

Non-Fusion Alternative for Treating Adjacent Segment Disease



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Spine Surgery
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Scan to learn more about Dr. Gaudin

This is a 42-year-old otherwise healthy male who presented electively with progressively worsening neck pain radiating down the left arm, with paresthesia in the first three digits. He had a previous C6-7 anterior cervical discectomy and fusion (ACDF) two years prior, from which he recovered well. He was referred to Dr. Xavier Gaudin for a neurosurgical spine evaluation. An MRI cervical spine was obtained, which demonstrated C5-6 adjacent segment degenerative disease with a large disc extrusion resulting in severe left lateral recess and foraminal stenosis (Figure 1).

He had no neurologic deficits on exam, and therefore was started on a trial of multidisciplinary and multimodal conservative management. This included non-opioid pharmacologic regiment, lifestyle modification, physiotherapy, chiropractic, and epidural steroid injection. Despite these conservative measures, his symptoms remained severe and debilitating, and therefore surgical options were discussed. He underwent an uneventful C5-6 anterior artificial disc replacement. Postoperatively, his neck and radicular arm pain had fully resolved. Imaging demonstrated maintained physiologic flexion and extension of the cervical spine (Figure 2). **This motion-preserving surgery reduces the adjacent degeneration process, and the need for further surgeries down the line.**

Artificial cervical disc replacement, also known as total disc replacement or arthroplasty, allows for preservation of spinal range of motions. This non-fusion alternative reduces the biomechanical stress on the adjacent segments of the spine, which decreases the rate of physiologic degeneration cascade. The prevalence of adjacent segment degeneration after a spinal fusion is about 15%. In addition, artificial disc replacement does not require postoperative collar immobilization, thereby allowing for the patient to return to work and their usual activities sooner than a fusion. It may also be a better option for patients who are at risk of fusion failure (i.e. pseudoarthrosis), such as diabetics and nicotine users. While the current FDA guidelines and indications for artificial cervical disc replacement are limited, there are several off-label uses that are well supported in the literature. Under the care of a complex spine professional, artificial disc replacement can be utilized to treat adjacent segment disease, multilevel disease (greater than 2 segments), pseudoarthrosis, and even reversal of previous spinal fusion.



FIGURE 1:

Preoperative MRI demonstrating C5-6 disc herniation with stenosis, adjacent to the previous C6-7 ACDF

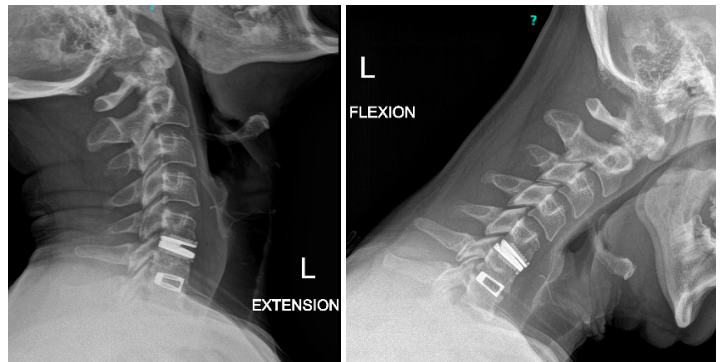


FIGURE 2:

Postoperative dynamic x-rays; note the differences in range of motions between the artificial disc at C5-6 and the previous fusion at C6-7.

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Cervical Laminectomy and Fusion



WILLIAM SONSTEIN M.D., F.A.C.S.
Spine Surgery



Scan to learn more about Dr. Sonstein

CLINICAL PRESENTATION:

The patient is a 66-year-old female who presented with 2 months of progressive difficulty ambulating and using her hands. On examination, she was noted to have long track weakness.

The patient had a prior history of C4-C7 anterior cervical discectomy and fusion. She subsequently developed a listhesis of C7-T1 necessitating a posterior laminectomy and fusion from C3-T2.

CLINICAL MANAGEMENT AND TREATMENT:

An MRI of the cervical spine demonstrated severe stenosis at C2-3 with cord compression secondary to significantly thickened posterior ligament and facet arthropathy (Figure 1).

