The Utility of Ultrasound in Determining the Etiology of Failure in Ulnar Nerve Transposition

Michael M. Vosbikian, MD[1], T. David Tarity, MD[1], Asif M. Ilyas, MD[2]
1 – Department of Orthopaedic Surgery – Thomas Jefferson University Hospital (Philadelphia, PA)
2 - The Rothman Institute of Orthopaedics at Thomas Jefferson University Hospital (Philadelphia, PA)

Introduction:

Cubital tunnel syndrome is the second most common peripheral nerve entrapment in the upper extremity. Often times, this patient population undergoes ulnar nerve transposition for management. While the sonographic findings in cubital tunnel syndrome are well documented, there is little published literature regarding the mechanisms of failure in the postoperative symptomatic ulnar nerve. To better determine if there is a role for sonography in determining the cause of postoperative symptomatology, sonograms of the ulnar nerve in patients who have failed ulnar nerve transposition were examined in order to determine if there is a reproducible finding on these imaging studies that may lead to finding a mode of failure.

Methods:

A retrospective review of 68 consecutive ulnar nerve sonograms from January 2007 to February 2012 was performed for patients had failed transposition. Failure was defined as persistence or recurrence of preoperative symptomatology. The cross sectional area (CSA) of the nerve, subjective echogenicity, and sites of nerve compression were recorded for each imaging study. These data were analyzed to determine if there was a commonality amongst this patient population.

Results:

The group that failed transposition had a mean CSA of 17.26 ± 9.93-mm^2, which is significantly larger than published studies regarding the CSA of the ulnar nerve in patients with cubital tunnel syndrome as well as in the normal ulnar nerve. In our series, the nerves that had failed transposition did not have a consistent change in sonographic echogenicity, nor did many nerves show a definitive location of postoperative residual compression that would be indicative of a specific site of failure.

Parameter	Study Group	Control Group	Significance
Total Patients	68	48	N/A
Male	44	27	No (X^2=0.36)
Female	24	21	
Age (years)	45.6	50.35	No (p=0.056)
Hypoechogenicity	47 (69.1%)	37 (77.1%)	No (p>0.05)
Maximal CSA (mm^2)	17.26	13.45	Yes (p=0.018)
Focal Compression	15 (22.1%)	28 (58.3)	Yes (p=0.0001)

Discussion:

Patients that have failed ulnar nerve transposition show an enlarged CSA when compared to both symptomatic nerves in situ as well as normal ulnar nerves. However, they do not often show a specific site of compression or changes with respect to echogenicity. In many cases, with sonography, a specific etiology for these failures cannot be determined. Due to the frequency of essentially negative studies in symptomatic patients, these data suggest that the utility of sonography in determining the etiology for failed ulnar nerve transposition may not be as high yield as is seen in cubital tunnel syndrome.