QF-78

# Patient-oriented outcomes after muscle-preserving interlaminar decompression for patients with lumbar spinal canal stenosis: Multi-center study to identify risk factors for poor outcomes

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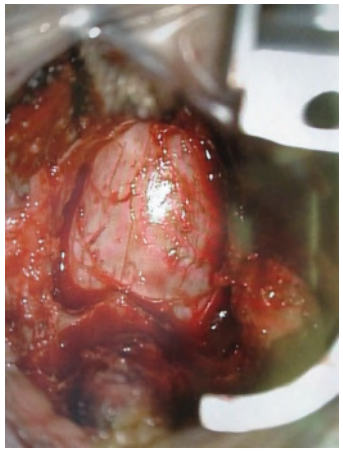
*Background*

# Muscle-preserving interlaminar decompression (MILD) for lumbar spinal canal stenosis

- Microscopic interlaminar decompression
- About 30-mm midline skin incision centered at the interspinous level
- Bilateral facet joint is undercut to expose the lateral margin of the ligamentum flavum, and expose the bilateral nerve roots
- Minimal invasion to the paravertebral muscles and facet joints



Using tube retractor

*Y Hatta et al, Spine 34(8), 2009*

*K Hasegawa et al, J Neurosurg Spine 18(5), 2013*

# Decompression surgery for lumbar spinal canal stenosis

- Decompressive laminectomy maintain substantially greater improvement compared to those treated nonoperatively in pain and function

*Weinstein JN et al, Spine 35(14), 2010*

- Physical function, back and leg pain are significantly improved after 5 years but initial significant improvements in social function diminish over time

*Anjarwalla NK et al, Eur Spine J 16(11), 2007*

There have been few reports about relevance to patients-oriented QOL outcomes and imaging evaluation

## Objective of this study

Reveal risk factors for poor outcomes after muscle-preserving interlaminar decompression (MILD) using patient-oriented evaluation tool and X-ray image

# Indication and contraindication of MILD surgery in this series

## Indication

- Patients who are suffered from leg pain or neurogenic claudication and diagnosed as spinal stenosis by MRI
- Refractory to conservative treatment
- Grade 0-1 spondylolisthesis (Meyerding classification)

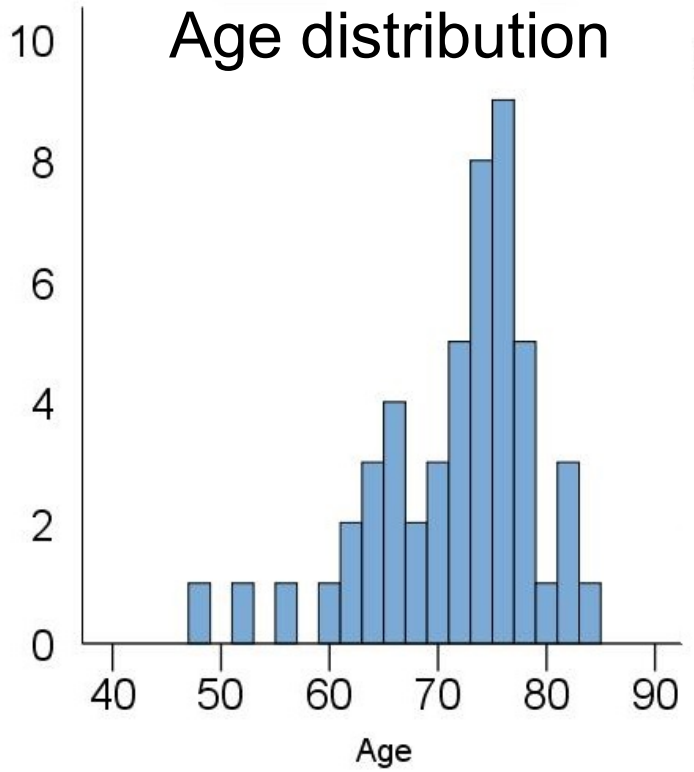
## Contraindication

- Patients whose symptom is lumbar back pain only
- Foraminal stenosis
- Isthmic, pathological, dysplastic, traumatic spondylolisthesis
- Spondyloptosis
- Grade ≥ 2 spondylolisthesis

