Long-term Outcome of Fusion for Degenerative Disc Disease in the Lumbar Spine

Endler P, Ekman P, Berglund I, Möller H, and Gerdhem P.

Karolinska University Hospital and Karolinska Institutet, Stockholm, SWEDEN

Background

- Various methods for the treatment of lumbar degenerative disc disease are available
- Data on long term outcome after fusion for lumbar degenerative disc disease in adults are scarce
- The aim of this study was to compare the outcome after the most common surgical techniques available, non-instrumented posterolateral fusion, instrumented posterolateral fusion and interbody fusion (PLIF, TLIF, ALIF)

Method

- The national Swespine register was used to identify 2.874 unique cases with lumbar degenerative disc disease that had novel fusion surgery at one or two levels.

- The risk for additional surgery and the outcome (PROMs) were compared between the three groups.

- Statistical analyses were performed with analysis of covariance, adjusted for baseline differences of the studied variables, smoking, age at surgery, employment status, levels fused, level of fusion and the baseline value of the dependent variable or competing risks proportional hazards regression

Results

- The number of patients with additional surgery were (mean follow up 9.2 years):

  32 (17%) out of 183 in the PLF group

  229 (18%) out of 1,256 in the IPLF group

  439 (31%) out of 1,435 in the IBF group

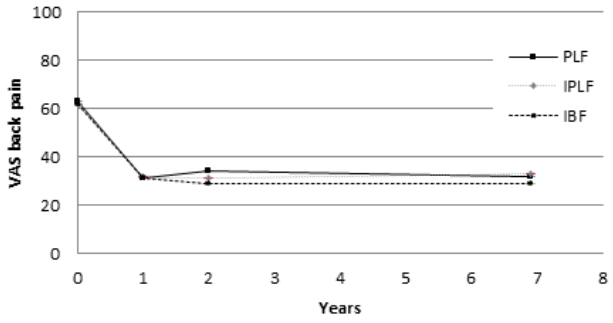
- All patient-reported outcomes improved after surgery ($p<0.001$), but were without statistically significant differences between the groups at the 1, 2, and 6.9-year follow-up (all $p \geq 0.12$).

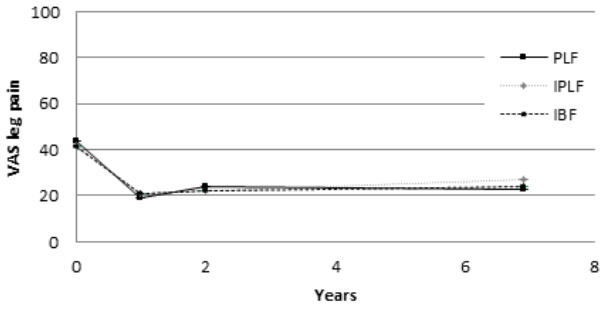
Why reoperation?

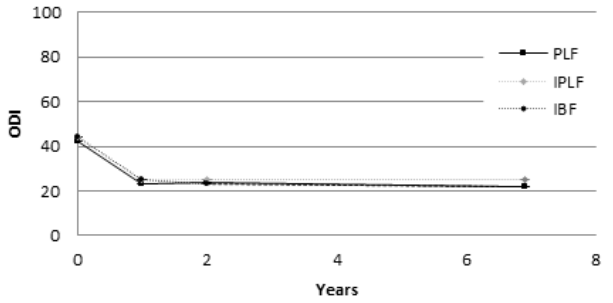
- Out of the 11 reoperations on same level that followed **PLF**;
  - 7 were due to pseudoarthrosis,
  - 2 were due to infection,
  - 2 were due to unspecified causes.
- Of the 128 reoperations on the same level that followed **IPLF**;
  - 70 were implant-related,
  - 15 due to pseudoarthrosis,
  - 7 due to infection,
  - 36 due to unspecified causes.
- Of the 285 reoperations on the same level that followed **IBF**;
  - 179 were implant-related,
  - 50 due to pseudoarthrosis,
  - 8 due to infection, and
  - 48 due to unspecified causes.

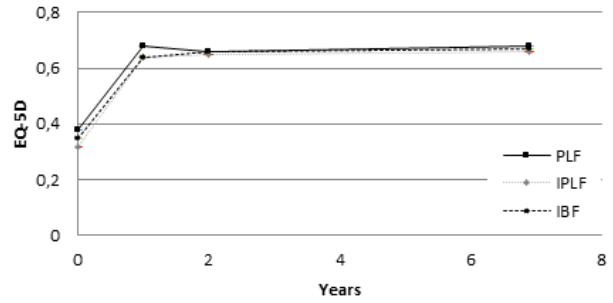
- There were also 21 new procedures on a new level that followed **PLF**;
  - 8 due to degenerative disc disease,
  - 8 were due to stenosis,
  - 5 were due to unspecified causes.
- There were also 101 new procedures on a new level that followed **IPLF**;
  - 48 due to degenerative disc disease,
  - 37 were due to stenosis,
  - 16 were due to unspecified causes.
- There were also 154 new procedures on a new level that followed **IBF**;
  - 94 due to degenerative disc disease,
  - 49 were due to stenosis,
  - 11 were due to unspecified causes.

