

rhBMP-2 as a salvage solution in the management of pseudarthrosis after posterior interbody lumbar fusion surgery



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Introduction

Pseudarthrosis after previous lumbar interbody fusion surgery in lumbar degenerative disease, is a highly described topic in spine surgery.

The diagnosis of pseudarthrosis can be objectified by radiological imaging, and is often the etiological problem of new or worsening retractable low-back-pain, as well as radiculopathy. There is limited evidence-based literature concerning possible solutions in the therapeutic management of pseudarthrosis after lumbar interbody fusion.

Results patient 1

Patient 1, a 55-year-old male. He underwent multiple level spine surgery L3-S1, in a different medical center. Radiological findings showed signs of pseudarthrosis on segment L5S1, which could explain his intractable low back pain. A successful stable fusion was achieved after revision surgery using rhBMP-2, resulting in a significant decrease in low-back pain.

Pseudarthrosis

Postoperative stable fusion

The skeleton is a highly active organ that has both structural as metabolic functions. It consists out of a connective tissue matrix and specialized bone cells. These last specialized bone cells are subject to interference, namely the process resulting in continuous bone turnover (osteoblasts, osteocytes and osteoclasts).

Recent studies describe the potential effects in using rhBMP-2 in stimulating bone formation in revision surgery. BMP-2 is a bone morphogenetic protein, which stimulates bone formation. It has multiple possible indications, as well as some important pitfalls. A lot of hormones, growth factors, cytokines have systemic function. Bone morphogenetic protein has the characteristic as a mainly local influencer in bone remodeling.

Methodology



Results patient 2

Patient 2, a 40-year-old male. He underwent a posterior lumbar fusion L5S1, in a different hospital. After revision surgery using rhBMP-2 a stable fusion was created in after 6 months on radiological findings. The surgery resulted into full back pain relief, except for some lumbar muscle rigidity.

A single center study was performed to collect data regarding the use of rhBMP-2 (InductOs) in revision surgery to manage pseudarthrosis after posterior interbody lumbar fusion surgery.

We describe a case series, consisting out of 3 patients, whom have had underwent prior posterior lumbar interbody fusion surgery, in a different medical center, because of degenerative disease of the spine. Two of these patients were male, one was female. The average age in our population group was 50 years (55-40-56).

- The clinical presentation showed instability, radiculopathy, and intractable low back pain.
- Radiological imaging, using Computed tomography, was performed, showing loosening of the pedicular screws. Moreover, an incomplete interbody fusion was described in all three patients on the L5S1 spinal segment, resulting in the diagnosis of pseudarthrosis.
- Dosing of the rhBMP-2 (InductOs, Dibotermin alfa) was equally made in every case, using 1/3th of the total dose, being 4mg on each spinal segment.
- The procedure involved a posterior approach, with removal of the present cages, curettage of the disc space and reinsertion of cages with rhBMP-2. In addition the loosened pedicle screws were replaced.



Pseudarthrosis

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Results patient 3

Patient 3, a 56-year-old woman, whom underwent a multiple level posterior interbody lumbar fusion L2-S1, in a different medical center. After revision surgery, a successful stable fusion was achieved on the L5S1 spinal segment. A significant subjective improvement in pain relief was obtained in a 1-year follow up.

Conclusion

- Our case series describes **successful interbody fusion** after revision surgery, in a posterior approach, using **rhBMP-2** (InductOs). • All patients showed **solid bony fusion** in a 1-year follow-up. • **No side effects** or complications secondary to the use of rhBMP-2 were noted in our population group. The use of rhBMP-2 (InductOs) in spine surgery, more specific in posterior approaches, is safe.
- A correct dosing of rhBMP-2 is primordial because of its potential in bone remodeling, resulting in potential local osteolytic effects or ectopic bone formation.

Pseudarthrosis

postoperative stable fusion

