EUROSPINE Best Podium Award 2017
No long time benefit from fusion in decompressive surgery for lumbar spinal stenosis. 5 year-results from the Swedish spinal stenosis study, a multicenter rct of 233 patients
Peter Försth, Thomas Carlsson, Karl Michaëlsson, Bengt Sandén
Dept. of Orthopedics, Uppsala University Hospital, Sweden

What is the research that won the award about?
It is about the role of fusion in decompressive surgery for lumbar spinal stenosis and degenerative spondylolisthesis. See a summary of the presented paper below the interview

What is the outlook of your research?
We will continue the follow-up of the 233 operated patients in the study in regards of clinical outcome, and re-operations. Especially interesting is to identify the reasons for the need of a subsequent lumbar surgery. This leads us further to see if we can identify preoperative clinical and radiological predictors for an inferior outcome and need for second surgery. If we can identify a subgroup in great risk of developing for example instability these patients might be offered to have a fusion in addition to the decompression at the time for the index surgery. Up to resent years, the finding of a degenerative spondylolisthesis on pre-op radiology has been considered as a predictor of instability after decompression and has, according to many surgeons, been a nearly mandatory reason to do a fusion. Our research show that whether or not the decompression is complemented with a fusion does not influence the results in patients with degenerative spondylolisthesis preoperatively. Further, patients with degenerative spondylolisthesis did not have more disability or pain than patients without this finding at baseline. Thus, the importance of the finding of a degenerative spondylolisthesis on pre-op radiological examination has been overrated.
In what respect do you consider this prize valuable for your future research?

The award is an encouragement for further efforts and a welcomed recognition of our studies that have been questioned among surgeons in environments were fusion in degenerative lumbar disorders have been an obvious first choice of treatment. This despite the fact that a foundation in evidence for this regime have been lacking. In recent years, studies which supports our results have been published from researchers in Canada, Norway and Switzerland.

**NO LONG TIME BENEFIT FROM FUSION IN DECOMPRESSIVE SURGERY FOR LUMBAR SPINAL STENOSIS. 5 YEAR-RESULTS FROM THE SWEDISH SPINAL STENOSIS STUDY, A MULTICENTER RCT OF 233 PATIENTS.**

**Peter Försth M.D., Ph.D., Thomas Carlsson M.D., Karl Michaelsson M.D., Ph.D., Prof., Bengt Sandén M.D., Ph.D., Ass. Prof.**

**Dept. of Orthopedics, Uppsala University Hospital, Sweden**

**Introduction**

The role of fusion in surgery for lumbar spinal stenosis (LSS) is a controversy in spine surgery. The aim of this study was to examine if additional fusion improves the outcome after decompression for LSS with or without preoperative degenerative spondylolisthesis (DS). The clinical results after 2 years from this study (published in New England Journal of Medicine in April 2016) showed no benefit from fusion.

**Methods**

From 2006 to 2012, 233 patients aged 50-80 years with spinal stenosis on 1 or 2 adjacent lumbar levels on MRI were included and operated in the study. Randomization was made between decompression with concomitant fusion (DF) and decompression alone (D). The material was stratified for the existence of pre-op DS ≥3 mm on plain X-ray. 135 (58%) of the patients had pre-op DS (mean 7.4 mm). The primary outcome measure was ODI. MRI was repeated 2 years post-op. The follow up rate after 5 years was 91%.
Results

At the 5-year follow-up, there were significant improvements in all outcome measures compared to preoperative regardless of treatment group. For patients without DS, ODI was 27 in both treatment groups ($p=0.80$), back pain (VAS) 37 in the D group and 38 in the DF group ($p=0.84$), and leg pain 32 vs. 34 ($p=0.75$). In the group with pre-op DS ODI was 23 in the D group and 28 in the DF group ($p=0.15$), back pain 33 vs. 38 ($p=0.30$) and leg pain 32 vs. 34 ($p=0.77$). No differences were found in EQ-5D regardless of the presence of DS. In the DS group 58% in the D group and 53% in the DF group reported better walking ability compared to preoperatively, OR 1.2 (95%CI 0.6-2.6). Satisfaction with surgery was reported by 69% in the D group and 67% after fusion, OR 1.1 (95% CI 0.5-2.3). On MRI after 2 years recurrent stenosis on operated level was present in 8% after D and 1% after DF ($p=0.06$). Adjacent level stenosis was present in 16% after D and 40% after DF ($p=0.0005$). The overall proportions of new stenosis in the lumbar spine (index level or adjacent level) was 23% after D and 40% after DF ($p=0.017$). The proportion of patients who had subsequent lumbar surgery within 5 years was 24% in the D group and 25% in the DF group regardless of the presence of DS, OR 1.0 (95% CI 0.6-1.8). Reasons for a second operation was predominantly recurrent stenosis on index level after decompression alone and stenosis in the upper adjacent segment after decompression + fusion.

Summary and conclusions

In this multicenter RCT we found no long time benefit from fusion in decompressive surgery for LSS, regardless of if DS was present pre-op or not. These results confirm the 2-year results published 2016. The development of new stenosis on MRI in the lumbar spine was significantly more common after decompression + fusion compared to decompression alone. Due to the progressive degenerative nature of lumbar spinal stenosis, as many as up to 25% of operated patients had repeated lumbar surgery within five years.

In this elderly population with lumbar spinal stenosis, surgery should be limited to the less invasive procedure of decompression alone in order to decrease the number of complications and costs for the society. The pre-op presence of degenerative spondylolisthesis has by many surgeons been considered as an indication for fusion. This study does not support that regime.