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Risk of blindness from spine surgery down significantly

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The risk of blindness caused by spinal fusion, one of the most common surgeries performed in the U.S., has dropped almost three-fold since the late 1990s, according to the largest study of the topic to date.

Results of the research were published online June 30, 2016 in *Anesthesiology*, the official medical journal of the American Society of Anesthesiologists.

"While there are significant complications that can result from spinal-fusion surgery, it seems that blindness, a catastrophic and devastating complication, is one that has become far rarer in recent years," says Dr. Steven Roth, the Michael Reese Endowed Professor of Anesthesiology at the University of Illinois at Chicago College of Medicine, and senior author on the paper.

Nearly 480,000 spinal fusions are performed in the U.S. each year, with an incidence of blindness placed between one-in-1,000 and one-in-10,000. Because most studies on the operation have been very small, it has been difficult to devise guidelines for patients and surgeons in decision-making.

In a spinal fusion, surgeons remove the cartilage disc between two vertebrae and permanently join the spinal bones using bone grafts and screws. It is a last-resort treatment for the pain and nerve damage from degraded discs, which may have been caused by trauma, older age, sedentary lifestyle, or obesity. Genetics plays a role, too. The disc does

not have a blood supply, so once injured, it cannot repair itself the way other tissues in the body can.

With the steep jump in numbers of people undergoing spinal fusion in the last 20 years, Roth said, spinal surgeons and anesthesiologists have become even more concerned about the risk for blindness.

"We wanted to know if rates of blindness as a result of these surgeries was stable, increasing or decreasing over time," said Roth, who is also professor of ophthalmology at UIC.

Using data from the Nationwide Impatient Sample, he and his colleagues estimated the number of spinal fusions and cases of blindness caused by the surgery between 1998 and 2012. They looked for procedure codes for spinal fusion surgery and diagnosis codes for ischemic optic neuropathy occurring during or directly after the surgery. Ischemic optic neuropathy causes blindness by damaging the optic nerve.

They estimated that 2,511,073 spinal fusions were performed, resulting in 257 instances of ischemic optic neuropathy, or 1.02 per 10,000 surgeries. But over that time-span, the risk decreased 2.7 fold, or 60 percent.

The researchers noted that significantly increased risk for ischemic optic neuropathy during spinal fusion surgery came with age over 50; male sex; receiving a blood transfusion during the procedure; and obesity.

Roth attributes the decline in risk to the increasing use of minimally invasive surgical techniques.

"The characteristics of the patients undergoing spine fusion haven't changed all that much over the years, although the population has aged," Roth said. "So the variables that must be contributing to the decline in

blindness caused by spine fusion surgery are most likely the result of changes made in how the surgery is performed."

Roth believes that changes in anesthesia practice may also be driving the decrease in risk of blindness. Many anesthesiologists now set a stricter limit for how low they will allow blood pressure to drop during surgery, he said, which may help reduce the risk for ischemic optic neuropathy.

Dr. Daniel Rubin of the University of Chicago is the first author on the paper. Isaac Parakati of the University of Chicago; Dr. Lorri Lee of Vanderbilt University; and Dr. Heather Moss and Charlotte Joslin from the department of ophthalmology and visual sciences at UIC are co-authors.

Provided by University of Illinois at Chicago