

## Introduction

Carpal tunnel syndrome is a prevalent condition, affecting approximately 1-5% of the general population (1). The prevalence of median nerve schwannomas among patients diagnosed with carpal tunnel syndrome is largely unknown and the available literature is limited to case reports (2,3). The pathophysiology and natural history of schwannomas in patients with carpal tunnel syndrome is also unclear.

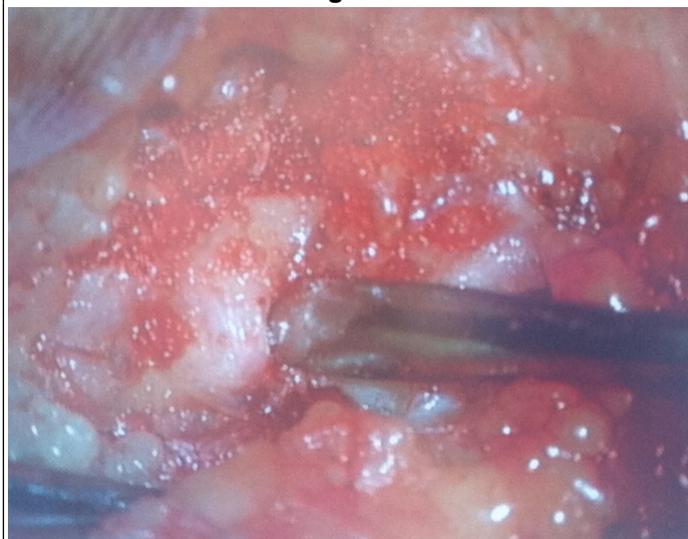
## Methods

A Retrospective single-institution chart review from January 2013 to March 2015 was performed in order to determine the incidence of median nerve schwannomas in patients diagnosed with carpal tunnel syndrome undergoing surgery for carpal tunnel release.

## Results

Median nerve schwannomas were found intra-operatively in 2/72 (2.7%) patients. Patient 1 was a 51 year-old male, and patient 2 was a 53 year-old female. In addition to the severe median nerve neuropathy on the right hand the EMG of upper limbs in patient 1 showed also an acute right C6 radiculopathy. The cervical spine MRI demonstrated C5-C6 spondylosis with marked right-sided foraminal stenosis. The EMG on patient 2 demonstrated only moderate median neuropathy in the wrists, bilaterally, worse on the right. Both patients had preserved full motor strength on pre-operative assessment. Intra-operatively, small benign-appearing tumors (2 tumors in patient 1 and 1 tumor in patient 2) originating from the median nerve fascicles were noted, suggestive of schwannomas (Figure 1 and 2). In order to avoid any possible risk of post-operative motor deficits, in both cases tumor resection was deferred in favor of only decompression of the median nerve. In patient 1, an additional C5-C6 arthroplasty was performed. At 3 months follow-up, both patients reported significant improvement in the symptoms of pain and numbness as well as maintained full motor function.

**Figure 1**



Intra-operative pictures of patient 1. The Penfield 4 instrument points the benign-appearing lesion compatible with a schwannoma originating from the most distal portion of the median nerve.

**Figure 2**



Intra-operative picture of patient 2. Two oval-shaped hard tumoral lesions originating from the median nerve were visualized after opening of the transverse carpal ligament which presented severe hypertrophy.

## Conclusions

Our findings suggest that the prevalence of median nerve schwannomas among patients with carpal tunnel syndrome may be greater than previously thought. Carpal tunnel release alone seems to effectively provide symptomatic relief in most patients. However serial MRIs of the affected wrist are recommended in order to monitor any possible tumor growth. Future prospective studies are required to investigate the natural history of median nerve schwannomas in patients with carpal tunnel syndrome and to determine the role of resection versus observation in the management of such lesions. Additionally future basic science studies are warranted in order to investigate the pathophysiology of such lesions which may involve reactive processes in the nerve secondary to repetitive trauma caused by the hypertrophic transverse carpal ligament.

## References

- [1] Atroshi I, Gummesson C, Johnsson R, Ornstein E, Ranstam J and Rosen I. Prevalence of carpal tunnel syndrome in a general population. JAMA 1999; 282: 153-158.
- [2] Aslam N and Kerr G. Multiple schwannomas of the median nerve: a case report and literature review. Hand Surg 2003; 8: 249-252.
- [3] Hubert J1, Landes G, Tardif M. Schwannoma of the median nerve. J Plast Surg Hand Surg. 2013 Feb;47(1):75-7.

## Learning Objectives

1. To understand that the incidence and natural history of median nerve schwannomas in patients presenting with symptoms of carpal tunnel syndrome are largely unknown in the literature.
2. To acknowledge that future research is necessary in order to provide a better understanding on the pathophysiology and natural history of median nerve schwannomas in patients with carpal tunnel syndrome.
3. To recognize that, while carpal tunnel release seems to effectively alleviate the symptoms in most patients, the role of resection versus observation in the management of median nerve schwannomas is unknown, warranting further investigation.