

Hybrid stabilization with ALIF L5/S1 and total disc replacement L4/L5

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Introduction

Spinal fusion in the treatment of chronic painful lumbar degenerative disc disease (DDD) has proven to be effective [1]. Posterior instrumentation with the addition of either anterior or posterior interbody fusion lead to significantly higher fusion rates, but are also associated with higher costs, increased operative morbidity and complications. The lack of expected clinical success of these demanding surgical techniques led to the development of stand-alone anterior lumbar fusion devices that allow for a less invasive surgical approach, which should improve the postoperative outcome. Biomechanically, these devices compare favourably to the techniques of combined anterior–posterior instrumentation. Recently, total disc replacement (TDR) has also proven to be effective in the treatment of discogenic low back pain [2].

Patients with multisegmental DDD resistant to conservative therapy are typically treated with either fusion or non-fusion surgical technique. Anterior lumbar interbody fusion (ALIF) and total disc replacement (TDR) are widely accepted methods for the treatment of DDD [3, 4].

Depending on the stage of the degenerative process either a fusion or a motion preserving technique can be applied.

Case description

A 37 year old female, of a stable psycho-social background, with chronic low back pain due to a two level degeneration of lumbar discs, failed to respond to extensive conservative treatment. Due to a chronic, intolerable functional impairment (Oswestry 32, VAS leg pain 0/10, VAS back pain 5/10), this patient has been selected to undergo a two level anterior lumbar stabilization. Because of the different stage of degeneration at L4/L5 and L5/S1 we decided to use a hybrid technique with an anterior lumbar fusion with a stand-alone cage at L5/S1 (severely degenerated) and a total disc replacement at L4/L5.

Surgical procedure

We exposed the lumbosacral junction and the lower lumbar spine through a retroperitoneal left-sided approach. The blunt dissection down to the disc L5/S1 was followed by the discectomy with mobilization of the motion segment through a good posterior release to allow parallel distraction of the vertebral end plates, introduction of the stand-alone cage and fixation with 3 screws. Due to the special screw/cage-interface design of the Cobra-cage, we have the ability to put the motion segment under compression.

To approach the level L4/L5 is technically more demanding. Normally, we have to mobilize the bifurcation of the iliac vein. One of the most important surgical steps is to control all small vessel branches of the vein and to ligate or coagulate them as necessary. A ligature especially of the ilio lumbar vein is essential to prevent major bleeding.

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After having exposed the disc, discectomy, posterior release and implantation of the total disc prosthesis were performed.

Post-op procedure

Mobilisation is started the day after the intervention. Hospital stay (in our country) is on the average 5–7 days. No strenuous work for at least 8 weeks postoperatively is recommended. Our patient returned to her profession part-time 2 months after the intervention and to full activity after 3 months.

Discussion and conclusion

The presented hybrid technique combines two accepted treatment methods for the therapy of discogenic low back pain. The stage of the disc degeneration determines the selected surgical treatment. The hybrid technique is a good

alternative to either a pure multilevel fusion or non-fusion therapy of the degenerated motion segment.

References

1. Fritzell P et al (2002) Chronic low back pain and fusion. A comparison of three surgical techniques. *Spine* 27(11):1131–1141
2. Blumenthal S et al (2005) A prospective, randomized, multicenter food and drug administration investigational device exemptions study of lumbar total disc replacement with the CHARITE™ artificial disc versus lumbar fusion: Part I: Evaluation of the clinical outcomes. *Spine* 30(14):1565–1575
3. Sasso RC, Kitchel SH, Dawson EG (2004) A prospective, randomized controlled clinical trial of anterior lumbar interbody fusion using a titanium cylindrical threaded fusion device. *Spine* 29(2):113–121
4. Siepe ChJ, Mayer HM, Wiechert K, Korge A (2006) Clinical results of total lumbar disc replacement with ProDisc II: three-year results for different indications. *Spine* 31(17):1923–1932