Spinal Fusion Case Review

Kore Fiber® Evaluation in Multilevel Lumbar Fusion

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Case Highlights

- A 61-year-old male with acute lower back pain
- Lumbar spinal stenosis with neurogenic claudication
- Kore Fiber in instrumented Extreme Lateral Interbody Fusion (XLIF) L1-2, L2-3, L3-L4, L4-L5 and laminectomy L1-L5
- 3-month follow-up showed successful posterior instrumented interbody fusion between L1 and L5 and significant pain relief

Clinical Presentation

A 61-year-old healthy male man presented with chronic low back pain without a precipitating event after failing conservative treatment with his pain management team. Magnetic resonance imaging showed moderate lumbar levoscoliosis, lumbar spondylosis, severe disc degeneration in lumbar (L) levels 1-2 through L3-L4 with multilevel moderate disc and facet degeneration. There was also multilevel lateral recess effacement with evidence of impingement of the passing right L3, bilateral L4, and left L5 nerve roots. Finally, there was severe left L4-L5 and moderate to severe left L3-L4 neural foraminal narrowing, with effacement of the exiting left L3 and L4 nerve roots. Spinal fusions are commonly performed spine surgeries effective at treating spondylolisthesis, traumatic injuries, congenital or degenerative deformities, spinal tumors, and pseudoarthrosis, with degenerative disc disease being the most common indication.[1-6] In the presented case we used a lateral, transpsoas interbody fusion technique which allows for direct visualization and access of the intervertebral space while minimizing risk of complications associated with other posterior approaches.[7-9] XLIF procedures have fusion success rates ranging from 85% to 93% at 1-year follow-up.[7,10-12] In addition to the approach, bone biologics play a critical role in facilitating bone formation and ultimately a solid fusion. The current literature suggests that fusion rates of certain bone graft substitutes or allogenic derived bone products may have comparable fusion rates to the gold standard of autologous bone when used as an extender.[7, 13-15] Bone graft substitutes and extenders including products derived from human tissue (e.g. DBM and Cortical Bone Fibers) vary in their properties and mechanism of action based on their composition and how they are processed and sterilized. It is well known in the allograft literature that terminal sterilization with irradiation can affect the properties of the tissue and impact the ability of the tissue to contribute to bone formation. This study aimed to assess a novel Cortical Bone Fiber (Kore Fiber; Processed by MTF Biologics and represented by Kolosis BIO) that is aseptically processed in an instrumented multi-level lumbar fusion case.

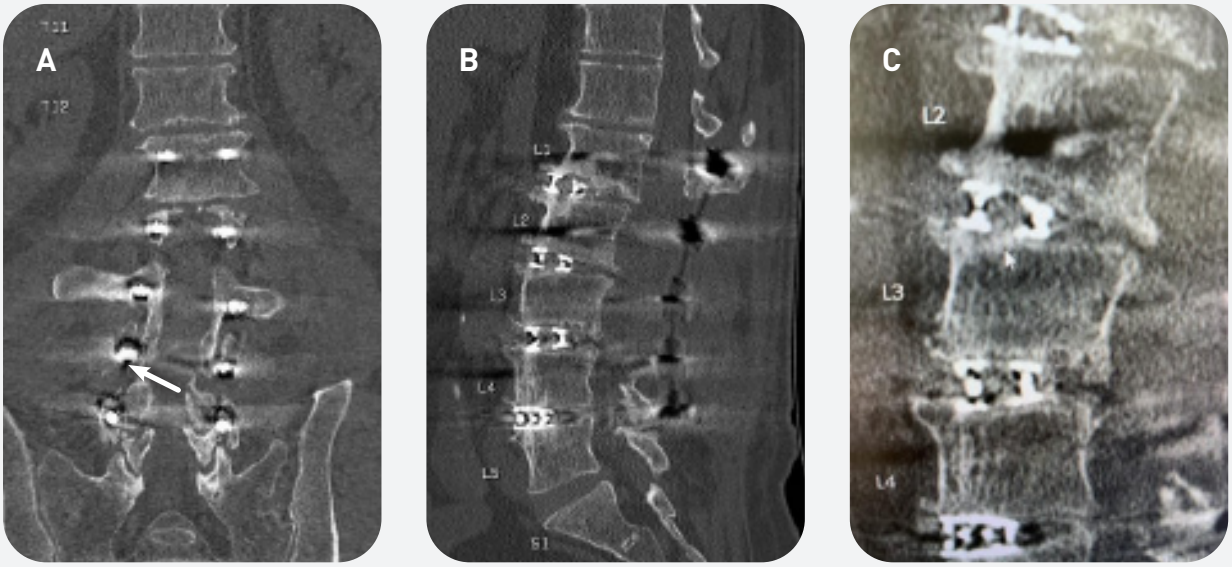
Surgical Procedure

The patient underwent Extreme Lateral Interbody Fusion (XLIF) L1-2, L2-3, L3-L4, L4-L5 with posterior lateral instrumented fusion and laminectomy L1-L5. The decision was made to extend the fusion up to T-11 due to junction concern and down to L5-S1 being left by itself. Mechanical instability was documented in both flexion and extension radiographs with greater than 4mm of subluxation. Kore Fiber (3-10cc moldable, 1-5cc moldable, 1-2.5x10cm Strip) was implanted in the interbody and posterolateral fusion space alone. The operation was performed in two stages on the same day from a left-sided approach. Both stages were completed successfully without any complications. The patient was ambulating on day 0 and showed progressive increase in his ambulation and activities over the next several days. He was discharged on hospital day 5. Fusion was assessed using computed tomography at 3 months.

Clinical Outcome

During the first postoperative month the patient presented to the emergency department for acute onset left hand swelling and redness which was found to be due to a venous thrombosis. The patient otherwise had an uncomplicated postoperative course with near complete resolution of pain. At his one- month follow-up, he only reported pain at the incision site which was expected and well-controlled with medication. His one-month postoperative plain film confirmed stable intervertebral hardware. A follow-up 3-month computed tomography (CT) scan of his lumbar spine was performed which showed successful posterior instrumented interbody fusion between L1 and L5. Oswestry Low Back Disability (ODI) scores were reduced from 10/10 (pre-op) to 2/10 (post-op) at 3-month follow up.

Radiographic Outcome



Evidence of Fusion at Follow-up: (A) Anteroposterior view showing fusion of the facet medial to the screws for levels 3-5. **(B)** Lateral view indicating endplate incorporation at L3/L4. **(C)** Enhanced lateral view indicating endplate incorporation at L2/L3.

References

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