

Strokes Associated With Surgery Can Be Devastating

Strokes that occur during or shortly after surgery can be devastating, resulting in longer hospital stays and increased risks of death or long-term disability. However, prompt identification and treatment of such strokes can improve neurologic outcomes, according to an article in the journal *Expert Review of Neurotherapeutics* by Loyola University Medical Center stroke specialists Sarkis Morales-Vidal, MD and Michael Schneck, MD.

The article answers commonly asked questions about the management of perioperative stroke. Risk factors for perioperative stroke include advanced age, female gender, obesity, high blood pressure, smoking, peripheral vascular disease, chronic obstructive pulmonary disease, diabetes and high cholesterol. For most surgeries, the risk of perioperative stroke is less than one percent, but the risk can be as high as five percent for surgeries for head and neck tumors and between two and 10 percent for various heart surgeries.

The most common cause of perioperative stroke is blood clots. Blood thinners can reduce the risk of strokes, but can increase the risk of bleeding. Morales and Schneck write that in managing surgery patients, physicians must balance the risk of stroke versus the risk of significant bleeding complications. Studies have found that for many surgeries, including cardiovascular procedures, the benefits of giving patients aspirin (a blood thinner) outweigh the risks of bleeding. The authors examine the evidence for several therapies to treat perioperative strokes caused by blood clots:

- Intravenous clot-busting drug (rtPA). Because of the risk of bleeding, rtPA is not indicated for patients who have undergone major surgery within the previous 14 days, but rtPA probably is safe following minor surgeries such as muscle biopsies and dental procedures.
- Delivering rtPA by catheter. In this procedure, a high concentration of the clot-busting drug is delivered by a catheter directly to the clot, but using this technique in any patient population, surgical or otherwise, "is not currently substantiated by randomized controlled trials," the authors write.
- Mechanical clot busting. Catheter systems such as MERCI, Penumbra and Solitaire, which use mechanical devices to bust clots, have been deemed safe by the Food and Drug Administration, but these systems are "untested and unproven in perioperative stroke," Morales and Schneck write.
- Ultrasound. Sonothrombolysis uses ultrasound to enhance the break-up of blood clots in the brain. "The evidence for sonothrombolysis in stroke is far from conclusive, and the perioperative population is unstudied," the authors write.
- Hemicraniectomy. Large strokes can cause life-threatening brain swelling. A

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hemicraniectomy is surgery to relieve the swelling. The surgeon temporarily removes part of the skull, allowing the swollen brain to expand beyond the confines of the skull. "In appropriate cases, hemicraniectomy has shown clear benefit, improving survival and functional outcomes," Morales and Schneck write.

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