

Patient Experience with ViviGen® Cellular Bone Matrix in a Stand-Alone Multilevel Anterior Cervical Discectomy and Fusion with Revision

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Introduction

60 year-old extremely delightful female patient care coordinator with a medical history of fibromuscular dysplasia, asthma, bronchiectasis and a surgical history of a clipped cranial aneurysm presented to our clinic with complaints of 3 months of progressive upper extremity weakness and numbness as well as gait instability. On neurological examination the patient had right triceps weakness (3/5) and right finger intrinsic muscle weakness (4/5). The exam revealed severe myelopathy with unsteady gait, bilateral clonus and positive Babinski reflexes. An MRI of the cervical spine was obtained. The imaging study revealed degenerative changes with severe cervical spinal stenosis from C4 – C7 with extensive increase of T2-signal intensity at the area of maximum stenosis (Figure 1). The patient also underwent an EMG/Nerve conduction study, which revealed large amplitude motor unit action potentials in the right triceps brachii and pronator teres consistent with right C7 radiculopathy. Given the severity of symptoms and the rapid progression of symptoms no further conservative treatment modalities were considered.

Figure 1

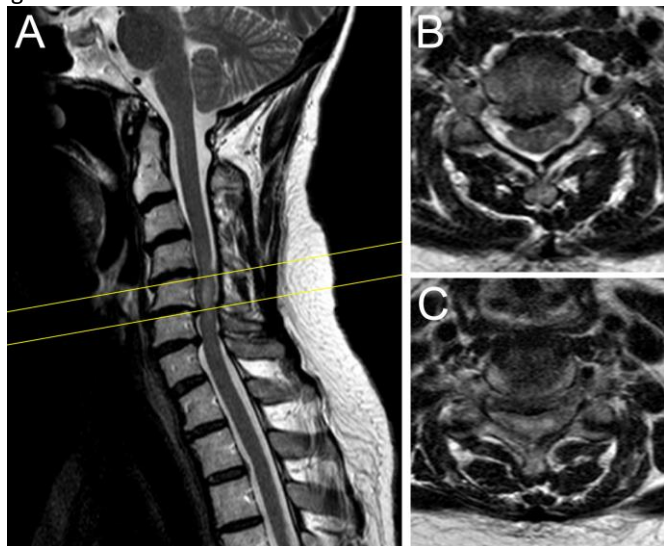


Figure 1. Preoperative sagittal T2 weighted MRI depicts severe spinal stenosis from C4-C6 with T2 hyperintense spinal cord signal (A). Axial T2-weighted images reveal moderate C4/5 (B) and severe C5/6 (C) spinal stenosis.

First surgical procedure

The patient underwent a C4-C7 anterior cervical discectomy and fusion (ACDF). Given the extensive osteophytes the patient required partial corpectomies of C5 and C6 in order to adequately decompress the spinal cord. VERTIGRAFT® (VG1®) Cervical Allograft cages filled with ViviGen Cellular Bone Matrix was used as interbody grafts. The construct was stabilized with a SKYLINE® Anterior Cervical Plate spanning from C4-C7. The patient tolerated the procedure well and was discharged home on postoperative day #2.

Revision surgical procedure

The patient recuperated well and both myelopathy and right C7 radiculopathy resolved postoperatively. The patient's neurological exam normalized. The patient suffered from a partial right rotator cuff tear 10 days after surgery which resolved with physical therapy. The patient returned to work. However, 5 months after surgery the patient developed right arm pain with radiation into her right shoulder and forearm. The patient developed recurrent right triceps weakness. A repeat EMG was consistent with right C7 radiculopathy. A CT of the c-spine revealed radiographic arthrodesis of the C4-7 3-level arthrodesis construct. However, subsidence had occurred at C6/7 and caused C6/7 foraminal stenosis (Figure 2). Foraminal stenosis was confirmed on an MRI. The patient underwent an endoscopic right C6/7 foraminotomy. For circumferential arthrodesis, the C6/7 facet joint was exenterated and filled with ViviGen for an in situ fusion of the facet joint.

