

# Innovative 'false pedicle' surgery allows for advanced spinal/pelvic reconstruction

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A multidisciplinary team at The Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital & Richard J. Solove Research Institute (OSUCCC – James) has pioneered a new surgical technique using false pedicles to create a load-bearing pelvic/spine

structure that supports and protects the spine after complex cancer surgeries.

Ehud Mendel, MD, FACS, and his colleagues detail the creation of false pedicles and a neo-pelvis for lumbopelvic reconstruction following en bloc resection of iliosacral chondrosarcoma with lumbar [spine](#) in a paper published in March 2014 issue of the *Journal of Neurosurgery:Spine*. An illustration of the surgery was also selected for the March issue's front cover.

"Primary bone tumors such as chondrosarcomas are unique in that they must be removed completely intact otherwise there the cancer is guaranteed to recur," says Mendel, a neurosurgeon and director of the Ohio State Spine Oncology Program. "This technique allows unique fixation of the spine after the tumor has been removed."

These tumors are removed fully intact (known as en bloc resection) in the hope of successfully eradicate the cancer and are especially challenging, notes Mendel, who also serves as the Justin Skestos Chair and Professor of Neurosurgery, Oncology and Orthopedics at the Ohio State College of Medicine. "They often involve supporting bones in the pelvis and lower spine that are critical for maintaining mobility and bowel and urinary continence," he says.

The term "pedicle" refers to the short extensions of bone that help form the arches on each vertebra. The vertebral arches protect the spinal cord as it runs down the spinal column. Treatment of primary bone tumors often requires removal of cancerous portions that must be replaced to provide support for the spine and pelvis.

The innovative surgical technique creates an artificial spinal support structure that combines structural supports with narrow segments of living bone attached to the spinal column. These false pedicles are

created using bone grafts from an amputated lower limb and then permanently attached to the sides of the patient's spinal vertebrae where they develop new blood vessels that promote their growth and fusion.

Surgery for primary bone tumors such as chondrosarcoma must be customized based on the patient's tumor characteristics and anatomical involvement. To guide surgery, Mendel's team builds a 3D model of the patient's spine to map how a customized support system will fit with the patient's anatomy post tumor removal. This 3D model serves as a guide for both the [spine surgery](#) and reconstruction/stabilization of the spine and pelvis after tumor removal.

"The creation of false pedicles allows us to reconstruct a patient's spine and create a functional load-bearing pelvic structure adequate for early mobilization and ambulation. This gives patients the potential to regain the ability to walk with early mobilization," adds Mendel.

The OSUCCC-James team is the first to publish on the false pedicle approach and one of only a few teams in the world performing en bloc complex surgical resections for primary bone tumors.

**More information:** "Creation of false pedicles and a neo-pelvis for lumbopelvic reconstruction following en bloc resection of an iliosacral chondrosarcoma with lumbar spine extension." Ehud Mendel, et al. *Journal of Neurosurgery: Spine*. Mar 2014 / Vol. 20 / No. 3 / Pages 327-334. [thejns.org/doi/full/10.3171/2014.3.SPINE.1211?prevSearch=false%2Bpedicle&searchHistoryKey=](http://thejns.org/doi/full/10.3171/2014.3.SPINE.1211)

Provided by Ohio State University Medical Center

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