Pain a factor in forearm disability

Elderly patients with carpal tunnel syndrome (CTS) who have pain and demonstrate severe conduction velocity readings before surgery are at higher risk of incurring painful reinnervation paresthesias postoperatively. These were the results of a study presented at the 2010 annual meeting of the American Society for Surgery of the Hand by Michael Y. Elder, MD, PhD, of the Academic Medical Center in Amsterdam.

The researchers evaluated 71 patients an average of 21 years after injury. At the time of injury, most of the 33 patients who were skeletally immature were treated conservatively, with closed reduction and cast immobilization. Most of the 36 patients who were skeletally mature at injury were treated with plate-and-screw fixation. Most patients (46) had simple (type A) fractures; 7 patients had comminuted (type C) fractures and 18 patients had type B fractures, including wedge fragment.

At an average 21 years after injury, the average Disabilities of the Arm, Shoulder and Hand (DASH) score for all patients was 8 points (range: 0 to 54); 72 percent of patients reported no pain. The average rotation and wrist flexion/extension on the injured side were 91 percent of the uninjured side, and average grip strength was 94 percent of the uninjured side. The researchers noted small but significant differences in rotation and wrist flexion/extension between skeletally mature and immature patients, but found no significant differences in disability between the two groups.

The research team found that the best predictors of DASH score were worry about pain, pain, and grip strength, which accounted for 35 percent of the variation in DASH scores. Pain by itself accounted for 40 percent of the variation.

Other members of the research team for “Long-term Outcomes of Fractures of Both Bones of the Forearm” included Job N. Doornberg, MD, PhD; Anneliek L.C. Lindenbovius, MD, PhD; David C. Ring, MD, PhD; J. Carel Goslings, MD, PhD; and C. Niek van Dijk, MD, PhD.

Disclosure information: Mr. Bot, Drs. Doornberg, Lindenbovius, and Goslings—no conflicts; Dr. van Dijk—Boehringer Ingelheim, GlaxoSmithKline, Stryker.

Study tracks factors for CTS complications in elderly

Elderly patients with carpal tunnel syndrome (CTS) who have pain and demonstrate severe conduction velocity readings before surgery are at higher risk of incurring painful reinnervation paresthesias postoperatively. These were the results of a study presented at the 2010 annual meeting of the American Society for Surgery of the Hand by Michael Y. Papaloizos, MD, of the Center for Hand Surgery and Therapy in Geneva, Switzerland.

A small but significant percentage of elderly patients develop paresthesias, with potentially long-lasting neuralgia, Dr. Papaloizos noted. Data about the influence of age on patient outcome after CTS surgical release are inconsistent. Another topic of debate is the significance of severe electrophysiologic disturbances. The combination of advanced age, preoperative neuralgic symptoms, and severe conduction disturbance has been characterized as the “bad triad.” “We know that patients with preoperative reduced sensory amplitude recover more slowly than patients with reduced nerve conduction velocity only. But which of the electroneuromyographic parameters—or at which threshold—are of predictive value is still unclear,” Dr. Papaloizos said.

His retrospective cohort study sought to better define electrophysiologic parameters associated with poor outcome after surgical release in this subset of patients and, specifically, to relate the postoperative onset of painful reinnervation symptoms to characteristics of preoperative nerve conduction values.

The authors identified 276 patients older than 75 years (329 hands) who received CTS release with an open technique at a single institution during a 10-year period. Clinical nerve conduction variables—sensory conduction velocity (SCV), amplitude of sensory action potential (SAP), and motor terminal latency (MTL)—were recorded preoperatively. More than 90 percent of the hands (307) exhibited paresthesias and 34 percent (111) had neurogenic pain.

After surgery, paresthesias disappeared within the first 4 days in 246 hands (75 percent) and later than 4 days in 61 additional hands (18 percent). In 22 hands (7 percent), the patient experienced reinnervation paresthesias that lasted an average of 4.1 months. True neurogenic pain was associated with reinnervation paresthesias in 13 of these instances.

Factors from the medical history—such as diabetes, hypothyroidism, and wrist fracture—were not found to be associated with outcome. However, an association was found with age, sex, preoperative pain, and wasting of thenar muscles (Table 1). Of the electrodiagnostic parameters, SCV and MTL were significantly associated with the outcome (p = 0.03). Subsequent multivariate logistic analysis demonstrated that SCV was the strongest predictor of reinnervation paresthesias.

Although the study had several limitations, the authors concluded that surgeons treating a patient older than 75 years with preoperative pain and SCV greater than 15 m/s should inform the patient of the implications and balance the benefits of surgery with the risks.

Disclosure information: Mr. Bot, Drs. Doornberg, Lindenbovius, and Goslings—no conflicts; Dr. van Dijk—Boehringer Ingelheim, GlaxoSmithKline, Stryker.

Table 1: Factors associated with reinnervation paresthesias

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative pain</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Wasting of thenar muscles</td>
<td>0.12</td>
</tr>
<tr>
<td>Age</td>
<td>0.007</td>
</tr>
<tr>
<td>SCV ≤ 15 m/s</td>
<td>0.03</td>
</tr>
<tr>
<td>MTL ≥ 7.3 m/s</td>
<td>0.03</td>
</tr>
<tr>
<td>Male sex</td>
<td>0.09</td>
</tr>
<tr>
<td>Diabetes</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Patients older than age 75 who have preoperative pain and sensitive conduction velocity <15 m/s are at risk of painful reinnervation paresthesias. Surgeons should provide this information to patients and balance the benefits of surgery with the risks.

**Bottom Line**

- Both skeletally mature and skeletally immature patients who sustain fore- arm fractures regain most of their motion and grip strength, regardless of whether they are treated surgically or nonsurgically.
- This small, retrospective study found that disability correlated with pain and worry about pain rather than motion.

Dr. Papaloizos’s coauthors for “Electrodiagnostic Predictors of Postoperative Neuralgia after Surgical Release for Severe Carpal Tunnel Syndrome in Elderly Patients” are Nicolas Dinand, MD, and Christiane Ruffieux, MD, PhD. The authors report no conflicts.

The AAOS clinical practice guidelines on the diagnosis and treatment of carpal tunnel syndrome can be found at www.aaos.org/guidelines

American Society for Surgery of the Hand 2010 Annual Meeting