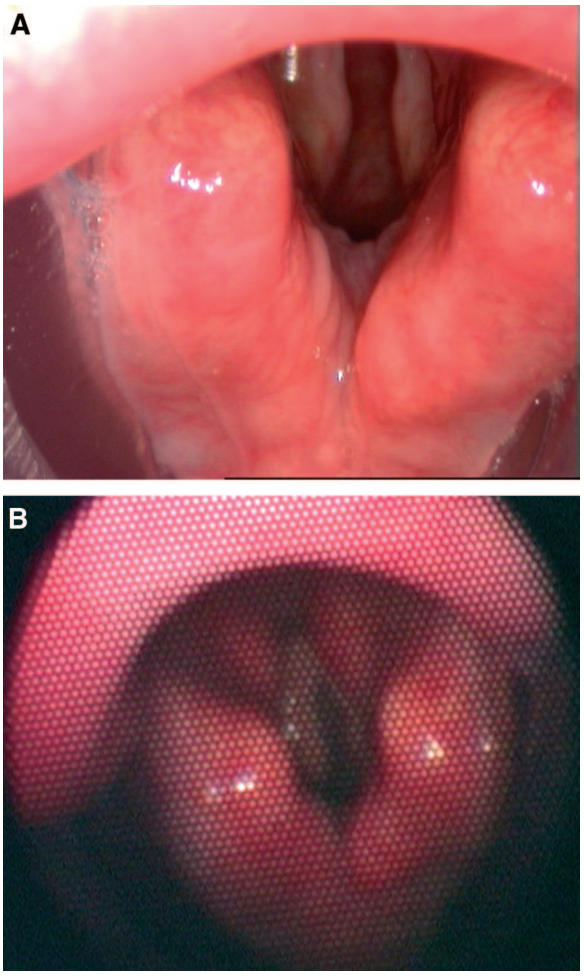

Fig. 1. View of larynx in the same patient taken with (*A*) a rigid endoscope (see text) and (*B*) a new flexible fiberoptic scope (Portaview tracheal intubation fiberscope; Olympus, Zoeterwoude, The Netherlands), using the same light source and same capture resolution (728 × 538 pixels).

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Effect of Transarterial Axillary Block *versus* General Anesthesia on Paresthesiae 1 Year after Hand Surgery

To the Editor:—Regional anesthesia (RA) is often implicated as a cause of postoperative neurologic symptoms after upper extremity surgery.[1,2] To date, there are no prospective randomized investigations of long-term postoperative neuropathy in patients receiving RA compared with general anesthesia (GA) for upper extremity surgery. In August 2004, we published a randomized trial that compared RA to GA for ambulatory hand surgery.[3] We found that there was no difference in the incidence of reported paresthesiae up to 2 weeks postoperatively among the 50 patients randomly assigned to RA (axillary brachial plexus block [AXB]) *versus* the 50 patients randomly assigned to GA. It is recognized, however, that the onset of paresthesiae after AXB may be delayed for weeks postoperatively.[4,5] We therefore prospectively followed up the 100 participants of our previously published trial[3] in an attempt to determine whether RA compared with GA affects the incidence of paresthesiae up to 12 months after ambulatory hand surgery.

After institutional review board approval and informed consent, 100 patients undergoing ambulatory hand surgery were randomly allocated to RA (n = 50) or GA (n = 50).[3] RA comprised transarterial AXB using 10 mg/kg lidocaine, 1.5%, with 1:200,000 epinephrine injected incrementally posterior to the artery, and a standard balanced protocol was administered for GA. A tourniquet was applied to the operative arm for all patients and inflated to 100 mmHg above the systolic blood pressure (minimum 200 mmHg).[3] At the time of discharge from hospital, patients were given a home diary to complete and return by mail. Among various other outcome measures,[3] patients were instructed to document the incidence of paresthesiae (numbness or tingling)[6] in the operative extremity on postoperative days 1, 7, and 14. Telephone calls were placed to all patients at 3 and 12 months postoperatively, at

