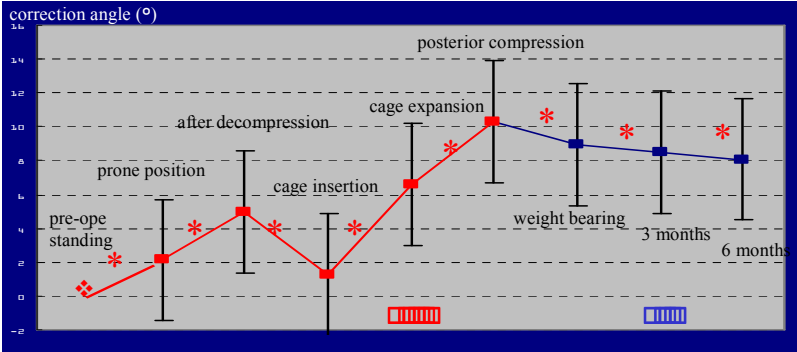


The Effect of Expandable Cages on Changes of Segmental Lordosis in Posterior Lumbar Interbody Fusion

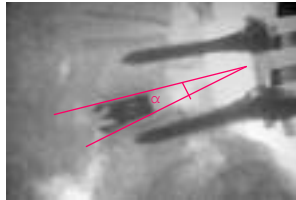
• Results

□ Changes of segmental lordosis



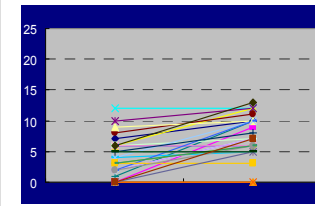
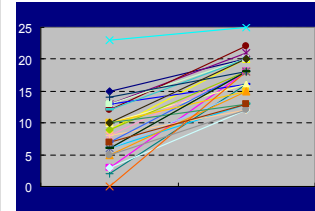
- All intra-operative changes showed significant differences ($p < 0.05$).
- Loss of correction did not occur significantly during follow-up period.

□ Angle of practical cage expansion



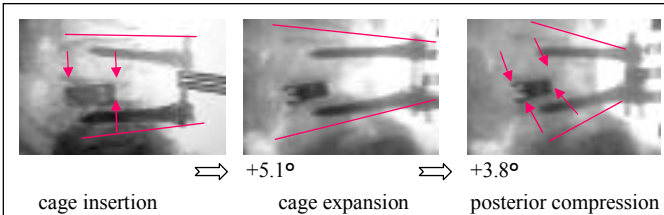
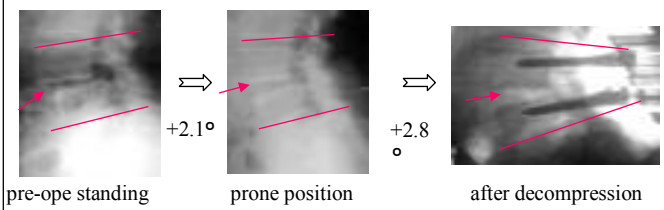
The mean angle of practical cage expansion : 10.5° ($9^\circ \sim 14^\circ$).
Breakage of cages did not occur.

□ Changes of disc heights



Anterior disc height increased 8.4mm,
posterior disc height also increased 3.0mm on average.

• Discussion



- Segmental lordosis increased before insertion of cages ($+4.9^\circ$)
due to \rightarrow * extension of lumbar spine in prone position (2.1°)
* posterior decompression (2.8°)

In situ fusion is not in situ intra-operatively

Excessive forces over screws after weight bearing in PLF (without anterior support)

PLIF has an advantage of dispersing the forces and avoiding failure of instrumentation

- The lordosis changes (before cage insertion) : $-1^\circ \sim 12^\circ$

↓ difficult to predict before surgery

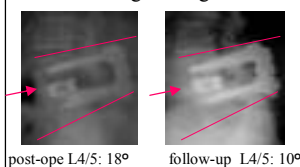
Expandable cages: adjustable to the adequate fitting angle intra operatively

The advantage over other cages

- Decrease of segmental lordosis with cage insertion
 - Anterior endplate: not in contact with cage surface if without expansion (in a rectangular cage)
- Mechanical stress will be centralized on the posterior point of the cage by posterior pedicle screw compression

The disadvantage of rectangular cages to reconstruct and maintain segmental lordosis

A case of cage sinking and loss of correction in a rectangular cage



- Cage expansion to the fitting angle

↓
Dispersing compression forces with the whole surface of the cages

- Reconstruction by two steps
- Avoiding excessive forces over cages and screws

The advantage to reconstruct and preserve segmental lordosis

• Conclusion

Expandable cages have significant effects to achieve successful segmental lordosis in instrumented posterior lumbar interbody fusion.