

Vertebral Body Tethering Emerging as an Effective Treatment for Idiopathic Scoliosis

Pediatric surgeons at Cincinnati Children's performed vertebral body tethering (VBT) for the first time in January 2020, just five months after the Food and Drug Administration approved the procedure for children with idiopathic scoliosis.

Early data suggest that VBT leads to less postoperative pain and shorter recovery times compared to spinal fusion, with the potential for better long-term outcomes. Cincinnati Children's is one of only a few pediatric institutions to offer this technically demanding procedure, which requires extensive training for practitioners.

VBT is a spinal growth modulation procedure and less invasive alternative to spinal fusion. During VBT, the spine surgeon uses screws to attach a flexible tether to the spine in the affected area. Tension is applied to the tether to straighten the spine. The spinal curve shows improvement immediately after surgery, and the curve continues to improve as the child grows and the spine adjusts to the tension on the tether.

VBT is indicated for children who are skeletally immature, have a spinal curve between 45 and 65 degrees, and have failed brace therapy. Cincinnati Children's has performed nine VBT surgeries since January 2020.

"Spinal fusion is highly effective, but not as physiologic as VBT, because it sacrifices motion and artificially introduces stresses in the un-fused portion of the spine," says Viral Jain, MD, a pediatric spine surgeon at Cincinnati Children's. "However, VBT maintains the spine in as normal a position as possible, which preserves mobility and may help patients avoid degenerative changes in nonoperative portions of the spine."

VBT uses an anterior approach that is highly uncommon in scoliosis surgery. A thoracic surgeon provides endoscopic access and visualization, and the spine surgeon implants the tether.

"We are finding new ways to refine our approach — for instance, by using a smaller instrumentation technique to overcome some of the technical challenges of getting in and out of the surgical site," Jain says.

The procedure offers several short-term benefits, including significantly less postoperative pain, less blood loss and a faster recovery compared to spinal fusion.

"Fusion patients typically need four or more weeks of physical therapy after surgery, while VBT patients might only have one or two sessions," Jain says. "After VBT, patients usually return to their normal, pre-surgery life within about two weeks."

Between 10% and 15% of scoliosis patients at Cincinnati Children's qualify for VBT. If a patient has reached skeletal maturity or their spinal curve is too great, fusion is the best alternative. Jain offers less invasive spinal fusion for patients who meet the criteria and are anxious to return to sports.

Jain continues to follow VBT patients as they reach skeletal maturity and contributes data to the Pediatric Spine Study Group, a national collaborative studying VBT and other spine surgeries.

