

Ostapek cages in lumbar interbody fusion.

PLIF vs. ALIF: patient outcome in 331 cases.

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PLIF vs. ALIF



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PLIF vs. ALIF

► **Introduction:**
Ralph Cloward attributed low-back pain to disc space collapse and the resulting unstable joint, and sciatica to the compression of the nerve root at the foramen. Interbody fusion restores disc height while simultaneously immobilizing adjacent segments. However, the success of this surgery has not been universal. Reasons for failure included lengthy healing time of donor bone, difficulty in partially decorticating the endplate, risk of graft retroimpulsion into the spinal canal, and postoperative collapse of the bone graft with resulting instability. Interbody fusion cages were designed to assume the physiologic mechanical requirements. Cellulous bone packed into the hollow center spaces of the cages allows it the protection required to promote fusion.

► **Materials and Methods:**

This series reports the results of 331 patients treated by PLIF or ALIF using ostarPek interbody fusion cages (coligne, Zurich, Switzerland). Data for each patient is compiled using four patient record forms: Five-point scales for back pain, leg pain, neurologic status, patient function and preoperative medication usage were recorded pre- and postoperatively. Operative information included time and blood loss. In addition, any late complications, re-interventions, a radiographic diagnosis of fusion and a patient subjective assessment of the outcome were recorded. One hundred sixty-six PLIF patients and 165 ALIF patients with greater than 12 months follow-up (PLIF: mean 24, range 12 to 60 months; ALIF: mean 21, range 12 to 60 months) were included in this study. All patients were enrolled prospectively. PLIF cages and posterior pedicle screw instrumentation were used to stabilize a total of 213 levels. One-level PLIF was performed on 125 patients (mean operative time = 181 minutes) while 41 patients required either a 2- or 3-levels PLIF (mean operative time = 238 minutes). ALF cages were used alone in 103 1-level and 10 2-levels procedures; the mean operative times were 70 and 113 minutes respectively. Forty 1-level and 12 2-levels patients had combined ALIF and posterolateral fusions with mean operative times of 150 and 168 minutes, respectively. Not all patients were examined at each follow-up timepoint. There were 331 patients (100%) examined preoperatively, 299 patients (90%) at 6 months, 320 patients (97%) at 12 months and 164 patients (50%) at 24 months.

► **Results:**

The presence of fusion in follow-up x-ray studies for the PLIF patients was found in 99% (154/156) at 12 months and 98% (85/87) at 24 months. For the ALIF patients, fusion was found in 99% (163/164) at 12 months and 100% (77/77) at 24 months. Preoperatively, 83% of the PLIF patients and 87% of the ALIF patients were taking medication greater than twice/day. Two ALIF patients were taking no medication at all prior to surgery. At the

one-year follow-up, 57% of the PLIF patients and 71% of the ALIF patients were taking no medication. Medication usage of more than twice per day at one year was 2% for PLIF and was 3% for ALIF patients. Mean preoperative back and leg pain scores for PLIF were 0.99 and 1.19 and for ALIF were 0.91 and 1.90 (where a pain score of 0 = intolerable, and 4 = none). By the 6-month follow-up, these had improved to 3.3 (PLIF leg pain), 3.7 (PLIF leg pain), 3.5 (ALIF back pain) and 3.8 (ALIF leg pain), and these levels have been sustained throughout the follow-up period. There was one graft site pain experienced by 4% of the patients (9 PLIF and 5 ALIF patients); this resolved with time. There was one pseudarthrosis; the PLIF and pedicle screw procedure was repeated and this patient went on to a successful fusion. The patient-rated outcome was 225 (68%) good, 96 (29%) improved, two (2.4%) not improved and two (<1%) worse.

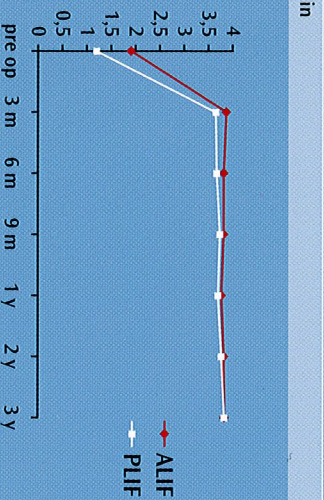
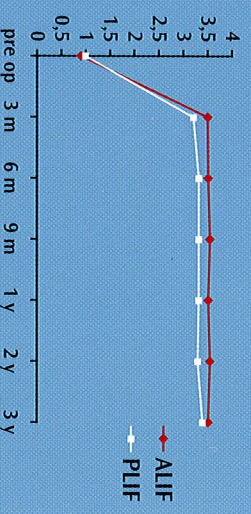
► **Conclusions:**

Performed with interbody fusion cages, we have found the PLIF and ALIF procedures to be beneficial for the majority of patients. However, we are also selective in choosing the patients to receive this procedure.