# Patients and Exclusion criteria

50 / 89 patients

- Minimum 1 year follow-up
  (mean 32.9 months)
- Follow-up rate: 56.2%
- 23 males and 27 females
- Mean age at surgery: 71.1 (48-82)
- Cauda equina type : 41 patients
  Radicular leg pain: 5 patients
- Affected level
  1 for 32 patients, 2 for 17 patients, 3 for 1 patient




Exclusion Criteria

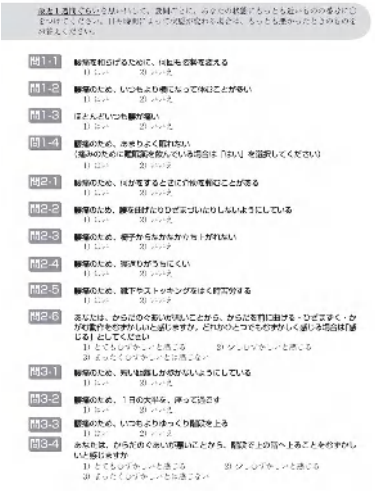
- ✓ Previous surgery for spine
- ✓ Combined with disc herniation

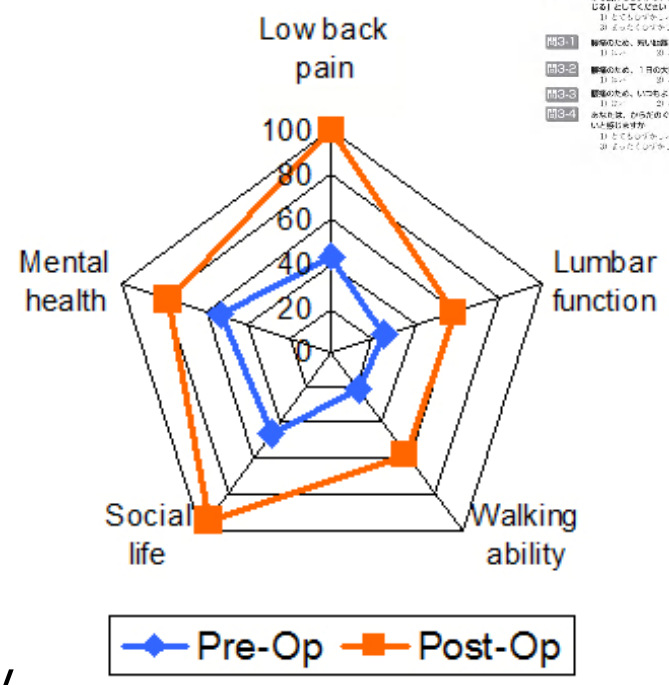
# Japanese Orthopaedic Association Back Pain Evaluation Questionnaire (JOABPEQ)

- Patient-based
- Twenty-five questions

  (Selected from the Roland Morris Disability Questionnare and Short Form 36)
- Summarize to 5 categories

  (Each category: 0-100 points)
  - ✓ Low back pain
  - ✓ Lumbar function
  - ✓ Walking ability
  - ✓ Social life
  - ✓ Mental health
- To be judged “effective”
  - ✓ Increase ≥ 20 points after surgery
  - ✓ Reaches ≥ 90 points after surgery






*M Fukui et al, J Orthop Sci 14(3), 2009*

# Logistic regression analysis

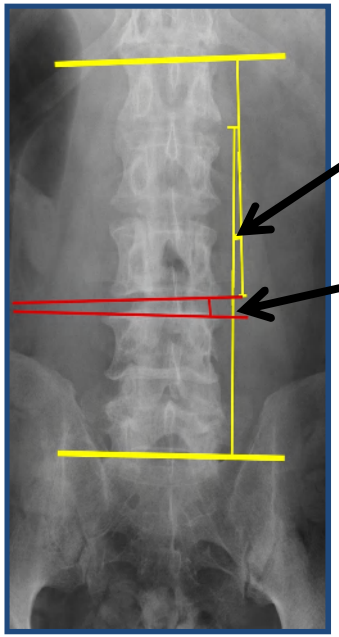
- Dependent variables

  Judged “not effective” by JOABPEQ

- Independent variables

  Age, Sex, Duration of follow-up,

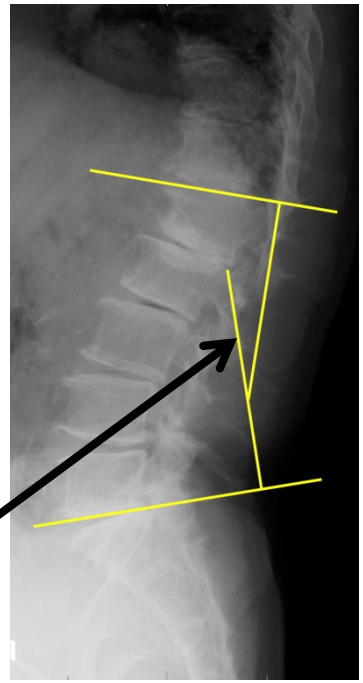
  pre-op and post-op X-ray measurement values ( Five items)



