**Nabhan A, Steudel W I, et al. Subcutaneous local anesthesia versus intravenous regional anesthesia for endoscopic carpal tunnel release: a randomized controlled trial. J Neurosurg. 2011;114(1);240-4.**

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Design: randomized clinical trial

Purpose of study: to compare the effectiveness of local anesthesia (LA) versus IV regional anesthesia (IVRA) in patients undergoing endoscopic carpal tunnel release

Population/sample size/setting:

* 44 patients (18 men, 26 women, mean age 55) treated for CTS at a university-affiliated neurosurgery department in Homburg, Germany
* Eligibility criteria were age 18-70 with at least 3 months of pain and paresthesias and numbness in the first three or all fingers and with distal median nerve distal motor latency >4.5 ms
* Exclusion criteria were prior wrist surgery, allergy to procaine, wrist bone deformity, pregnancy, or coagulopathy

Interventions:

* All patients underwent endoscopic carpal tunnel release using continuous electrocardiography, noninvasive blood pressure monitoring, and pulse oximetry
* Randomization was to one of two forms of anesthesia: LA (n=22) or IVRA (n=22)
	+ LA involved injection of 20 ml of 1% prilocaine with a 22-gauge needle in the palmar proximal wrist, compressing the infiltration site with gauze to promote distribution of the local anesthetic
		- To minimize tourniquet time, the arm was exsanguinated with a sterile elastic bandage
	+ IVRA involved a double tourniquet on the upper arm, after which the arm was exsanguinated by being elevated and wrapped with an Esmarch bandage; the proximal cuff was inflated, the Esmarch bandage removed, and 30 ml of 1% prilocaine was infiltrated into the dorsum of the hand through a 20-gauge cannula to keep the medication in the hand

Outcomes:

* Groups were compared with respect to intraoperative pain, mean tourniquet time, mean operating time, and the Michigan Hand Outcomes Questionnaire (MHQ) for overall hand function, activities of daily living, work performance, pain, aesthetics, and satisfaction with hand function
* The only outcomes on which there were group differences were mean tourniquet inflation time (13.00 minutes for LA vs 27.5 min for IVRA) and mean operating room time (28 minutes for LA vs 45 min for IVRA); other scores, such as intraoperative pain and the MHQ outcomes, did not differ between groups
* In the LA group, 1 patient had mild pain on insertion of the endoscope and required an additional local infusion of prilocaine; 3 patients in the IVRA required additional prilocaine which was dine as a local anesthetic injection
	+ 1 patient in the IVRA group required propofol for tourniquet pain
* The LA group did not experience injection-associated problems such as increased thickness of the synovial layer or decreased endoscopic view, and no instances of tendon injury of hematoma were seen

Authors’ conclusions:

* Subcutaneous LA was more effective than IVRA for endoscopic CTS release, and was simpler and less invasive to perform in patients whose operation is of short duration
* LA was not associated with complications or injury to the tendon or nerve

Comments:

* One of the inclusion criteria was “hand or wrist pain w/ paresthesias or numbness in the 1st 3 or all fingers;” if numbness in all fingers could qualify a patient for entry into the trial, then some patients could be enrolled who have ulnar nerve involvement, and could have diagnoses other than CTS; this probably did not occur often, but that is somewhat unclear
* One of the patients in the IVRA group was excluded from the trial after randomization because of venous stasis which occurred after inflation of the tourniquet; this case should not be excluded for that reason, but the exclusion does not undermine the study conclusions
* Presumably the LA group received 1% prilocaine as did the IVRA group; the methods section simply states that the LA group received 20 ml of prilocaine
* The results can be clearly interpreted as applicable to endoscopic carpal tunnel release; the application to open carpal tunnel release should be a matter for surgeon consensus to decide

Assessment: adequate for some evidence that in patients undergoing endoscopic carpal tunnel release, local anesthesia controls intraoperative pain as effectively as intravenous regional anesthesia, and may be simpler and less invasive to perform, with shorter tourniquet inflation and operating room times than IVRA