AN INNOVATIVE MODULAR CAGE (INTERFUSE-S™) FOR POSTERIOR LUMBAR INTERBODY FUSION (PLIF). PRELIMINARY EXPERIENCE.

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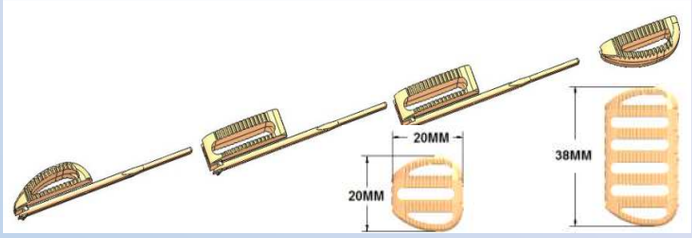
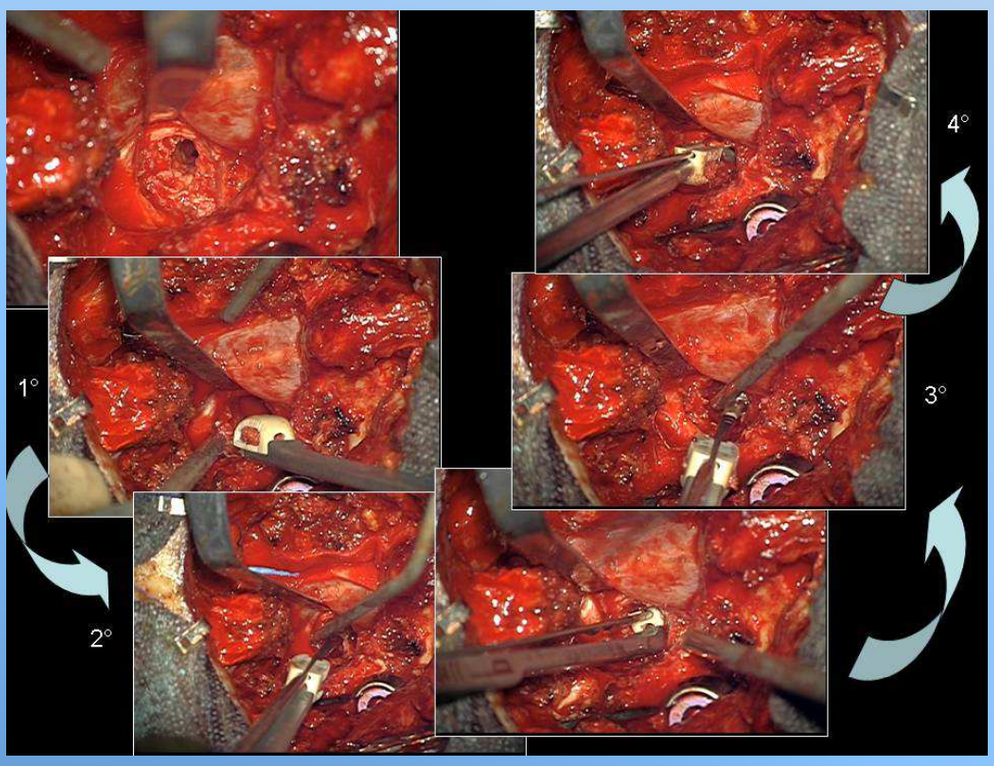
Introduction: A wide endplate coverage by intersomatic cages lowers the risk of subsidence and improves fusion after PLIF. Unilateral cage positioning is a less invasive alternative to the usual bilateral approach. Unilateral PLIF (U-PLIF) offers adequate primary stability, but often requires consistent facet joint resection.

The Interfuse S ™ is an innovative PEEK cage composed of a variable number of small modular segments, intraoperatively assembled within the disc space. This allows to perform unilateral PLIF with wide endplate coverage but with a small access channel, avoiding large artrectomy.



Materials and Methods: Between October 2013 and July 2015, 36 patients (19 men, 17 women, median age 61 years, range 23-81) underwent unilateral PLIF with the use of a modular cage at our institution. Indications included instability with or without stenosis (13), spondylolisthesis (9), recurrent disc herniation (14). In two cases PLIF was performed at two levels (38 implanted cages). Treated levels were L4-L5 (21 cases), L5-S1 (11), L3-L4 (5), L1-L2 (1). Cages were assembled with 4 modules in 34 cases and with 5 modules in 4 cases. Pedicle screw fixation was bilateral in 17 cases and unilateral in 21. All patients underwent immediate post-operative CT scan and follow-up evaluation, including a clinical and radiographic assessment 2 months post-operatively and clinical - CT evaluations at 6 and 12 months.



Intraoperative pictures showing cage implantation.

The disc space is accessed through a limited medial facetectomy. Each module is inserted with a rail-and- slot technique, with the stalk of the previous module acting as a guide. Once assembled, the modules are pushed medially within the disc space.

Left L4-L5 fixation for recurrent disc herniation: postoperative CT showing wide and symmetric endplate coverage by the cage.

Results and Conclusions: Median follow-up was 8,2 months (range 1-22). Cage positioning was straightforward and no surgical complication occurred. Postoperative CT scan always showed appropriate cage positioning and a wide endplate coverage: 55% (range 47-64%) along the transverse diameter and 68% (range 61-74%) along the antero-posterior diameter. Two months after surgery the Oswestry Disability Index was improved in all patients and X-ray did not show any dislocation of the implants except for one case of slight anterior cage displacement which did not require revision surgery. 6-months assessment was available for 10 patients and 12 months assessment for 20 patients: all were still clinically improved and CT did not show signs of pseudarthrosis. According to our preliminary experience, unilateral PLIF can be safely and effectively performed with the use of InterFuse S ™ cage. The small size of every module allows cage insertion through a narrow access channel, thus avoiding artrectomy and undue root traction. This seems to be particularly advantageous during revision surgery, when epidural scar tissue hinders access to the disc space.

Moreover, the wide endplate coverage lowers the risk of pseudoarthrosis and improves load sharing, thus preventing cage subsidence. The material allows for artifact-free CT and MRI assessment.