CORRESPONDENCE

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Syringe Cap Prevents Leaks during One-lung Ventilation

To the Editor.—As a major lung transplant center, we use a variety of techniques to provide isolation and ventilation of specific lungs during anesthesia and surgery. The use of specialized endotracheal tubes (Bronchocath, Univent) or bronchial blockers, coupled with fiberoptic bronchoscopic techniques, has improved our ability to safely provide one-lung ventilation. In smaller adults and children, we frequently combine a standard endotracheal tube, a fiberoptic bronchoscopic adaptor (Portex), and a 6 Fr Fogarty catheter to perform endobronchial blockade. The Fogarty catheter is introduced and advanced within the lumen of the endotracheal tube. When using this combination, it is difficult to provide a reliable tight seal when the Fogarty catheter is introduced and manipulated within the bronchoscopic adaptor cap.

We discovered an excellent solution to this perplexing problem. We found that a B-D luer tip rubber cap for syringes (Becton Dickinson and Company) fits well in the orifice of the bronchoscopic plastic adaptor caps provided by the manufacturer. (The B-D luer tip rubber cap fits snugly into the orifice of the Broncocath adaptor, as well.) To construct the leak-free system, a large needle or angiocath is used to puncture the self-sealing top of the B-D luer tip rubber cap. With the aid of forceps, and without damaging the balloon, the Fogarty catheter is positioned through the B-D luer tip rubber cap (fig. 1A). The Fogarty catheter then is placed through the swivel adaptor, and catheter position is confirmed by bronchoscopy. After removal of the bronchoscope, the B-D luer tip rubber cap is positioned snugly within the bronchoscopic plastic adaptor orifice (fig. 1B). Clinically, this system works well with a standard endotracheal tube as well as with Broncocath and Univent tubes when technical problems (e.g., balloon rupture) require the addition of a bronchial blocker.

This technique is simple, inexpensive, and effective at preventing troublesome leaks when using intraluminal bronchial blockers for one-lung ventilation.

Fig. 1. (A) Fogarty catheter shown positioned through B-D luer tip cap. (B) Final position of Fogarty and B-D luer tip cap within bronchoscopic adaptor.

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Peri- or Postoperative Ulnar Neuropathy?

To the Editor.—The article by Warner et al. concerning postoperative ulnar neuropathy may have provided sufficient information and methodology to illuminate primary causative mechanisms.1 The correlation to onset occurring postoperatively and in association with prolonged hospitalization demands that the cause also must be sought outside the operating room. Although injury can be caused by

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proper intraoperative positioning, this usually is recognized, and preventive measures are implemented. Stoelting conjectures that "unavoidable events associated with anesthesia and surgery" might cause injury. Prolonged recuperation after major surgery can occur and is associated with significant changes in personal habits and levels of consciousness.

Case Report. A (age 37–39 yr, ASA physical status 1, 85 kg) underwent two major laparotomies via xiphoid-suprapubic midline incision with hospitalization of 1 week each time. Customarily, I sleep prone. Postoperatively, I found that I slept exclusively supine with my hands positioned across my lap, causing me to wake frequently with numbness and paresthesia of the fourth and fifth digits, at times bilaterally. Arousal and active motion of the hands resolved this transient problem without permanent lesions. After the third postoperative day, the skin over both olecranon was chaffed and painful (because of supine movement using the elbows), and I noticed the symptoms occurring during the day, generally while sitting in an armchair, as I was positioning my elbows on the medial epicondyle to avoid pain from the raw skin over the olecrans. I began to sleep laterally for the same reason. At home, I ingested 0.25 mg triazolam HS (instead of 25 mg diphenhydramine used in the hospital) and awoke the next day with deep pain over the left greater trochanter, as if I had bruised my hip during sleep. The next night, after the same dose of triazolam, the same pain over my right hip developed. I attribute the pain to deep pressure scores secondary to benzodiazepine central nervous system depression. Since the surgery, I cannot sleep prone and, frequently, am awakened supine with ulnar paresthesias, even while sleeping on the padded "egg crate" mattress, provided while I was "on call" in the hospital.

Discussion. Intraoperative ulnar nerve protection routinely is discontinued with placement of the gantry and throughout subsequent convalescence. The search for causative mechanisms of ulnar neuropathy during this period in previous studies has not occurred. Prolonged supine positioning alone may result in cumulative and definitive injury, because personal habits including elbow-leaning have been proposed as causative mechanisms. Clearly, my convalescence was associated with significant elbow-leaning.

Our inability to understand this process to date may be a result of examining the problem only as an anesthetic complication. Contemporary ulnar neuropathy may occur because of absent concerns for postoperative protection, compounded by frequent administration of sedatives, analgesics, or neuromuscular blocking agents. I hope Warner et al. will reexamine the available data in this new light, given their unique database.

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In Reply.—We appreciate Kempen’s interest in our study and enjoyed reading his anecdotal report. We believe that his case is not unusual and presents several patient care issues that may be associated with the development of ulnar neuropathies.

Improper anesthetic care and patient malpositioning have been implicated as causative factors in the development of ulnar neuropathies since reports by Büdinger and Garriques in the 1890s. These factors likely play an etiologic role for this problem in some surgical patients. However, other determinants may contribute to the development of postoperative ulnar neuropathies. In a series of 12 inpatients with a newly acquired ulnar neuropathy, Wadsworth and Williams determined that external compression of an ulnar nerve during surgery was contributory in only two patients. At the Mayo Clinic, a number of nonsurgical patients experience ulnar neuropathies during inpatient and outpatient treatment. We are investigating the incidence and outcomes of these neuropathies. Although our investigation is not complete, it is clear that both surgical and medical patients may experience ulnar neuropathies during or after an episode of care.

Many factors may be associated with the development of ulnar neuropathy. Although the final pathologic event usually is nerve ischemia or trauma (e.g., myelin sheath or nerve fiber disruption), etiologic mechanisms may include external nerve compression or stretch, generalized or site-specific hypoperfusion, or metabolic/genetic predisposition to neuropathy. Typically, anesthesia-related ulnar nerve injury is thought to be associated with external nerve compression or stretch caused by malpositioning. Although this implication may be true for some patients, three considerations suggest that other factors may contribute. First, we found several patient-related characteristics to be associated with these ulnar neuropathies. Second, a high incidence of contralateral ulnar nerve conduction dysfunction in patients with postoperative ulnar neuropathies suggests that many of these patients likely have abnormal ulnar nerves before their anesthetics but are asymptomatic.