

360 degrees revision surgery in failed posterior instrumentation for high grade L5-S1 spondylolisthesis

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Patient History

- A 20 year old female with grade 4 spondylolisthesis was treated elsewhere with posterior transpedicular instrumentation performing a L3-S1 fusion skipping L5.
- Her initial symptoms referred to be low back pain with radiation to her legs. Immediately postoperatively, the patient presented improvement of her symptoms.





Which are our treatment options in high grade symptomatic spondylolisthesis?

1. Periodic examination
2. Bed rest and medication
3. Braising
4. Physiotherapy and muscular strengthening
5. Surgical treatment
6. Other

Which are our treatment options in high grade symptomatic spondylolisthesis?







1. Periodic examination
■ 4%
2. Bed rest and medication
■ 2%
3. Braising
■ 2%
4. Physiotherapy and muscular strengthening
■ 13%
5. **Surgical treatment**
■ 77%
6. Other
■ 1%



Which are the indications for surgery in high grade spondylolistesis?

1. Neurological impairment
2. Chronic low back pain
3. Olisthesis greater than 50%
4. Distrurbance of sagittal balance
5. Poor cosmesis
6. Other

Which are the indications for surgery in high grade spondylolisthesis?

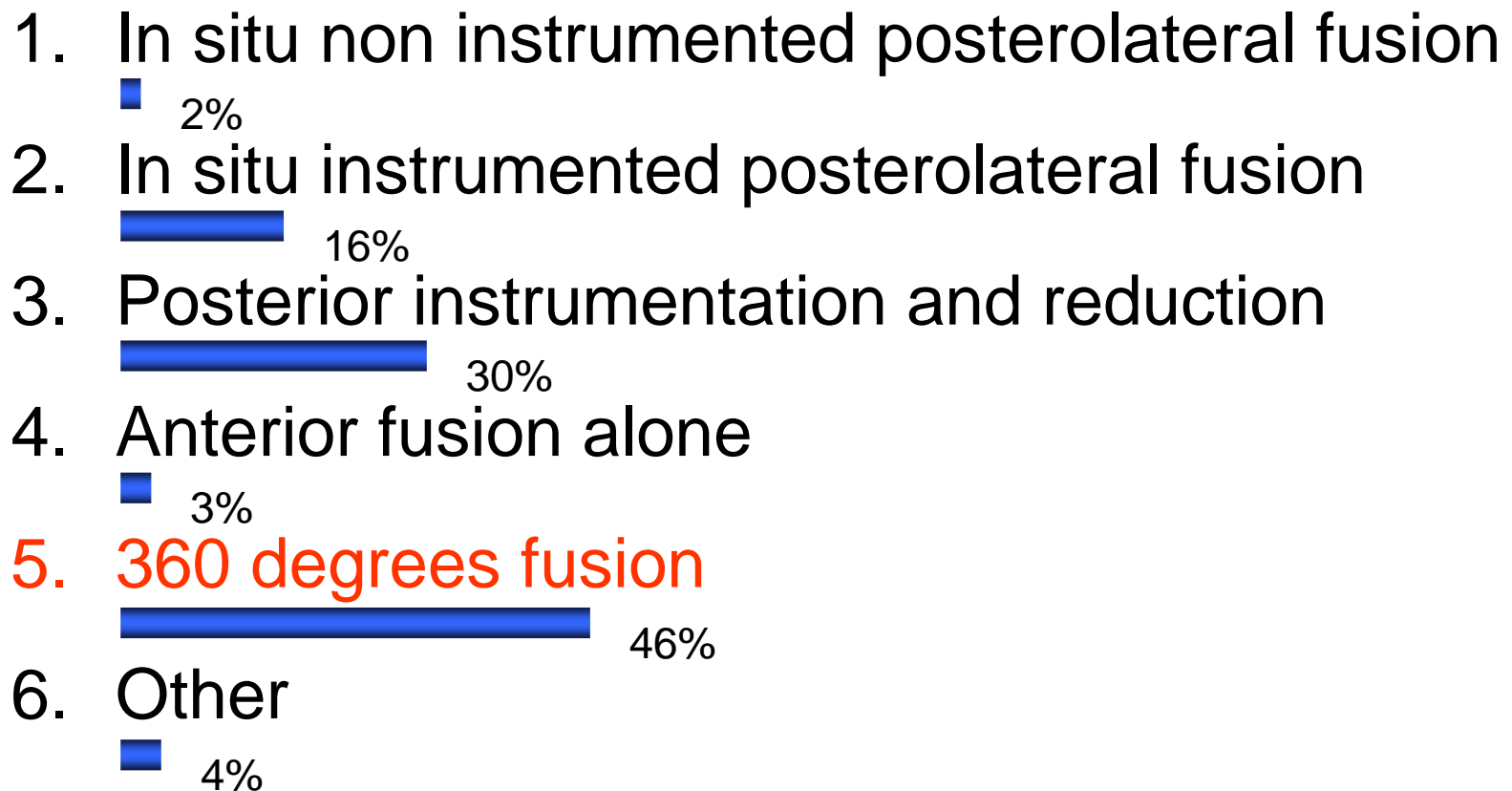
1. Neurological impairment
 80%
2. Chronic low back pain
 58%
3. Olisthesis greater than 50%
 33%
4. Distrurbance of sagittal balance
 44%
5. Poor cosmesis
 5%
6. Other
 4%



What is the preferred surgical treatment for high grade symptomatic spondylolisthesis ?

