



Changes in Nerve Conduction Studies after Distal Radius Fracture Fixation using a Volar Approach and Locked Plate

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Introduction:

- The purpose of this study was to determine if there are changes in nerve conduction studies (NCS) of the median nerve after distal radius fracture (DRF) and to determine how operative fixation through a volar approach with a locking plate contributes to nerve conduction changes.
- We hypothesized that a significant percentage of patients would have electrodiagnostic evidence of median neuropathy at the wrist (MNW) after fracture, but fixation with a volar locked plate would not worsen the electrodiagnostic findings.

Methods:

- This was a prospective cohort study of fourteen neurologically asymptomatic patients who underwent surgical treatment of an isolated DRF using a volar plate.
- All patients underwent surgery within two weeks of injury. On the day of surgery and at the six-week follow-up, patients were clinically examined, quickDASH was completed, and patients underwent NCS using a hand-held device with the unaffected limb was used as a comparison.
- Pre-operative and post-operative nerve function were compared to the unaffected limb as a baseline.

Results:

- Patients without symptoms after DRF had a 28% incidence of prolonged latencies compared to reference values for the device used.
- Distal sensory latencies of the median nerve were 3.64 ± 0.32 ms in the unaffected arm, 3.76 ± 0.70 ms pre-operatively, and 3.81 ± 0.52 ms post-operatively.
- Distal motor latencies of the median nerve were 3.91 ± 0.59 , 3.60 ± 0.68 , and 3.88 ± 0.36 ms in respective arms and time points.
- QuickDASH scores improved from 77 pre-operatively to 46 at six weeks.

Conclusions:

- Asymptomatic patients may satisfy nerve conduction criteria for MNW after DRF, however open reduction and treatment with a volar locked plate has no significant effect on NCS findings.

Tables:

Table 1. Median Nerve Distal Motor Latency

Patient ID	Age	Motor Baseline	Motor Pre-op	Motor Post-op	Change
1	48	5.71	4.44	4.26	-0.18
2	25	3.84	3.85	3.84	-0.01
3	64	3.93	4.32	3.84	-0.48
4	43	3.89	3.42	3.34	-0.08
5	70	3.91	3.61	3.91	0.3
6	53	4.14	3.71	4.14	0.43
7	65	3.39	1.72	3.39	1.67
8	58	3.48	3.94	4.12	0.18
9	35	3.86	3.32	3.95	0.63
10	20	3.21	2.94	3.14	0.2
11	66	3.44	3.75	4.06	0.31
12	69	3.99	3.39	4.1	0.71
13	73	4.16	4.16	4.39	0.23
14	69	3.82	3.82	3.8	-0.02
Mean	54.14	3.91	3.60	3.88	0.278
SD	17.46	0.59	0.68	0.36	0.510
P Value			0.074	0.798	0.062

Table 2. Median Nerve Distal Sensory Latency

Patient ID	Age	Sensory Baseline	Sensory Pre-op	Sensory Post-op	Change
1	48	4.14	5.37	4.79	-0.58
2	25	3.61	3.71	3.61	-0.1
3	64	3.61	3.81	3.22	-0.59
4	43	3.22	4	3.04	-0.96
5	70	3.42	3.32	3.42	0.1
6	53	4	3.42	4	0.58
7	65	3.42	2.45	3.42	0.97
8	58	3.71	4.69	4.2	-0.49
9	35	3.81	3.32	3.61	0.29
10	20	3.2	3.42	3.52	0.1
11	66	3.91	3.91	4.49	0.58
12	69	3.42	3.81	3.7	-0.11
13	73	4.1	4.2	4.51	0.31
14	69	3.32	3.22	3.79	0.57
Mean	54.14	3.64	3.76	3.81	0.048
SD	17.46	0.32	0.70	0.52	0.595
P Value			0.067	0.446	0.751

Table 3. QuickDASH Scores

Patient ID	Pre-op qDASH	Post-op qDASH	Change
1	79.5	72.7	6.8
2	61.4	22.5	38.9
3	72.7	79.5	-6.8
4	75	29.5	45.5
5	65.9	50	15.9
6	81.8	42.5	39.3
7	79.5	27.3	52.2
8	86.36	45.45	40.91
9	75	70.45	4.55
10	86.36	68.18	18.18
11	68.18	47.73	20.45
12	80	22.73	57.27
13	81.81	45.45	36.36
14	77.5	31.81	45.69
Mean	76.50	46.84	29.66
SD	7.39	19.34	19.64
P Value			<0.001