Radiculopathy and spondylolisthesis of the lumbar spine treated with posterior instrumentation and posterolateral application of nanocrystalline hydroxyapatite (NanoBone® Bone Graft)

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Preoperative

The patient was a 70-year-old male who presented with low back pain of several years duration radiating into the left leg. He was unable to walk more than fifty feet without stopping. Radiographs showed spondylolisthesis at L5-S1 with mild degenerative disc disease throughout the entire spine. An MRI showed L5-S1 with diffuse slightly left-sided disc bulge, facet disease, and mild narrowing of the spinal canal. L5-S1 showed diffuse left lateral disc protrusion pressing on the left L5 nerve root. Co-morbidities included anemia, GERD/reflux, hypertension, Stage 3 kidney disease, and osteoarthritis.

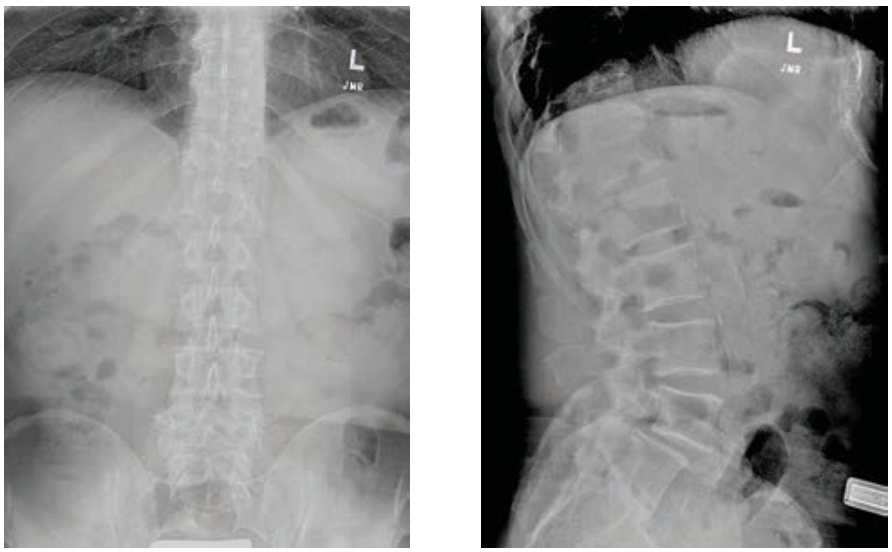

Fig. 1. Preoperative radiographs demonstrating L5-S1 spondylolisthesis

Surgical Procedure

The patient was taken to surgery and fluoroscopy used to identify the incision site. A midline L5-S1 incision was made down to the interlaminar space. There was obvious spondylolisthesis. Pedicle screws were placed at L5 and S1 using biplanar fluoroscopy. The screws had very good purchase due to very good bone quality. After screws were placed, a full midline decompressive laminectomy of L5 and S1 was performed. Bilateral facetectomies with complete medial facetectomies and extensive foraminotomies of the L5 and S1 nerve roots followed. Decompression was taken well lateral to the thecal margins on both sides. The posterolateral gutters were decorticated meticulously. A mixture of 15ml of allograft cancellous bone chips and 5ml of NanoBone QD was placed in the lateral gutters on both sides. Pre-contoured rods were placed into the pedicle screws and tightened. Excellent haemostasis was achieved and the wound was closed in layers with a deep drain in place.

Postoperative Course

Eleven days after surgery the patient presented complaining of back pain radiating down the left leg without muscle ache or weakness. He took appropriate amounts of Percocet 5/325 as needed for pain. His incision was clean and dry. He had an expected range of motion and was neurovascularly intact. He was given an intramuscular injection of Depo-Medrol and Toradol to help with pain and inflammation. Patient returned four weeks later still complaining of back pain. He was referred for physical therapy.

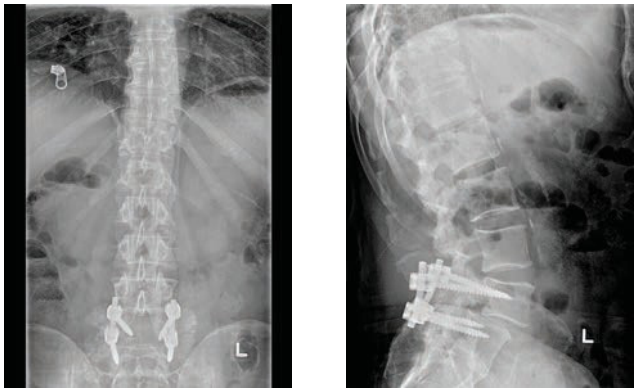

Fig. 2. 8-weeks postoperative X-rays confirming proper hardware placement

At eight weeks post-surgery, patient was doing very well and had significantly reduced his pain medication. Radiographs showed proper placement of hardware and increased radiodensity of the posterolateral fusion masses.

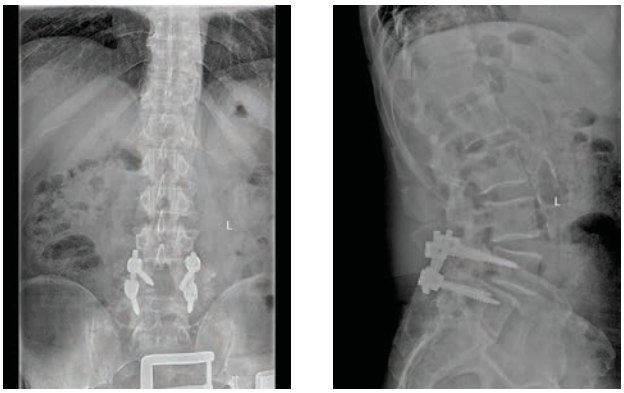

Fig. 3. 4-months postoperative X-rays confirming well-healed fusion mass

At four months post-surgery, radiographs confirmed proper placement of pedicle screws and rods with good fusion mass. The fusion appeared well-healed. He was returned to all normal daily activities and off all narcotic pain medication.

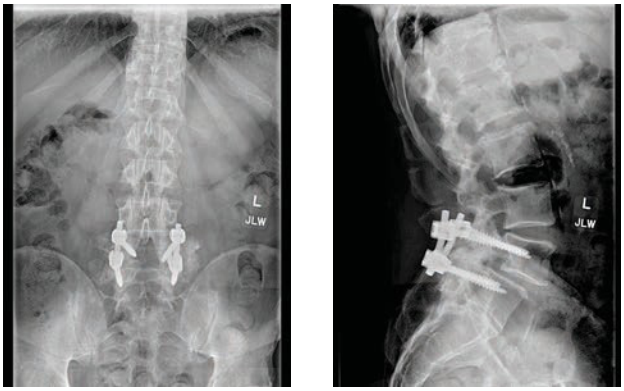

Fig. 4. 14-months postoperative X-rays confirming well-healed fusion mass

Patient returned for follow-up at about fourteen months post-op. He continued to have some sporadic back pain that is managed using Tylenol. Current pain scale was 0/10. Radiographs showed pedicle screws and rods in proper placement with no loosening. The fusion was well-healed. Bone mass was mature and abundant. Patient was advised that he may continue with normal activities as tolerated.

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