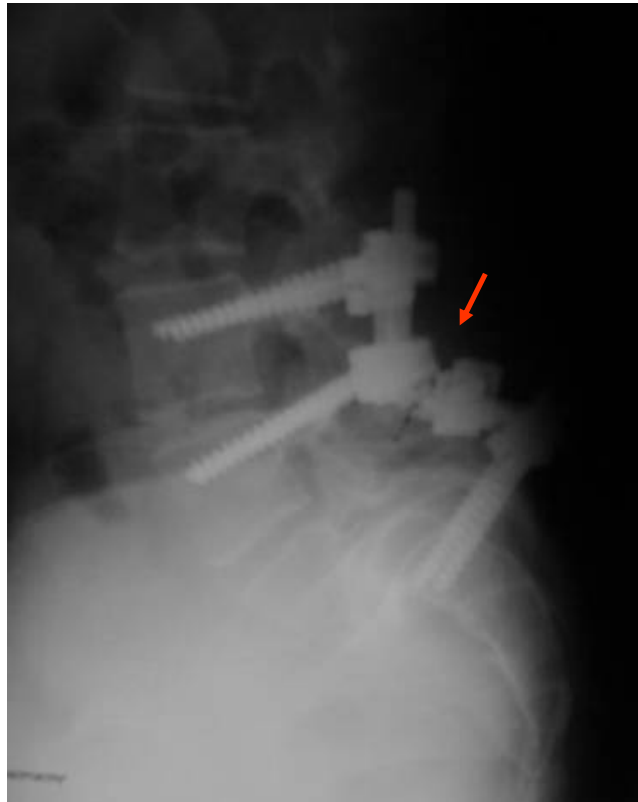
1. In situ non instrumented posterolateral fusion
2. In situ instrumented posterolateral fusion
3. Posterior instrumentation and reduction
4. Anterior fusion alone
5. 360 degrees fusion
6. Other

What is the preferred surgical treatment for high grade symptomatic spondylolisthesis ?



Patient History

- Recurrence of her symptoms referred to start one year after the initial operation with gradual progression.
- Three years postoperatively the patient presented to our department with new low back pain radiating to her legs.
- Radiographic imagination revealed rod breakage, indicating pseudarthrosis that resulted mechanical failure of instrumentation.



What may be the causes of failure of posterior instrumentation in high grade spondylolisthesis?



1. Pseudarthrosis
2. Wrong estimation of biomechanical forces
3. Aggressive patient mobilization
4. Insufficient external support
5. Other

What may be the causes of failure of posterior instrumentation in high grade spondylolisthesis?

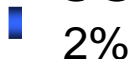
1. Pseudarthrosis



2. Wrong estimation of biomechanical forces



3. Aggressive patient mobilization



4. Insufficient external support



5. Other



Conservative Treatment Options

- Conservative treatment was excluded as an option as the symptoms of the patient produced an unacceptable functional outcome.

Treatment Modalities

- Revision surgery considered to be the most suitable option for the particular patient as she was symptomatic and a constant complainer.

Which is the preferred surgical option in instrumentation failure in high grade spondylolisthesis?



1. Revision with stronger implants and graft augmentation
2. Anterior fusion with bone grafts
3. Posterior revision and 360 degrees fusion
4. L5 vertebrectomy and reduction
5. Revision surgery with reduction
6. Other

Which is the preferred surgical option in instrumentation failure in high grade spondylolisthesis?

1. Revision with stronger implants and graft augmentation
■ 4%
2. Anterior fusion with bone grafts
■ 4%
3. **Posterior revision and 360 degrees fusion**
■ 82%
4. L5 vertebrectomy and reduction
■ 3%
5. Revision surgery with reduction
■ 5%
6. Other
■ 2%

Surgical Options

- Revision surgery was performed as a two stage procedure.
 - In a first stage posterior surgery was performed. After removal of failed instrumentation revision of posterior instrumentation was performed placing one additional screw to L5 and one extra screw to the sacral ala. Exploration of the surgical wound revealed that bone graft was placed only posterior during the initial operation so new additional bone grafts were placed over the transverse processes and the sacral alae. Excessive scarring due to the initial operation made the option of reduction a very difficult and dangerous procedure.
- In a second stage anterior surgery was done through a left retroperitoneal approach. Bone grafts were packed under the prominent part of L5 vertebral body and in front of the sacrum.



- **Outcome**
- Postoperatively the patient presented complete relief of her symptoms. In a two year follow-up the patient remains asymptomatic without evidence of instrumentation loosening or failure, while CT scan indicates satisfactory incorporation of bone grafts.

In Conclusion

High grade spondylolisthesis

- Respect biomechanics
- Restore anterior column
- Achieve solid bone fusion