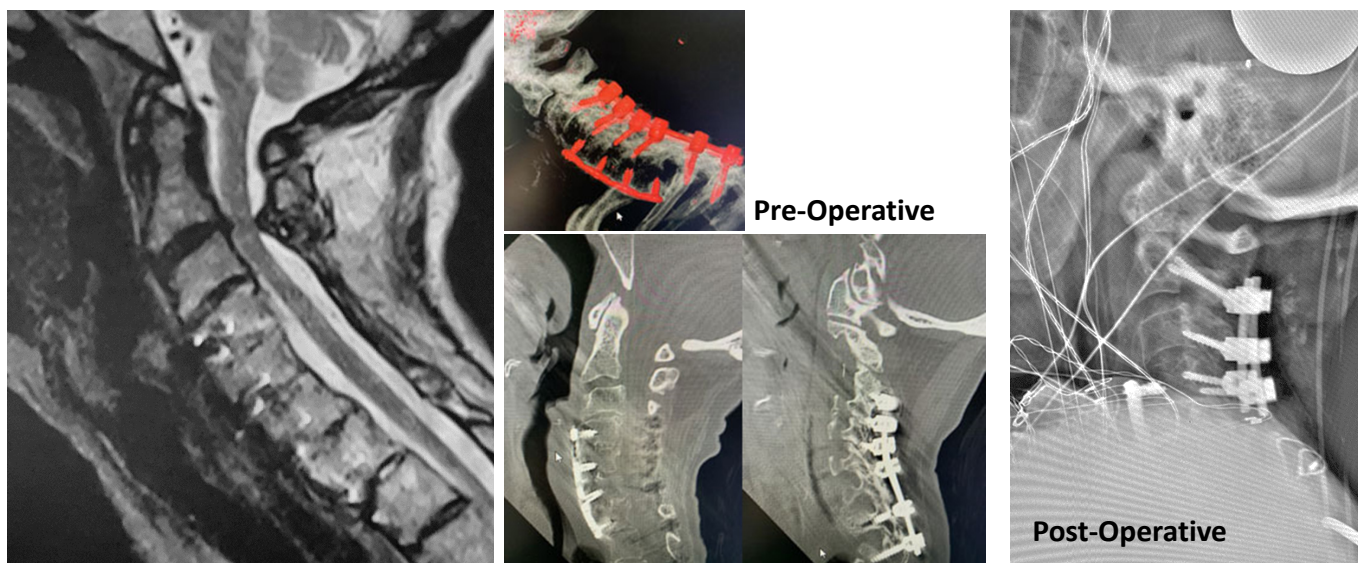


FIGURE 1:

Sagittal T2-weighted MRI of the cervical spine demonstrates severe spinal cord compression at C2-3. Prior instrumented decompression and fusion of C4-7 is shown.

FIGURE 2:

Pre-operative sagittal CT scans of the cervical spine demonstrating prior instrumentation (note degenerative changes and anterolisthesis of C2 and C3). Postoperative lateral cervical spine x-ray showing removal of prior long posterior construct with final short segment fusion of C2-4; note addition of bilateral C2 pars screws.

The patient underwent posterior cervical laminectomy C1-3 to decompress the spinal cord and instrumented fusion of C2-4. On exploration, the patient was deemed to be fused and the previous hardware was removed except for the lateral mass screws at C3 and C4 that were left in (Figure 2). Postoperatively the patient had an uneventful course with some improvement in finger extensor strength.

Former NCAA Quarterback is Back to Normal After Elective Fusion



DANIEL BIRK M.D.
Spine Surgery



Scan to learn more about Dr. Birk

This is a 45-year-old IT professional who is married and has two children. He's a former NCAA college football quarterback.

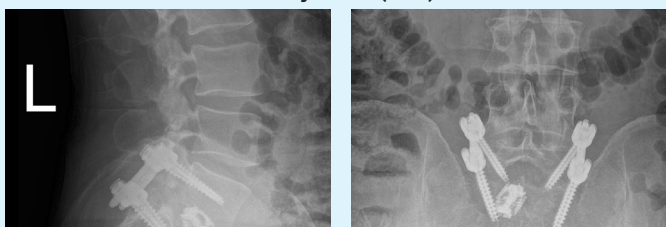
Since a car accident in 2015, he suffered chronic, intermittent episodes of back pain. He was in chiropractic treatment when he developed sudden, severe leg pain while jogging in California.

