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Objective evidence that nerve decompression protects against foot ulceration and reulceration in diabetic polyneuropathy

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Introduction: Decompression of nerve at multiple fibro-osseous entrapment sites in the lower extremity of patients with diabetic sensorimotor polyneuropathy(DSPN) and subjective pain has been used for two decades with >80% success. It has been previously dismissed as a likely placebo and bias effect. But reports of objective benefits on occurrence of serious DSPN complications like balance, elevated perineural tissue pressure, nerve conduction velocity, muscle evoked potential, diabetic foot ulcer(DFU), reulceration, and amputation refute those critiques and urge a re-examination of the approach. This paper presents the 5 year long term ulcer recurrence results of a cohort of 75 legs with prior DFU and also compares prospectively the operated and contralateral leg ulceration risk of the 42 cases who had intact contralateral legs to compare with their unilateral ulcer and nerve decompression(ND) limb.

Methods: Sixty-five DSPN cases with 1 or more healed DFUs in 75 limbs had ND of posterior tibial, common peroneal, and deep peroneal nerves at entrapment sites an average of 2.5 years after ulcer healing. All had numbness, extremity pain and a Tinel sign at an entrapment site. Limb healing status was determined at 5 years post-ND. For the 42 unilateral surgery cases primarily intact and with no subsequent intervention of revascularization or ND, the behavior of ND limbs was compared to the non-operated, intact contralateral leg for ulceration risk.

Results: After 5 years reulceration risk for the operated limbs was 2.3%/year, representing a 90% reduction from risk reported in the literature. The prospective relative risk for non-operated control limbs from year 2 through year 5 was 5.5X that of the ND limbs. P = 0.048

Conclusions: These retrospective and prospective analyses indicate strong protection against ulceration and re-ulceration is provided for DSPN cases with pain and a prior DFU with multiple ND by external neurolysis at entrapment sites. This objective result is consistent with the multiple reports of subjective improvement in pain and sensibility as examined by the recent meta-analysis of Baltodano et al. Other objective outcome studies of ulceration prevention, balance recovery, diminutions of elevated perineural tissue pressures, nerve conduction velocity normalization, hospitalization for foot infection, intra-operative EMG improvement, and lower extremity amputation rates and risk are reviewed which show similar beneficial effects. The ND procedure, though still lacking reports of prospective, randomized control trials, has growing evidence of usefulness and deserves our consideration for the baleful complications of DSPN.

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