

## Adolescent Idiopathic Scoliosis treated with posterior spinal fusion and application of nanocrystalline hydroxyapatite (NanoBone® Bone Graft)

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### Preoperative

The patient is a 15-year-old female who presented initially in 2019 to establish care for scoliosis observed at a local chiropractor during an adjustment for back pain. Radiographs initially demonstrated a moderate-sized Lenke 1A curve, measuring about 40 degrees. Due to her skeletal maturity at Sanders 7, observation of the curve took place over the next year. In June 2020 her thoracic curve had progressed to 46 degrees necessitating scheduling of a posterior T3 to L1 spinal fusion for her significant adolescent idiopathic scoliosis.



Fig. 1. Preoperative AP and lateral X-rays demonstrating significant scoliosis

### Surgical Procedure

Following informed consent, the patient underwent surgery with longitudinal posterior exposure from transverse processes to transverse process, T3 to L1 and facetectomies performed followed by Ponte osteotomies throughout the apex. The spinous process was resected at each level and harvested for autograft along with the transverse process. Uniaxial pedicle screws were placed throughout the apex and polyaxial screws at the distal end of the construct.

After screws were placed, a 6mm cobalt chrome rod was placed on the left side and differential contouring was carried out by bending an increased amount of kyphosis into the rod. The spine was reduced to the rod and set screws were placed with a 6mm titanium rod placed on the right following reduction. Direct vertebral body derotation was performed through the apex and final tightening of set screws performed with hooks resealed with compression and/or distraction.

Decortication of the spine was carried out along with bone grafting consisting of three (3) 10cc kits of NanoBone Bone Graft Substitute mixed with autograft and placed over the spine and lateral gutters. A deep Hemovac drain was placed after closure with excellent hemostasis and no neuromonitoring changes in motor or SSEP function.



**Fig. 2.** Intraoperative AP X-ray and surgical photos demonstrating stable scoliosis construct

### Postoperative

Following a 3-day inpatient hospital stay, the patient was discharged with oral medications and physical therapy. Bending, lifting, twisting restrictions were placed for 6-months to allow fusion healing. Narcotic pain medication was eliminated after the first week postop followed by 2-weeks of NSAID treatment for intermittent pain. Return to school occurred 4-weeks after surgical correction with restrictions on backpack weight and PE class.

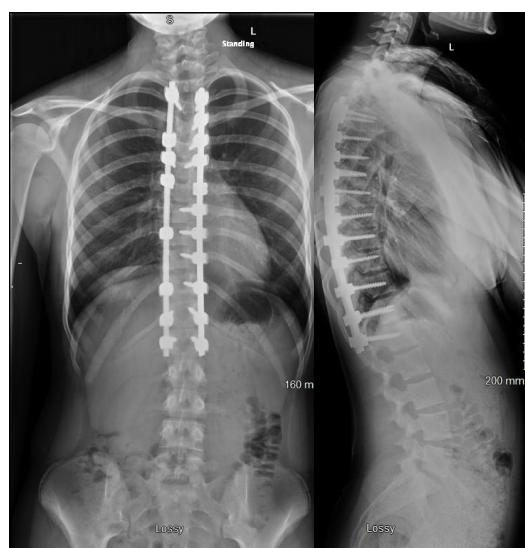
At 6-weeks postop, patient was off pain medications and following restrictions. Incision was well approximated, and radiographs demonstrated unchanged placement of hardware. At 3-months postoperative radiographs confirm a stable construct and fusion mass with the patient returning to low impact activity. At 6-months postoperative, X-rays demonstrate proper hardware placement with no acute changes and a well-healed fusion mass. The patient VAS score was 0/10 and she has returned to normal activities.



**Fig. 3.a.**  
6-weeks postoperative AP and lateral X-rays demonstrating stable hardware and unchanged placement



**Fig. 3.b.**  
3-months postoperative radiographs confirm stable construct with good fusion mass



**Fig. 3.c.**  
6-months postoperative radiographs demonstrate well-healed fusion mass