① Cobb angle(°)

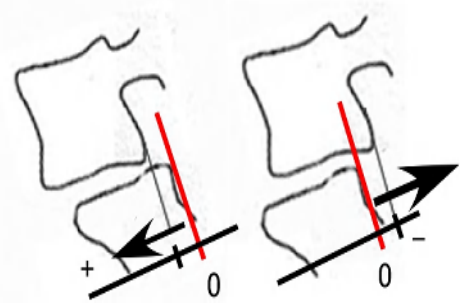
② Disc wedge angle (°)

③ Degree of lordosis (°) (L1-L5)



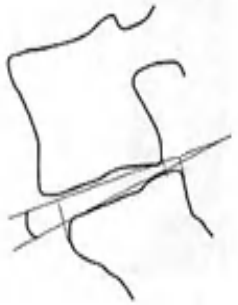
④ Vertebral translation (mm)

⑤ Disc tilt angle(°)




Forward bending

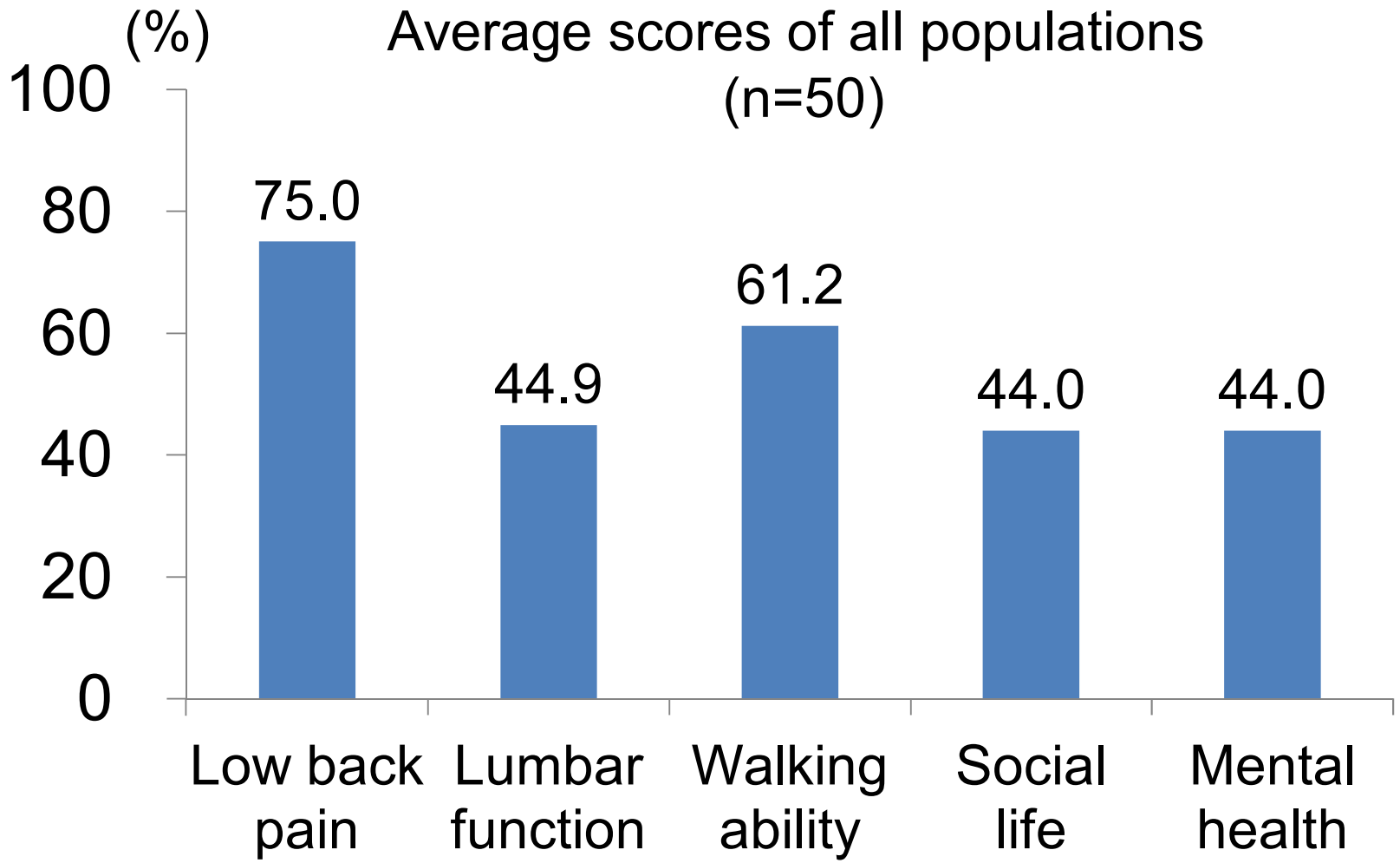
Posterior bending



Natural position

*Result - 1*

# Effectiveness rate of JOABPEQ scores

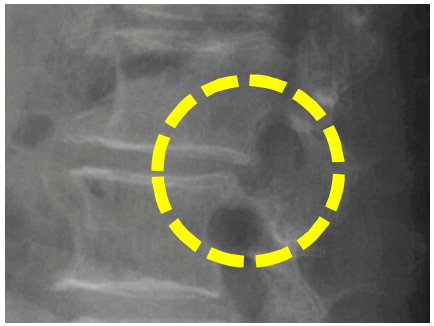


*Result - 2* *Logistic regression analysis*

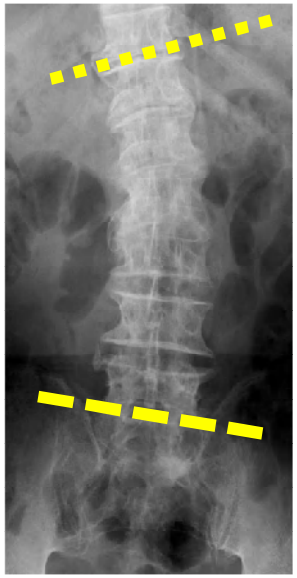
# Risk factors for poor outcomes

| Categories of JOABPEQ | Independent variables | Odds ratio | 95% CI | *P* value |
|---|---|---|---|---|
| Low back pain | Pre-Op Vertebral translation in forward bending (mm) | 0.74 | 0.586 - 0.935 | 0.012 |
| Walking ability | Pre-Op Cobb angle (°) | 1.18 | 1.001 - 1.057 | 0.041 |
| Mental health | Pre-Op Degree of lordosis (°) | 0.94 | 1.009 - 1.088 | 0.033 |