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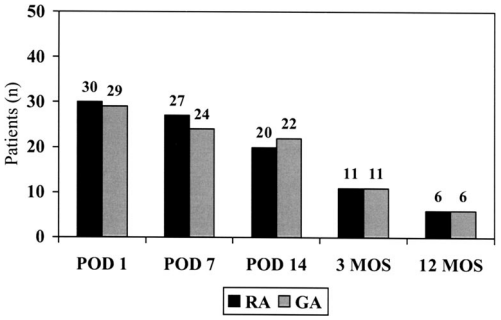

Fig. 1. Incidence of postoperative paresthesiae following regional *versus* general anesthesia for ambulatory hand surgery. GA = general anesthesia; MOS = months; POD = postoperative day; RA = regional anesthesia (transarterial axillary brachial plexus block).

which time patients were asked to report whether they experienced paresthesiae in the operative extremity. For patients who reported paresthesiae at 12 months postoperatively, we reviewed the preoperative surgical consultation found in each patient's medical chart for evidence of preoperative paresthesiae.

Results of our primary and short-term (up to 2 weeks) secondary outcome measures were published previously.[3] A total of 3 patients were lost to follow-up in the current study: 50 (100%) RA and 48 (96%) GA patients were successfully contacted by telephone at 3 months postoperatively, whereas 50 (100%) RA and 47 (94%) GA patients were successfully contacted by telephone at 12 months postoperatively. All contacted patients agreed to participate in the current study. The incidences of reported paresthesiae in the operative extremity were similar between groups at each measured time interval postoperatively (fig. 1) and nearly indistinguishable between the two groups at 3 months (11 RA patients, 11 GA patients; $P = 0.358$) and 12 months (6 RA patients, 6 GA patients; $P = 0.212$) after surgery. For all patients in aggregate, the incidence of paresthesiae in the operative extremity at 12 months postoperatively was not related to age ($P = 0.493$), sex ($P = 0.381$), surgeon ($P = 0.160$), type of hand surgery performed ($P = 0.563$), tourniquet inflation pressure ($P = 0.596$), or duration of tourniquet inflation ($P = 0.188$). However, patients who reported paresthesiae at 12 months postoperatively weighed significantly less at the time of surgery than those who had no paresthesiae at 12 months (67.1 ± 14.8 *vs.* 78.5 ± 16.2 kg; $P = 0.023$). For RA patients, the incidence of paresthesiae at 12 months postoperatively was not statistically associated with the amount of needle–skin punctures ($P = 0.804$), duration of needle–skin penetration ($P = 0.274$), or occurrence of incidental transient paresthesiae ($P = 0.339$) during AXB administration. Finally, among the 6 patients in the RA group and the 6 patients in the GA group who reported paresthesiae at 12 months postoperatively, there was no difference between groups in the number of patients who had preoperative paresthesiae (3 RA patients, 2 GA patients; $P = 0.558$) as documented in their preoperative surgical consultations.

Our results suggest that neurologic symptoms are common after either RA or GA for ambulatory hand surgery, such that all potential patient-, surgical-, and anesthetic-related causes of paresthesiae should be explored before apportioning blame to RA. Indeed, Horlocker *et al.*[7] determined that only 7 (11%) of the 62 nerve injuries that followed 1,614 AXBs were related to the block itself. Although our data reveal little about the cause of neurologic symptoms, there exists an association between decreased body mass and postoperative paresthesiae at 12 months. It is arguable that increased body mass may be protective and/or the tourniquet inflation pressure was set too high for leaner patients.

One important limitation of our study is that we did not examine for paresthesiae preoperatively. Our randomized study design nonetheless limits the introduction of bias from preexisting neuropathy. A second limitation is that we cannot exclude a type II error from our current findings. Our sample of 100 patients (50 per group) stemmed directly from our previously published trial,[3] in which we had defined our primary outcome measure as pain intensity on postoperative day 14. In the current study, we found that 6% and 8% of patients in the RA and GA groups, respectively, reported new-onset paresthesiae at 12 months postoperatively relative to their preoperative surgical consultations. *Post hoc* power analysis using these findings reveals that we would require 5,108 patients (2,554 per group) to detect a 2% greater incidence of new-onset paresthesiae at 12 months postoperatively in the GA group compared with the RA group, with 5% significance and 80% power. Nonetheless, we believe that our current findings are, however underpowered, useful and worthy of dissemination.

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