeletal muscle in T1-weighted images, and with increased signal intensity and slightly heterogeneous in T2-weighted images.[11] Gadolinium enhanced MRI is useful in the diagnosis of Schwannomas, with the characteristic "target sign", that is a biphasic or triphasic pattern, in which the periphery has a higher intensity on the T2 sequence and low intensity on the Gadolinium enhanced T1 and vice versa on the central part. It has been shown to have a specificity of 100% and a sensitivity of 59% in a histologically verified study by Koga et al.[12] Schwannomas and Neurofibromas are not always easy to distinguish and radiological signs suggest that the former is in an eccentric position in relation to the parent nerve and heterogenous appearance. Calcifications can be seen in chronic lesions, the so-called ancient Schwannomas.[13] Surgical excision is regarded to be the most effective method of therapy by many scientists;[14] however some prefer to only excise symptomatic tumors or those demonstrating enlargement during follow-up.[15] Careful microsurgical dissection is important[16] by using a loupe or microscopical magnification in order to avoid the nerve fibers damages during the epineural and endoneurial dissection. Paresthesia is the most common postoperative complication.[17] The surgeon should be careful not to make unnecessary sacrifice of functionally important motor and sensory branches.[6]

Conclusion

Schwannoma's are considered to be benign tumors depending on the schwann cells of the nerve sheath. if they are most frequently depending the central nerves they can also affect peripheric nerve and are regarded as the most frequent histologic type of peripheric nerve tumors. These tumors are often asymptomatic and are actually responsible for diagnostic delay. Imaging, especially MRI, represents the gold standard for the diagnostic providing a large set of information for the diagnosis.

Conflict of Interest

The authors declare no conflicts of interest.

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