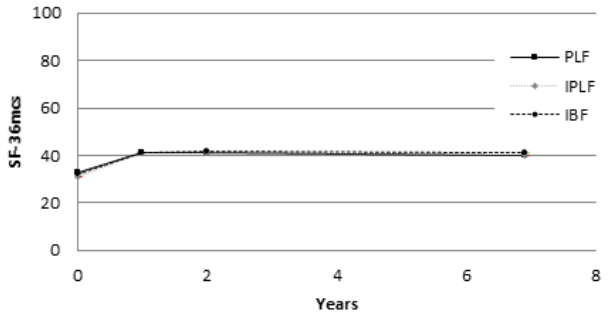
Results longitudinal outcome data

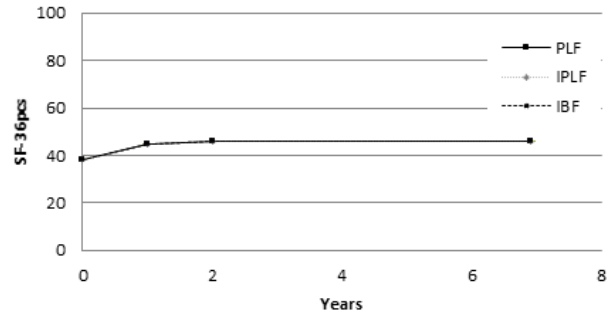




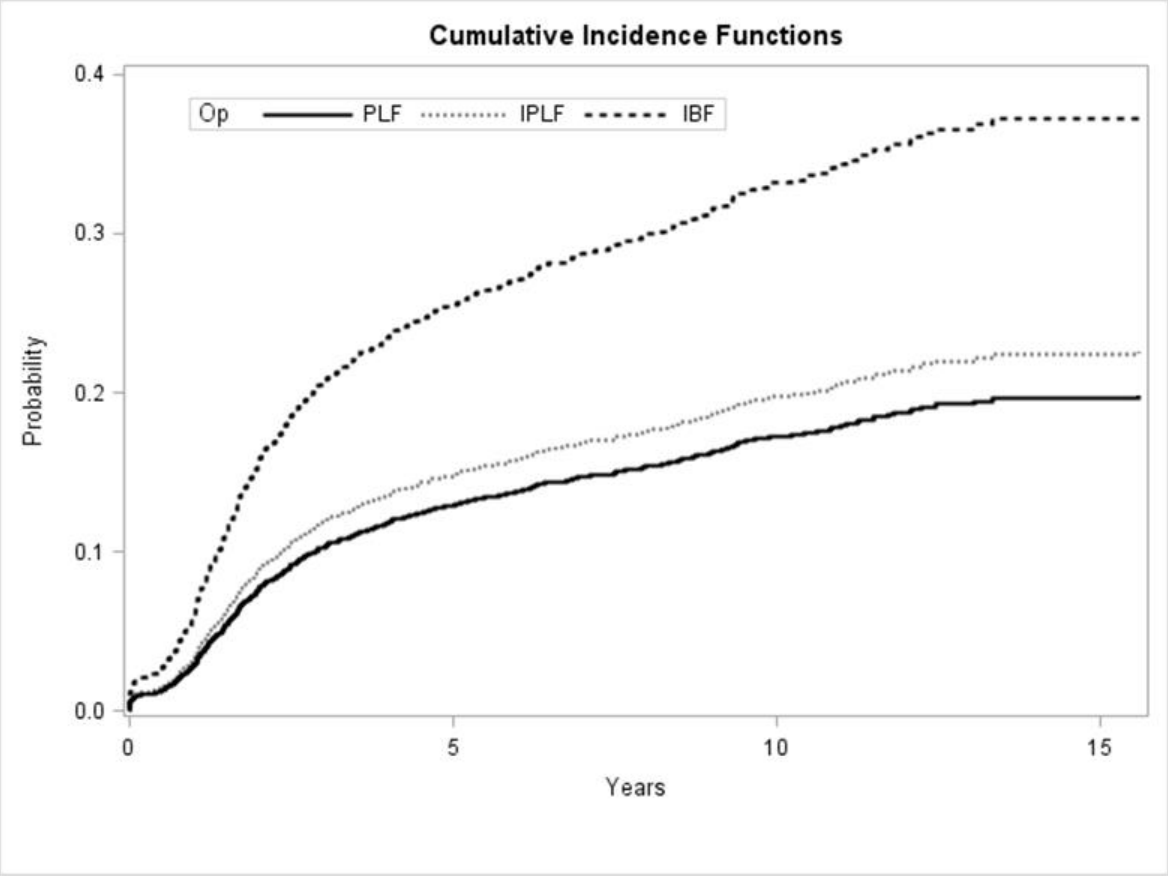








Increased risk of additional surgery



With the PLF group as a reference, the hazard ratio for additional lumbar surgery was 1.16 (95% CI 0.78–1.72) for the IPLF group and 2.13 (1.45–3.12) for the IBF group.

Weaknesses of the study

- Non-randomized design

- Selection bias for the type of treatment chosen by the surgeon cannot be accounted for, as we do not know the reason for the choice of treatment

Strengths of this study

- Sample size
- High follow-up rate
- Long follow-up time (mean 9.2 years)
- Several well validated PROM questionnaires
- Using a national quality register with a high coverage/completeness, and follow-up increase the generalizability of the results because they represent those of the routine surgery performed

Conclusion

- The addition of interbody fusion to posterolateral fusion was associated with a higher risk for additional surgery and were without any advantages in patient-reported outcome.

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