



12-31-2011

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#### Recommended Citation

Chen, Pon-An; Lai, Chung-Liang; Tsai, Ming-Miau; Leu, Chuan-Chin; and Wang, Tyng-Guey (2011) "Wrist Schwannoma Mimicking De Quervain's Disease: A casereport," *Rehabilitation Practice and Science*: Vol. 39: Iss. 3, Article 7.

DOI: [https://doi.org/10.6315/2011.39\(3\)07](https://doi.org/10.6315/2011.39(3)07)

Available at: <https://rps.researchcommons.org/journal/vol39/iss3/7>

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## Case Report

# Wrist Schwannoma Mimicking De Quervain's Disease: A Case Report

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For decades, ultrasonography has shown a high degree of accuracy in the evaluation of soft tissue tumors. In this study, we report the condition of a 80-year-old male patient who had been suffering from left thumb pain for 2 years. The patient had initially been diagnosed with de Quervain's disease, but responded poorly to conservative treatment. An ultrasonographic examination unexpectedly identified a well-margined solid tumor with marked vascularity. Suspicion of a neurogenic tumor led to an excision surgery and finally pathology revealed a Schwannoma. Following excision, the symptoms were entirely ameliorated. We concluded that, in the evaluation of persistent chronic tenosynovitis, ultrasonography ought to be mandatory, due to its effectiveness in detecting tumors and structural abnormalities. (Tw J Phys Med Rehabil 2011; 39(3): 181 - 186)

**Key Words:** ultrasonography, de Quervain's disease, tendinopathy, schwannoma

## INTRODUCTION

De Quervain's disease is an inflammation or degeneration of the extensor pollicis brevis (EPB) and abductor pollicis longus (APL) tendons.<sup>[1,2]</sup> Symptoms include pain, tenderness, and swelling on the radial side of the wrist. Patients with de Quervain's disease often have difficulty of gripping objects and usually feel weak when holding objects. In addition, resistance testing of thumb extensions or abductions also causes pain.<sup>[2,3]</sup> Finkelstein's test, in which an individual passively stretches these two tendons, is useful for diagnosing de Quervain's disease,<sup>[2,4]</sup> and the implementation of clinical symptoms generally

facilitates diagnoses.<sup>[2,3]</sup>

Ultrasonographic examinations are commonly used to evaluate pain in soft tissue as well as tendon disorders, e.g. tendon tears, inflammation, or degeneration.<sup>[5-7]</sup> Herein, we present a case featuring typical clinical indications of de Quervain's disease, but showing poor response to conservative treatment. An ultrasonographic examination identified a Schwannoma located below the APL and EPB, and an excision of the tumor relieved symptoms entirely.

## CASE REPORT

A 80-year-old male patient first experienced pain in the left thumb in 2007. The pain occurred when he

Submitted date: 7 December 2010

Revised date: 20 April 2011

Accepted date: 2 May 2011

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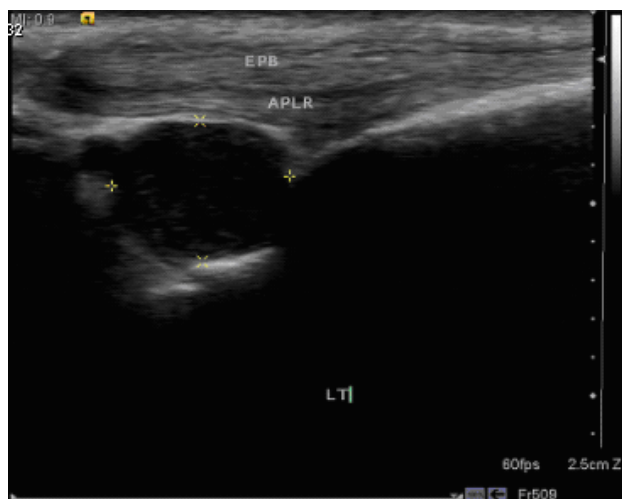
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extended his left thumb or carried heavy objects. During an initial visit to a local hospital, the patient was diagnosed with de Quervain's disease. The patient was provided conservative treatment for several months; however, all measures proved ineffective. Despite receiving a tenosynovectomy in 2009, the symptoms were still unrelieved. The patient visited several local hospitals where the problem was generally treated as tendonitis. Nevertheless, the pain in the left wrist persisted. On May 9th, 2010, the patient visited our outpatient clinic. A physical examination revealed local tenderness over the left APL & EPB tendons and weakness in the left thumb during resistance testing. The Finkelstein test was positive. Neither numbness, Tinel's sign nor local swelling was identified, despite the lack of local heat or erythema. Initially de Quervain's disease was suspected; however, due to the persistence of symptoms following the operation, an ultrasonographic examination was arranged.