Figure 2

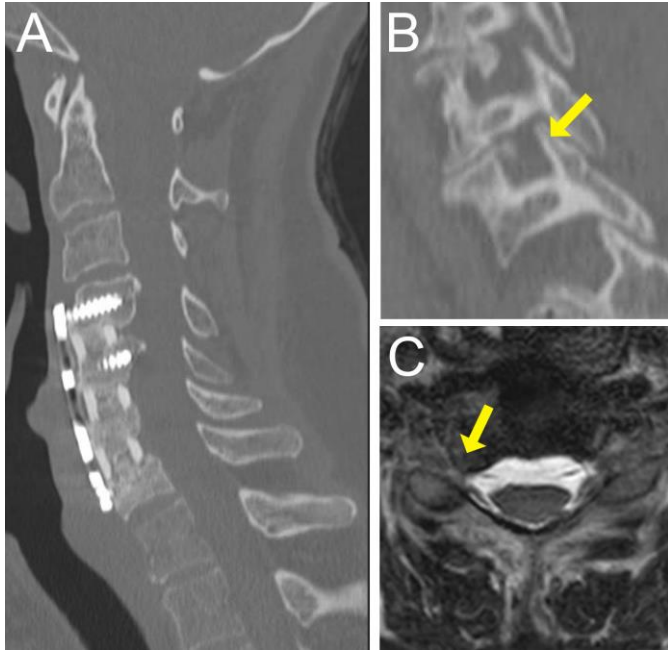


Figure 2. A sagittal CT scan of the cervical spine reveals radiographic fusion of the C4-7 arthrodesis construct (A). The CT scan suggests subsidence at C6/7 with right foraminal stenosis (B). An axial T2-weighted MRI reveals right C6/7 foraminal stenosis (C).

Clinical Outcome

The patient is currently 16 months after her initial surgery. A one-year follow-up CT scan confirmed successful fusion of the posterior elements by the ViviGen onlay graft. Her symptoms have resolved and she is back at work.

Figure 3

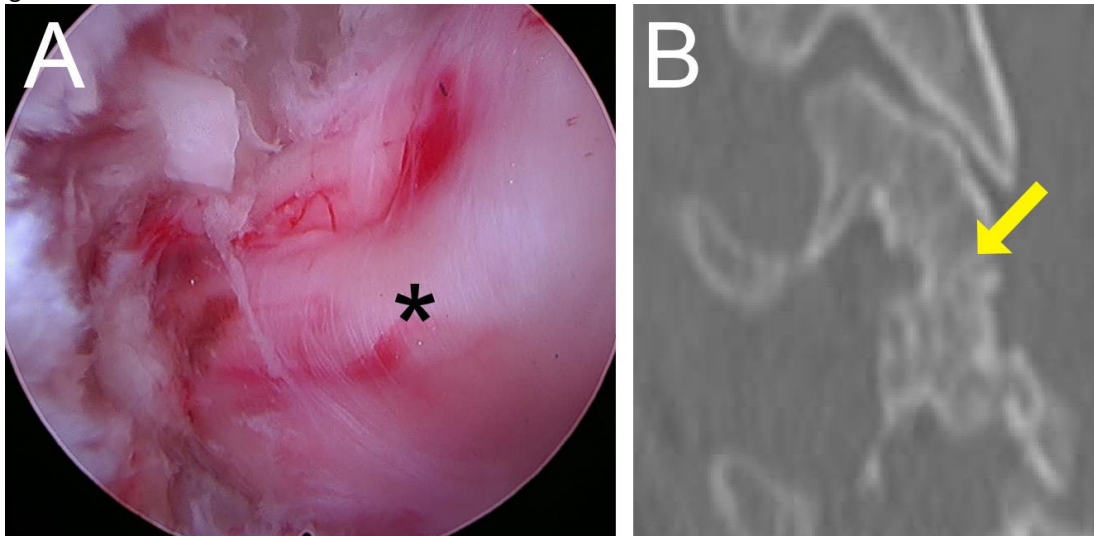


Figure 3. Intraoperative view depicting a decompressed C7 nerve root by an endoscopic C6/7 foraminotomy. Note the demarcation of the dorsal and ventral root (A). A CT scan reveals successful arthrodesis of the C6/7 onlay fusion using ViviGen.

ViviGen Cellular Bone Matrix

ViviGen comprises cryopreserved live, viable bone cells within a corticocancellous bone matrix and demineralized bone. ViviGen is processed from donated human tissue and is intended for repair, replacement, or reconstruction of musculoskeletal defects. ViviGen contains viable cells that are committed to produce bone in concert with the osteoconductive scaffold and osteoinductive signals naturally found within the demineralized bone¹.

¹ Data on file LifeNet Health: DHF 12-008

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