New stent devices can limit stroke damage, says neurosurgeon

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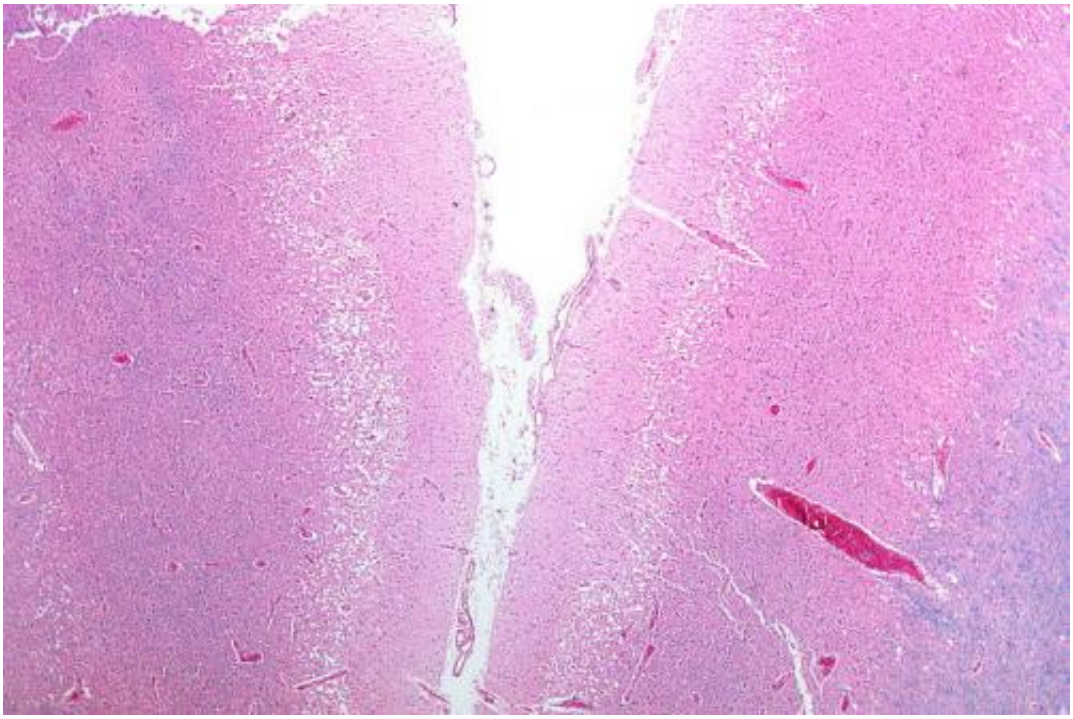

Micrograph showing cortical pseudolaminar necrosis, a finding seen in strokes on medical imaging and at autopsy. H&E-LFB stain. Credit: Nephron/Wikipedia

Elizabeth Celli was experiencing a moderate-to-severe stroke when she arrived at Loyola University Medical Center's Emergency Department.

Mrs. Celli was weak on her left side, had difficulty speaking and was unable to walk. Loyola's stroke team rapidly assessed her, ordered an

immediate CT scan and put her on the clot-busting drug tPA. The stroke team determined that Mrs. Celli qualified for a minimally invasive procedure to reverse the stroke.

Neurosurgeon Asterios Tsimpas, MD, used a catheter to deploy a device called a stent retriever. The device removed a blood clot that was blocking blood to a major part of her brain.

Before the procedure, Mrs. Celli had a score of 19 on the National Institutes of Health Stroke Scale. After the procedure, her scored dropped to 1, indicating almost no lasting effects. (The stroke scale ranges from 0 to 42, with scores of 16 to 20 indicating moderate-to-severe stroke.)

About 85 percent of strokes are ischemic, meaning they are caused by clots that block blood flow to the brain. The intravenous clot-busting drug tissue plasminogen activator (tPA) can restore blood flow, if it is given soon enough and the clot is small enough. But in many patients, tPA alone is not sufficient to restore blood flow. In such cases, mechanical devices deployed with catheters can be used to remove the clot.

The latest mechanical device is a stent retriever (also known as a stentriever). The device is a self-expanding mesh tube attached to a wire, which is guided through a catheter (thin tube). The surgeon inserts the catheter in an artery in the groin and guides it through various blood vessels up to the blood clot in the brain. The stentriever pushes the gelatinous blood clot against the wall of the blood vessel, immediately restoring blood flow. The stentriever then is used to grab the clot, which is pulled out when the surgeon removes the catheter. This technique, known as an endovascular treatment, is much less invasive than traditional open surgery, in which a portion of the skull is removed to gain access to the brain.

Stentrievers work faster and are more reliable than earlier generations of mechanical devices, said Loyola neurosurgeon William W. Ashley Jr., MD, PhD. "And devices are continually evolving and improving," Dr. Ashley said.

Four recent clinical trials have demonstrated the effectiveness of the new generation of mechanical devices. For example, results of the recent multicenter, international trial known as ESCAPE were so convincing the trial was stopped early. Stroke patients were randomly selected to receive tPA alone or tPA plus endovascular treatment with stentrievers. After 90 days, 53 percent of the endovascular group was functionally independent, compared with 29.3 percent in the group receiving tPA alone. The mortality rate was 10.4 percent in the endovascular group, compared with 19 percent in the group receiving tPA alone. The study was published in the *New England Journal of Medicine.*

Three other recent trials – SWIFT PRIME, EXTEND-IA and MR CLEAN – also demonstrated the effectiveness of the newer endovascular treatments. However, only a small percentage of stroke patients experience the type of ischemic stroke examined in the trials and also arrive at the emergency department within six hours of the onset of the stroke, when endovascular treatment is most effective.

Provided by Loyola University Health System