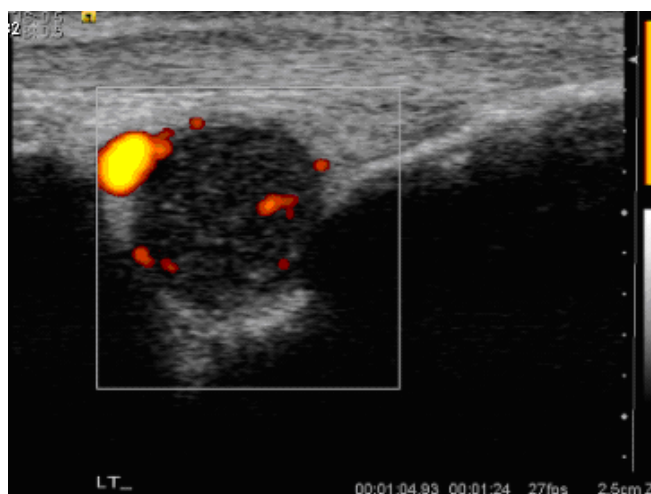
An ultrasonography examination of the left wrist illustrated a hypoechoic well-margined mass with size of  $9.3 \times 7.3 \times 11.6$  mm located below the APL and EPB tendon (Figure 1). There was no connection between

tumor and tendon. A moderate increase in vascularity within the tumor, combined with a mild posterior enhancement without destruction of the bone. Differential diagnosis including ganglionic cyst, giant cell tumor and neurogenic tumor. However, because of moderate increased vascularity and no connection between tumor and tendon, finally we thought a neurogenic tumor should be considered first.

Following initial suspicions of a neurogenic tumor, magnetic resonance imaging (MRI) revealed a circumferential soft tissue tumor approximately  $1.7 \times 1.0 \times 1.5$  (length  $\times$  width  $\times$  height) cm located within the radial aspect of the left wrist (Figure 2). The tumor appeared with an intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted images. Beak-like protrusions extending toward the neurovascular bundles at the distal aspect of the tumor. There is no significant enhancement revealed inside the tumor during arterial-phase with contrast media. A benign tumor associated with the peripheral nerve sheath was first suspected.



1A



1B

Figure 1. (A) Ultrasonographic images showing a well margined heterogenous hypoechoic round mass (between markers) with a size of  $9.3 \times 7.3$  mm in the longitudinal view, just beneath the abductor pollicis longus tendon (EPB: extensor pollicis brevis, APLR: abductor pollicis longus). (B) Power Doppler image showing increased vascularity within the mass.



Figure 2. Circumferential soft tissue tumor (arrow) with high signal intensity on T2-weighted images following homogenous enhancement along the radial aspect of the left wrist. A reference point (arrowhead) located out of radial styloid process.

The patient was referred to an orthopedic surgeon and the tumor was excised without complications. The operation revealed a yellowish gel-like contented tumor mass with a cystic lesion within the radial side of wrist. The final pathology identified the tumor as a Schwannoma. Following the excision, the wrist pain of the patient disappeared quickly and completely.

## DISCUSSION

In this study, we presented a case of left wrist pain with clinical symptoms similar to those of de Quervain's disease. Eventually, a Schwannoma was discovered through ultrasonographic examination and identified according to its pathology. Symptoms and signs were relieved following the excision of the tumor. De Quervain's disease (tendinopathy of the APL and EPB) is a common disease causing radial wrist pain.<sup>[2,3]</sup> This problem is common in women,<sup>[3]</sup> particularly during pregnancy or postpartum.<sup>[8,9]</sup> Activities requiring the repetitive thumb extension and abduction may contribute to de Quervain's disease. These activities include factory work, secretarial duties, golfing, or playing racket ball.<sup>[2,3,10]</sup> According to clinical symptoms, de Quervain's disease is generally easy to diagno-

sis.

A differential diagnosis includes osteoarthritis of the first carpo-metacarpal (CMC) joint, intersection syndrome, Wartenberg's syndrome, and ganglia. A patient with osteoarthritis in the 1st CMC joint presents tenderness, stiffness, crepitus, swelling, and pain in the CMC joint,<sup>[11]</sup> particularly while moving the joint. A grind test is often positive for osteoarthritis of CMC joint, but negative for de Quervain's disease. An intersection syndrome is a painful condition of the radial side of the forearm,<sup>[12]</sup> caused by an irritation of the upper set of tendons in the wrist (approximately 4 cm proximal to the wrist joint). This occurs because the tendons of the first compartment (APL, EPB) compress the tendons of the second compartment (extensor carpi radialis longus and brevis) proximal to the extensor retinaculum. Repetitive extension of the wrist, as with rowing, weight lifting, or pulling exacerbates symptoms. The pain associated with the intersection syndrome is more proximal than that of de Quervain's disease.

The compression of the superficial branch of the radial nerve is the cause of Wartenberg's Syndrome. This commonly occurs over where the nerve exits from beneath the brachioradialis in the forearm. Symptoms including numbness and pain in the dorsal and radial areas of the hand, exacerbating with the forced grip of the pinch and resisted pronation of the forearm.<sup>[13]</sup> The wrist is a common site for ganglia,<sup>[5,14]</sup> which are cystic swellings originating in a joint capsule or tendon sheath. Ganglia cause wrist pain, but palpations of a mass during physical examinations often help to distinguish them from tenosynovitis. In this case, the patient had pain at the radial side of wrist without numbness, and the pain occurred during thumb extensions unrelated to the movement of CMC joint. Based on these points in the clinical evaluation, de Quervain's disease was the most likely candidate.

