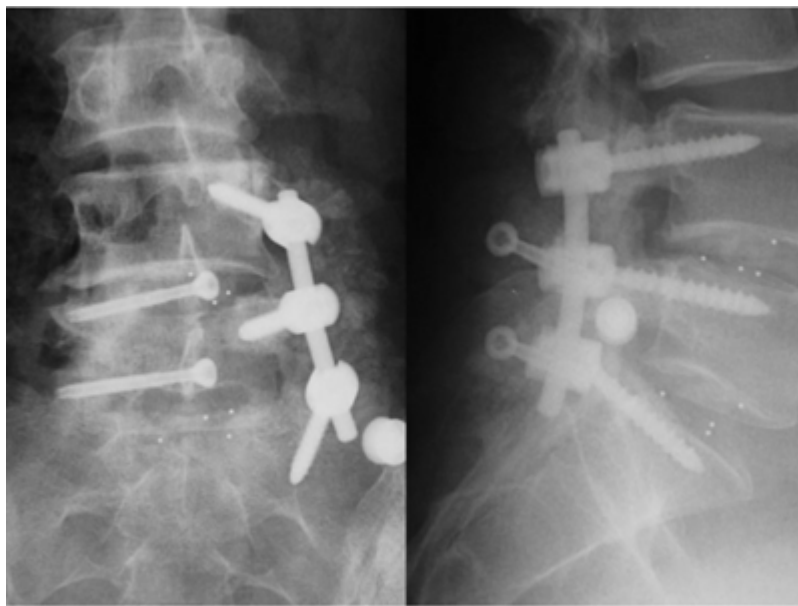


## Contralateral translaminar facet screw



AP view

Lateral view

[Transforaminal lumbar interbody fusion](#) (TLIF) has been used in [lumbar degenerative diseases](#). Some researchers have applied unilateral fixation in TLIF to reduce operational trauma without compromising the clinical outcome, but it is always suspected biomechanically unstable. The supplementary contralateral translaminar facet screw (cTLFS) seemed to be able to overcome the inherent drawbacks of [unilateral pedicle screw fixation](#) theoretically.

Both unilateral [pedicle screw fixation](#) plus [lumbar interbody fusion](#) and unilateral pedicle screw fixation combined with contralateral translaminar facet screw fixation plus lumbar interbody fusion have advantages of small incision, minimal invasion, simple operation, reliable stability, high interbody fusion rate, rapid recovery, encouraging clinical effects and less complications. Compared with unilateral pedicle screw fixation combined with contralateral translaminar facet screw fixation, the operation of unilateral pedicle screw fixation is simpler and can avoid using special equipments. Therefore, unilateral pedicle screw fixation plus lumbar interbody fusion can be used in treating single-segmental lower lumbar vertebra diseases under the precondition of strictly grasping indications for surgery and improving surgical skills <sup>1)</sup>.

The hybrid construct of unilateral [pedicle screw](#) (UPS) + [translaminar facet screw](#) (TLFS) showed instant and long-term equivalent biomechanical ability to that of traditional BPS, making it an alternative option to BPS that could be less invasive while maintains a stable and effective instrumentation <sup>2)</sup>.

Three [instrumentation](#) systems were tested randomly: unilateral [pedicle screw](#) (UPS), UPS with [contralateral translaminar facet screw](#) (UPSFS), and bilateral pedicle screw (BPS).

The [range of motion](#) (ROM) and the neutral zone (NZ) of L3-5 were measured.

All fixation types could reduce the ROM of L3-5 significantly in flexion, extension, and lateral bending, compared with the intact state. In axial torsion, only BPS reduced the ROM significantly, compared with the intact state. The UPSFS technique provided intermediate stability, which was superior to the UPS in flexion-extension and lateral bending, and inferior to the BPS in lateral bending. Compared with the intact state, the NZs decreased significantly for UPS, UPSFS, and BPS in flexion-extension,

while not significantly in lateral bending and axial torsion.

In this study, among the 3 fixation techniques, BPS offered the highest stability, UPSFS provided intermediate stability, and UPS was the least stable for 2-level lumbar spinal disorders. UPSFS appeared to be able to offer a less invasive choice than BPS in well-selected patients with 2-level lumbar spinal disorders <sup>3)</sup>.

<sup>1)</sup>

Zeng ZY, Wu P, Mao KY, Sun DT, Yan WF, Chen GJ, Song YX, Zhang JQ, Tang HC, Han Jian-Fu. [Unilateral pedicle screw fixation versus its combination with contralateral translaminar facet screw fixation for the treatment of single segmental lower lumbar vertebra diseases]. Zhongguo Gu Shang. 2015 Apr;28(4):306-12. Chinese. PubMed PMID: 26072610.

<sup>2)</sup>

Luo B, Yan M, Huang J, Duan W, Huang Z, Chen J, Luo Z, Zhu Q, Li M. Biomechanical study of unilateral pedicle screw combined with contralateral translaminar facet screw in transforaminal lumbar interbody fusion. Clin Biomech (Bristol, Avon). 2015 Aug;30(7):657-61. doi: 10.1016/j.clinbiomech.2015.05.009. Epub 2015 May 22. PubMed PMID: 26043936.

<sup>3)</sup>

Liu F, Feng Z, Liu T, Fei Q, Jiang C, Li Y, Jiang X, Dong J. A biomechanical comparison of 3 different posterior fixation techniques for 2-level lumbar spinal disorders. J Neurosurg Spine. 2016 Mar;24(3):375-80. doi: 10.3171/2015.7.SPINE1534. Epub 2015 Dec 4. PubMed PMID: 26637067.

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