Heterotopic Ossification



Classification

see Park Grade.

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see McAfee scale.

see McAfee-Mehren classification.

Etiology

Heterotopic ossification (HO) has been reported following total hip, knee, cervical arthroplasty, and lumbar arthroplasty, as well as following posterolateral lumbar fusion using recombinant human morphogenetic protein 2 (rhBMP-2).

Heterotopic ossification occurs in three-fourths of the patients after anterior cervical disc arthroplasty at two years after surgery, but does not necessarily correspond to clinical outcome, nor loss or preservation of ROM. The McAfee-Mehren classification should be combined with ROM evaluation to properly study HO¹⁾.

Data regarding HO following anterior cervical discectomy and fusion (ACDF) with rhBMP-2 are sparse. A subanalysis was done of the prospective, multicenter, investigational device exemption trial that compared rhBMP-2 on an absorbable collagen sponge (ACS) versus allograft in ACDF for patients with symptomatic single-level cervical degenerative disc disease.

To assess differences in types of HO observed in the treatment groups and effects of HO on functional and efficacy outcomes, clinical outcomes from previous disc replacement studies were compared between patients who received rhBMP-2/ACS versus allograft. Rate, location, grade, and size of ossifications were assessed preoperatively and at 24 months, and correlated with clinical outcomes. RESULTS Heterotopic ossification was primarily anterior in both groups. Preoperatively in both groups, and including osteophytes in the target regions, HO rates were high at 40.9% and 36.9% for the rhBMP-2/ACS and allograft groups, respectively (p = 0.350). At 24 months, the rate of HO in the rhBMP-2/ACS group was higher than in the allograft group (78.6% vs 59.2%, respectively; p < 0.001). At 24 months, the rate of superior-anterior adjacent-level Park Grade 3 HO was 4.2% in both groups, whereas the rate of Park Grade 2 HO was 19.0% in the rhBMP-2/ACS group compared with 9.8% in the allograft group. At 24 months, the rate of inferior-anterior adjacent-level Park Grade 2/3 HO was 11.9% in the rhBMP-2/ACS group compared with 5.9% in the allograft group. At 24 months, HO rates at the target implant level were similar (p = 0.963). At 24 months, the mean length and anteroposterior diameter of HO were significantly greater in the rhBMP-2/ACS group compared with the allograft group (p = 0.033 and 0.012, respectively). Regarding clinical correlation, at 24 months in both groups, Park Grade 3 HO at superior adjacent-level disc spaces significantly reduced range of motion, more so in the rhBMP-2/ACS group. At 24 months, HO negatively affected Neck Disability Index scores (excluding neck/arm pain scores), neurological status, and overall success in patients in the rhBMP-2/ACS group, but not in patients in the allograft group.

Implantation of rhBMP-2/ACS at 1.5 mg/ml with polyetheretherketone spacer and titanium plate is effective in inducing fusion and improving pain and function in patients undergoing ACDF for symptomatic single-level cervical degenerative disc disease. At 24 months, the rate and dimensions (length and anteroposterior diameter) of HO were higher in the rhBMP-2/ACS group. At 24 months, range of motion was reduced, with Park Grade 3 HO in both treatment groups. The impact of Park Grades 2 and 3 HO on Neck Disability Index success, neurological status, and overall success was not consistent among the treatment groups. The study data may offer a deeper understanding of HO after ACDF and may pave the way for improved device designs².

Complications

Heterotopic ossification around the hip is a cause of sciatica ³⁾.

Case series

Heterotopic Ossification case series

Case reports

Heterotopic Ossification case reports.

References

1)

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