Treatment for de Quervain's disease includes rest, ice, anti-inflammatory medications, thumb spica splints, electrical stimulation, and iontophoresis. For years, these treatments have been applied to alleviate pain, but without solid scientific evidence as to their effectiveness.<sup>[2]</sup> Injection of corticosteroid into the peritendinous region of the first dorsal compartment has resulted in the successful treatment of 62-100% of cases.<sup>[15]</sup> After controlling for pain, a

rehabilitation program addressing flexibility, strength, and endurance training should be undertaken. Kinetic chain deficits must be identified and corrected.<sup>[15]</sup> If conservative treatment fails, surgical intervention is indicated. Surgery involves the decompression of the first extensor compartment with or without tenosynovectomy. The success rate of this surgery is higher than 80 to 90 %.<sup>[16,17]</sup> In this case, the patient received ample conservative treatment and once surgical treatment, but the symptoms could not be controlled. This implied the existence of an additional or alternative pathology causing the wrist pain.

Compared to MRI, ultrasonographic examinations are relative low-cost, noninvasive, and readily-available for dynamic examinations.<sup>[18]</sup> They are most frequently implemented for the detection of tearing in tendons, evaluation of soft tissue mass, and differentiation of inflammatory or degenerative disease. Furthermore, ultrasounds enable the delivery of therapeutic agents into joints and enthesial sites more accurately.<sup>[19]</sup> Ultrasonographic examinations detect the thickness of the first compartment retinaculum, the thickness of tendons (APL, EPB), tendon sheath effusions, and the vascularity of de Quervain's disease.<sup>[7,19,20]</sup> For the patient in this report, the APL and EPB tendon remained intact. Unexpectedly, one hypoechoic well-margined mass with increased vascularity was discovered below the APL tendon, ultimately leading to the reassessment of our diagnosis.

Schwannoma is also known as an "acoustic neuroma", "neurilemmoma", "neurinoma" "neurolemmoma" and "Schwann cell tumor". It is a benign nerve sheath tumor comprising Schwann cells,<sup>[21]</sup> which normally produce the insulating myelin sheath covering peripheral nerves. Schwannoma is the most common benign tumor that develop in peripheral nerves and the most common primary neural tumor of wrist and hand.<sup>[22]</sup> They account for 5% of all tumors<sup>[23]</sup> in the upper extremity. Schwannoma presents as a slow-growing mass, and usually appear as painless swelling for several years before being diagnosed.<sup>[22]</sup> Preoperative evaluation is based on ultrasonography and MRI; however, final diagnoses require histopathology. Schwannoma can be found in any part of the upper limb with peripheral nerve travel. According to majority of literature, median nerve distribution is the most common site in the wrist and hand, followed by ulnar nerve, than radial nerve.<sup>[22]</sup>

The clinical manifestation is primarily including Tinel' sign, paresthesia, pain and weakness, however, pain resulting from compression of the surrounding soft tissue may also occur (as it did with this patient), especially during work or movement.

We conclude that an ultrasonographic examination should be mandatory for cases with clinical impression of de Quervain's disease that remain unresponsive to treatment. In addition to evaluating the status of tendons, ultrasonographic examinations provide a convenient differential diagnoses of diseases.

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## 許旺氏細胞瘤引起類似 De Quervain 氏症：病例報告

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近十年以來，超音波檢查常常被應用在軟組織腫瘤的評估。隨著影像技術進步與醫學影像的發展，評估病灶準確度也越來越高。在這個病例報告中，一個 80 歲的男性從兩年多前開始左拇指疼痛，症狀與臨床表現與 de Quervain 氏症相同，所以一直以來被當作 de Quervain 氏症治療。由於保守治療反應不佳，病患於一年後接受了筋膜放鬆手術(tenosynovectomy)，不過術後並無如預期復原，病患的左拇指持續疼痛。在沒有改善的情形下，病患於是來到大醫院就醫，於是幫他安排了超音波。檢查結果發現一顆 9.3 × 7.3 × 11.6 mm 的腫瘤，位於外展拇長肌腱(abductor pollicis longus tendon)下方，邊緣清楚，內部呈現均質低回音，血管訊號增加，初步懷疑是神經性腫瘤(neurogenic tumor)。在接受核磁共振造影檢查證實後，病患決定接受腫瘤切除，病理報告證實是許旺氏細胞瘤(Schwannoma)。腫瘤切除後，病患的症狀完全恢復。

結語：超音波檢查提供了快速、方便、不具侵犯性的優點，特別在動靜態結構檢測為其強項。對於一些保守治療甚至手術治療均無效的肌腱炎病患，超音波可納入常規檢查，幫助排除腫瘤、空間佔據病灶、動靜態結構異常、及其他比較罕見的病因。(台灣復健醫誌 2011；39(3)：181 - 186)

**關鍵詞：**骨骼肌肉超音波(ultrasonography)，de Quervain 氏症(de Quervain's disease)，肌腱病變(tendinopathy)，許旺氏細胞瘤(schwannoma)