SCIENTIFIC ARTICLE

Comparison of Shoulder Internal Rotation Test With the Elbow Flexion Test in the Diagnosis of Cubital Tunnel Syndrome

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Purpose To compare the shoulder internal rotation test—a new, provocative test—with the elbow flexion test in the diagnosis of cubital tunnel syndrome (CubTS).

Methods Twenty-five patients with CubTS were examined before and after surgery with 10 seconds each of the elbow flexion and shoulder internal rotation tests. Fifty-four asymptomatic individuals and 14 neuropathy patients with a diagnosis other than CubTS were also examined as control cases. For the shoulder internal rotation test, the patient's upper extremity was kept at 90° abduction, maximum internal rotation, and 10° flexion at the shoulder, with 90° elbow flexion and neutral position of the forearm and wrist, with finger extension. Test results were considered positive if any slight symptom attributable to CubTS occurred within 10 seconds. Extraneural pressure inside the cubital tunnel was intraoperatively measured with the positions of both the elbow flexion and shoulder internal rotation tests, in 15 of the CubTS cases. Statistical analyses were performed using Student's *t*-test with a confidence level of 95%.

Results The preoperative sensitivity in CubTS cases was 80% in the 10-second shoulder internal rotation test and 36% in the 10-second elbow flexion test, and these differences were significant. None of the control cases had positive results in either test. All the CubTS cases improved with surgery; after surgery, neither test provoked symptoms in any surgical patient. The extraneural pressure increased in both provocative positions with no significant difference.

Conclusions Positive results for the 10-second shoulder internal rotation test were more sensitive than that for the elbow flexion test of the same duration and seemed specific to CubTS. *(J Hand Surg 2011;36A:782–787.*

Type of study/level of evidence Diagnostic III.

Key words Cubital tunnel syndrome, ulnar nerve palsy, provocative test, shoulder internal rotation, ulnar neuropathy.

CUBITAL TUNNEL SYNDROME (CubTS) is the second most common compression neuropathy in the upper extremity.[1] Clinical evaluation, in combination with electrophysiological studies, is important for the diagnosis of CubTS.[1–4] The elbow flexion test[2] is the most standard provocative diagnostic test for CubTS[3–8]; however, its sensitivity is reported to be 86% to 93% after 3 minutes of continuous elbow flexion.[2]

We present a provocative test for the diagnosis of

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Received for publication July 13,2010; accepted in revised form December 13,2010.

We would like to thank Professor K. Nemoto and Dr. H. Arino at National Defense Medical College for helpful suggestions. We also would like to thank Dr. Y. Ito, Professor Y. Toyama, Dr. T. Matsumura, Dr. H. Ikegami, Dr. T. Nakamura, Dr. S. Iwabu, Dr. K. Sato, Dr. H. Saito, Dr. N. Okuyama, Dr. M. Okazaki, and other members of the hand surgery group of Keio University School of Medicine for helpful discussions. We also would like to thank Dr. M. Kihara, Dr. T. Koyanagi, Dr. N. Nakamichi, Dr. H. Morisue, Dr. E. Okada, Dr. T. Hasegawa, Dr. Y. Kaneko, and Dr. H. Tanigawa at the Department of Orthopaedic Surgery of Kawasaki Municipal Kawasaki Hospital for their clinical support.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

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0363-5023/11/36A05-0002$36.00/0
doi:10.1016/j.jhsa.2010.12.019

TABLE 1. Cubital Tunnel Syndrome Cases

		Before Surgery		Extraneural Pressure			After Surgery			
Case	Age (y)	Flexion Test	I/R Test	Flexion Test	I/R Test	Surgical Procedure	S/D	Flexion Test	I/R Test	Follow-up (mo)
1	76	−	+	NA	NA	MEL	−	−	−	28
2	48	−	+	NA	NA	DC	−	−	−	23
3	55	−	+	22	59	SCAT	−	−	−	24
4	57	−	−	NA	NA	MEL	−	−	−	13
5	81	−	+	NA	NA	SCAT	+	−	−	25
6	80	−	+	5	92	DC	−	−	−	20
7	59	−	−	11	59	SCAT	−	−	−	16
8	80	−	+	25	20	MEL	+	−	−	19
9	59	−	+	NA	NA	MEL	+	−	−	11
10	61	−	+	NA	NA	SCAT	−	−	−	25
11	34	+	+	4.5	8.5	MEL	−	−	−	12
12	58	−	−	NA	NA	DC	−	−	−	14
13	56	+	+	33	35	MEL	−	−	−	14
14	73	+	−	38	16	DC	−	−	−	11
15	54	−	+	32	49	MEL	−	−	−	10
16	63	+	+	NA	NA	SCAT	−	−	−	21
17	46	+	+	NA	NA	DC	−	−	−	11
18	73	−	+	0	31	SCAT	+	−	−	9
19	31	+	+	111	42	DC	+	−	−	16
20	57	+	+	81	71	MEL	−	−	−	15
21	57	−	+	11	27	DC	−	−	−	12
22	64	+	+	29	98	DC	−	−	−	11
23	65	−	+	NA	NA	DC	−	−	−	13
24	73	+	+	15	18	SCAT	−	−	−	14
25	60	−	−	57	5	SCAT	+	−	−	9

Postoperative sensation was normal or only minimally decreased in all the patients. I/R test, shoulder internal rotation test; DC, simple *in situ* decompression; MEL, medial epicondylectomy; SCAT, subcutaneous anterior transposition; S/D, sensory disturbance.

CubTS, the shoulder internal rotation test, that can provide useful data within 10 seconds. The purpose of this study was to compare the shoulder internal rotation test with the elbow flexion test in the diagnosis of the CubTS.

PATIENTS AND METHODS

Experimental group: CubTS cases

We evaluated 25 elbows of 25 patients (21 men and 4 women; age range, 31–81 y) who were diagnosed with CubTS (Table 1). All the patients complained of paresthesia and numbness in the ulnar nerve distribution, and their diagnosis was confirmed by electromyography, performed according to standard protocol.[9] Criteria for electrodiagnosis of CubTS were a slowing of conduction velocity to less than 50 m/s across the elbow and a decrease of conduction velocity of more than 15% at the elbow.[9] Patients unable to internally rotate their shoulders at least 70° were excluded from this study. All the patients complained of constant symptoms or muscle atrophy and, therefore, had either simple *in situ* decompression, medial epicondylectomy, or subcutaneous anterior transposition. The follow-up period after surgery was 9–28 months (mean, 16 mo). Postoperative examination using the elbow flexion and shoulder internal rotation tests was performed at their latest visit. Informed consent was obtained from each patient before enrollment in the study, and the study was approved by the institutional review board of the author's hospital.