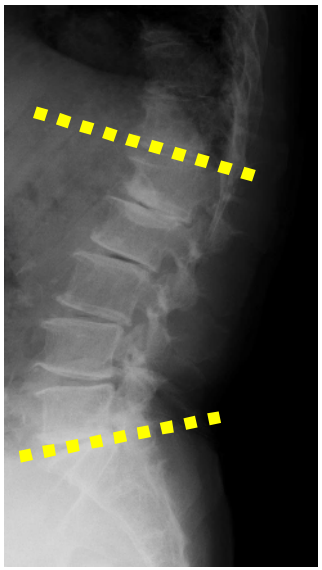
Three risk factors



**Posterior Vertebral translation (≥ 1 mm)**



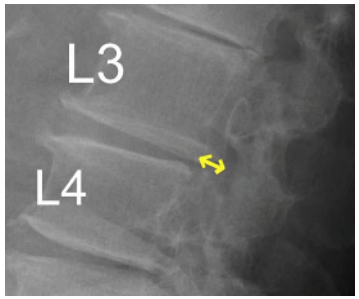
**Cobb angle (≥ 7° )**



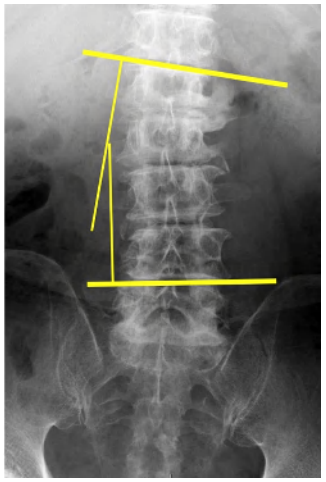
**Loss of lordosis (< 25° )**

*Case presentation*

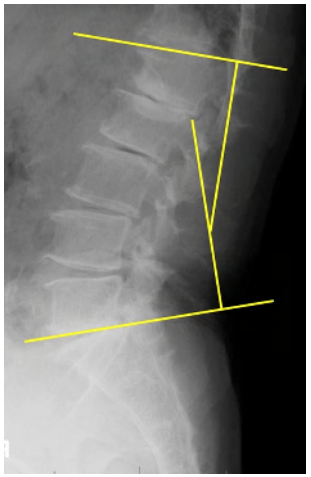
# 78 y.o. Male　L3/4, L4/5 MILD surgery




Posterior vertebral translation in forward bending 4mm (≥ 1 mm)

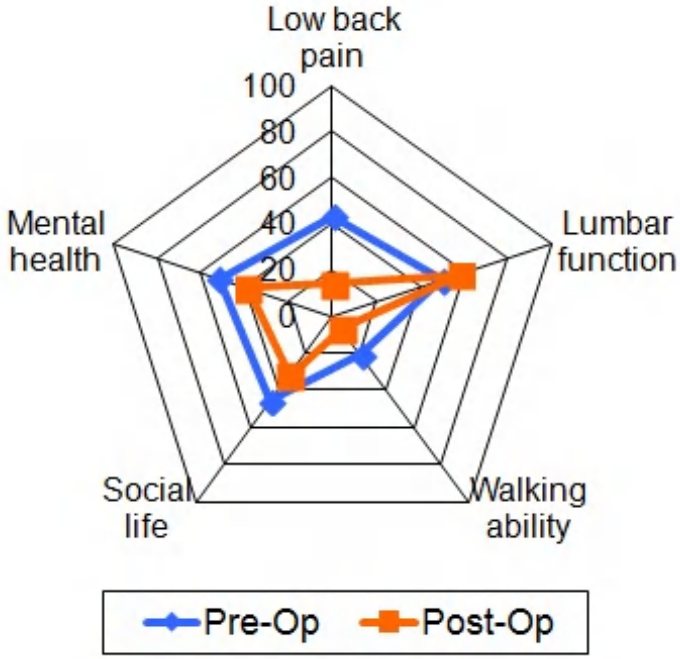


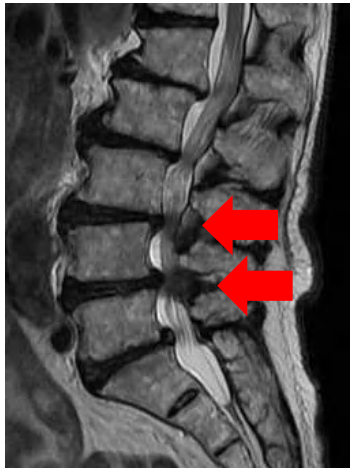
Cobb angle 11° (≥ 7° )



L1-L5 angle 22° (< 25° )

JOABPEQ



Pre-Op

Post-Op 3 years

Three years after surgery represents no remarkable improvement of JOABPEQ scores

# Discussions

- Greater back pain relative to leg/buttock pain at baseline was associated with a significantly worse outcome after decompression *Frank S et al, Spine 34(11), 2009*
- Patients with scoliosis, particularly those with lateral listhesis, did demonstrate a significantly higher revision rate (25%) compared with those with spondylolisthesis alone (4%) or no deformity (0%)

*Michael O et al, Spine 35(19), 2010*

Limitation of decompression surgery to patients whose stenosis with instability or deformity has been unknown

## In this study

Candidate for risk factors of poor outcomes of decompression

Cobb angle ≥ 7° , Loss of lordosis <25°

Vertebral shift in forward bending ≥ 1mm

# Conclusions

- The risk factors for poor outcomes after muscle-preserving interlaminar decompression (MILD) surgery were pre-existence of
  - ✓ Posterior vertebra translation
  - ✓ Scoliosis
  - ✓ Loss of lordosis

## Disclosures

- None of the authors has any potential conflict of interest

## Note

- To know more about Japanese Orthopaedic Association Back Pain Evaluation Questionnaire (JOABPEQ), please visit at :

  http://www.jssr.gr.jp/jssr_web/html/e/oat.html