COMPARISON OF THE OUTCOME OF ANTERIOR TRANSPOSION OF THE ULNAR NERVE VERSUS SIMPLE DECOMPRESSION IN CUBITAL TUNNEL SYNDROME

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Introduction

Cubital Tunnel Syndrome (CuTS) is the second most common compressive neuropathy of the upper limb, characterized by ulnar nerve entrapment at the elbow. Patients typically present with sensory disturbances (numbness, tingling in the fourth and fifth fingers) and motor deficits (weakness, muscle atrophy). When conservative treatments fail, surgical intervention becomes necessary to prevent irreversible nerve damage. The two primary surgical approaches are *simple decompression* (releasing the nerve without repositioning) and *anterior submuscular transposition* (relocating the nerve anteriorly to reduce tension). While transposition was historically preferred for severe cases, recent studies suggest comparable efficacy for decompression in mild-to-moderate CuTS. However, debate persists regarding optimal technique selection, complication rates, and long-term outcomes.

This study prospectively compares these techniques in 30 patients, evaluating clinical improvement, electrophysiological recovery, and ultrasonographic changes. By analyzing postoperative outcomes, we aim to clarify the superiority of one method over the other, guiding surgical decision-making for CuTS management.

Aim of the work

Compare the results for operative management of ulnar nerve entrapment at the elbow with either simple decompression or decompression with anterior submuscular transposition.

Patient and methods

This study was a prospective interventional trial involving 30 patients diagnosed with cubital tunnel syndrome based on clinical , electrophysiological (nerve conduction studies) amd ultrasonographic evaluations. Patients were recuited from the neurosurgery department of Alexandria Main University Hospital from July 2023 to December 2024 . The sample size was determined using Epi Info 7 software , with patients randomized into two groups : Group 1 (anterior submuscular transposition , n= 15) and Group 2 (simple decompression , n= 15) . Inclusion criteria included symptoms like numbness in the ring and little fingers or ulnar clawing , confirmed by nerve conduction studies .

Exclusion criteria excluded patients with systemic diseases , trauma , recurrent CuTS , or concomitant nerve entrapment . preoperative and postoperative assessments included motor power (MRC scale) , sensory function (Yale Sensory Scale) , McGowan classification , motor conduction velocity , and ultrasonographic cross-sectional area of the ulnar nerve . statistical analysis was performed using IBM SPSS , with significance set at p >/ = 0.05 .

Results

Table (1): Comparison of preoperative and postoperative clinical and electrophysiological parameters between study groups

	Preoperative		Postoperative		P_1	P_2	P_3
	Group 1	Group 2	Group 1	Group 2			
Motor Power					0.76	0.76	---
Grade 0	7 (46.7%)	6 (40.0%)	7 (46.7%)	6 (40.0%)			
Grade 1	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)			
Grade 2	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)			
Grade 3	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)			
Grade 4	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)			
Grade 5	8 (53.3%)	9 (60.0%)	8 (53.3%)	9 (60.0%)			
Sensory Assessment							
S0	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	---	<0.001*	<0.001*
S1	15 (100%)	15 (100%)	5 (33%)	2 (13%)			
S2	0 (0%)	0 (0%)	10 (67%)	13 (87%)			
McGowan Classification Severity					0.71	0.16	---
M1	8 (53.3%)	9 (60.0%)	8 (53.3%)	9 (60.0%)			
M2	7 (46.7%)	6 (40.0%)	7 (46.7%)	6 (40.0%)			
Motor Conduction Velocity Across Elbow					0.69	0.59	<0.001*
Min.	20	30	22	38			
Max.	56	50	65	65			
Mean ± SD	37.2 ± 10.5	38.6 ± 8.7	42.1 ± 12.3	44.8 ± 14.5			
Median	39.8	38	45	45			
CSA of the Ulnar Nerve (cm^2)					0.38	0.32	<0.001*
Min.	0.05	0.05	0.04	0.04			
Max.	0.29	0.19	0.13	0.14			
Mean ± SD	0.12 ± 0.07	0.10 ± 0.05	0.09 ± 0.02	0.08 ± 0.03			
Median	0.11	0.09	0.09	0.07			

Table (2): Distribution of studied cases according to postoperative patient satisfaction

	Group 1 (n= 15)		Group 2 (n=15)		x^2	p
	Number	Percentage	Number	Percentage		
Patient Satisfaction						
Satisfied	12	80.0%	13	86.7%	2.33	1.00
Not Satisfied	3	20.0%	2	13.3%		

Conclusion

Simple decompression achieves clinical, electrophysiological, and ultrasonographic outcomes equivalent to anterior submuscular transposition in mild-to-moderate cubital tunnel syndrome (McGowan M1/M2).

- Simple decompression showed higher sensory recovery than anterior transposition with statistically significant difference.