Dr. Birk performed a minimally invasive transforaminal lumbar interbody fusion (TLIF). After the procedure, no narcotic use was needed, and his back and leg pain were gone. The patient returned to normal functioning.

Preop x-rays showing pars defects or spondylolysis of the lumbar spine.



Postoperative x-rays of the completed transforaminal lumbar interbody fusion (TLIF)



URGENT

Neurosurgical Intervention Reverses Central Cord Syndrome



YUSEF IMANI M.D.
Spine Surgery



Scan to learn more about Dr. Imani

JP is a 65 year old man who presented to the ER after a fall from a horse. He was unable to move his arms, but had some minimal movement in his legs. He had suffered a spinal cord injury affecting the cervical spinal cord and needed neurosurgical consultation.

This patient was suffering from compression of the cervical spinal cord. The fall cause an acute herniation of the cervical disc, which caused pressure on the spinal cord. {Image 1 Sagittal and axial T2 MRI} This particular spinal cord injury is called Central Cord Syndrome. This type of spinal cord injury typically affects the hands more than the legs and requires urgent surgical attention.

Dr. Imani performed an Anterior Cervical Discectomy and Fusion to remove the pressure of the herniated disc from compressing the spinal cord and stabilizing the spinal column with a fusion of the C3/C4 disc space. {Image 2 Lateral and AP cervical spine x-ray}

After Dr. Imani's surgery, the patient is making a full recovery. He is able to walk and move both arms/hands.

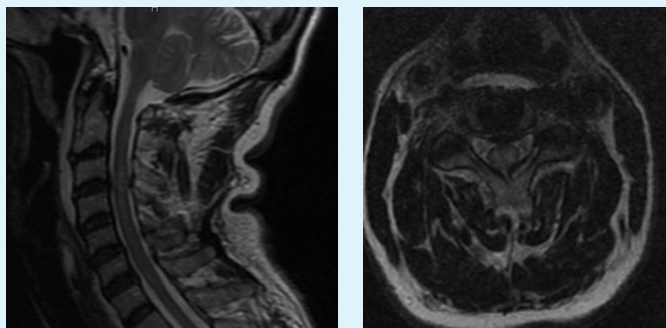


Image 1 – T2 MRI sagittal and axial showing C3/C4 disc herniation with compression of the spinal cord; spinal cord edema at the C3/C4 level

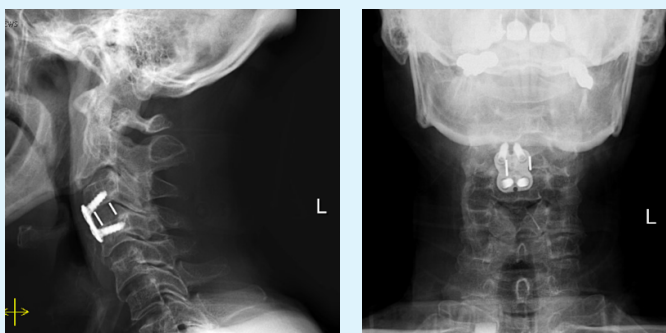


Image 2 – Lateral and AP cervical spine x-rays s/p ACDF

References

1. Dahdaleh NS, Lawton CD, et al. Evidence-based management of central cord syndrome. Journal of Neurosurgery, 2013: 35(1).



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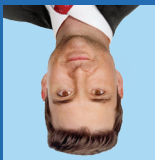
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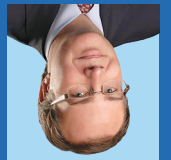
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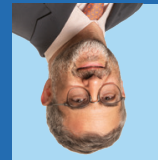
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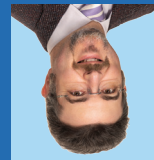
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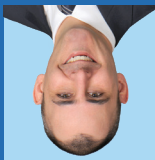
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