There must be a correlation between the patient complaint, and the clinical, radiographic and neurologic findings before one can expect a good surgical outcome. Patients presenting with pain but no apparent anatomic and/or mechanical insufficiency are potential candidates for the non-surgical alternatives. Predominate radicular pain without severe discopathy may be treated simply with decompression. Only patients with severe disc disease are candidates for interbody fusion. The presence of instability, the need to correct a spinal deformity (e.g., spondylolisthesis, kyphosis), the presence of multi-segmental disease and any combination of these are indications for interbody fusion. Once the determination to perform interbody fusion is made, then the approach must be chosen. If there is no need to enter the spinal canal or to revise posterior structures, then an ALIF is appropriate – though very often a surgeon's training will dictate his or her enthusiasm for this procedure. ALIF is often indicated in the presence of disc disease with minor posterior degenerative changes. If there is a need to enter the canal space (e.g., severe spinal stenosis, scar tissue, OPLL) or if posterior degeneration requires further destabilization of the segment, then PLIF with posterior spinal instrumentation or ALIF with posterolateral fusion is called for. Above all, the desire is to treat the pathology where it occurs. Case presentations will be made and strategy guidelines with contraindications described.

By combining the correct diagnosis, the appropriate patient and an experienced surgeon, the successful surgical treatment of lumbar disc disease can be achieved.

	ALIF	PLIF
pre op	98	100 %
3 m	38	50 %
6 m	35	49 %
9 m	36	36 %
1 y	29	34 %
2 y	24	30 %

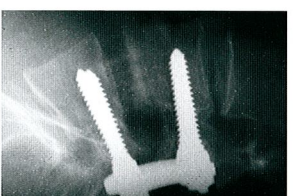
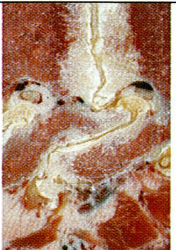


Leg pain

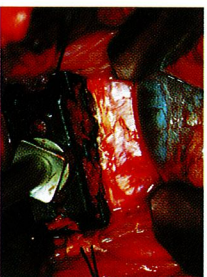
Ability to work

	ALIF	PLIF
n	165	166
able to work	129	142
previous activity	102	125
less demanding activity	27	17
unable to work/working comp.	25	18
unemployed	11	6

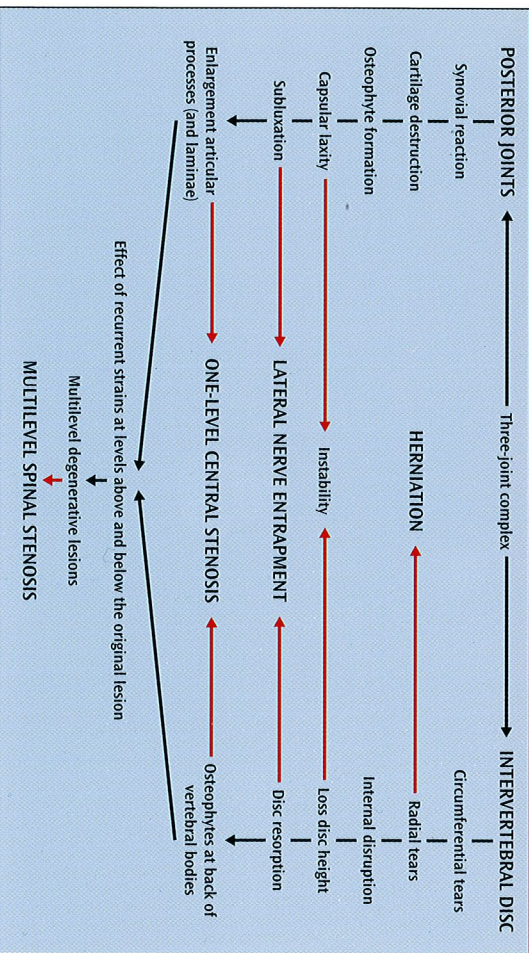
PLIF technique



ALIF technique

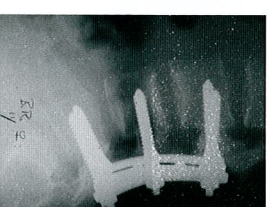
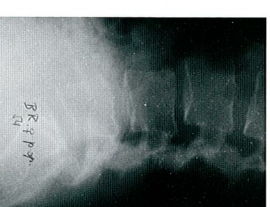
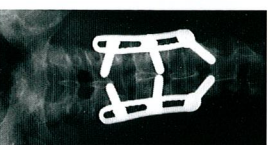


The spectrum of degenerative change that leads from minor strains to marked spondylosis and stenosis



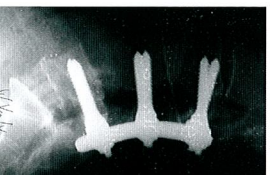
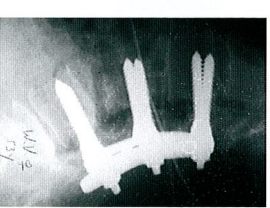
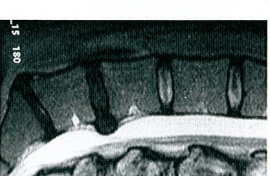
W.H. Kirkaldy-Willis et al. Spine 3(4):319, Dec. 1978

PLIF
Degenerative discopathy and rotational instability



Unstable spinal stenosis with degenerative spondylolisthesis

ALIF
Degenerative disc disease



Severe discopathy L5/S1 after 2 levels PLIF

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