Polyetheretherketone (PEEK) cage filled with bone morphogenic protein and demineralised bone matrix in anterior cervical discectomy and fusion

Rob D. Dickerman · Ashley S. Reynolds · Brent Morgan

Received: 29 July 2007 / Revised: 30 July 2007 / Accepted: 31 July 2007 / Published online: 28 August 2007
© Springer-Verlag 2007

Dear Editor,

We read with interest the article by Liao et al. on polyetheretherketone (PEEK) cage filled with cancellous allograft in anterior cervical discectomy and fusion (ACDF) [1]. The authors reported on the use of freeze-dried cancellous allograft bone in ACDF with 100% fusion rates and 74% good/excellent outcomes [1]. PEEK has been used in ACDF for years with positive reports on postoperative foraminal height, fusion rates and clinical outcomes [2, 3]. We would like to offer our experience and technique with the use of PEEK and demineralised bone matrix putty combined with bone morphogenic protein (BMP) in ACDF. We have used this technique successfully in hundreds of patients and preface the use of BMP in the cervical spine with a warning. The use of BMP in ACDF has become highly controversial with reports of retropharyngeal swelling and in a larger series of patients complication rates were well above 20% in patients [4]. Smucker et al. reported that over 27% of patients undergoing ACDF with the use of BMP suffered adverse retropharyngeal swelling [4]. It is well known that bone morphogenic proteins initiate an inflammatory response which enhances the fusion rate [2]. The most critical period of bone healing is the first 2 weeks in which inflammation and revascularisation occur [5]. It has also been reported that BMP can lead to allograft and autograft resorption; thus we have now used PEEK grafts

exclusively [2]. We have previously reported on our successful results with a dose of 1.05 mg of rh-BMP-2 (Medtronic, Memphis, TN) [2]. The PEEK interbody grafts combined with rh-BMP-2 have provided excellent results in our patients for both cervical and lumbar spine fusions [2]. The benefit of PEEK grafts over allo/cancellous grafts in the cervical spine is the lack of resorption and maintenance of foraminal height [2, 3]. We commend Liao et al. on their surprisingly high fusion rate with cancellous grafts and would recommend surgeons consider using osteoinductive and osteoconductive products within the centre of the PEEK graft to insure the highest possible fusion rate.

References

1. Liao JC, Niu CC, Chen WJ, Chen LH (2007) Polyetheretherketone (PEEK) cage filled with cancellous allograft in anterior cervical discectomy and fusion. *Int Orthop* DOI 10.1007/s00264-007-0378-x
2. Dickerman RD, Reynolds AS, Morgan BC, Tompkins J, Cattorini J, Bennett M (2007) rh-BMP-2 can be used safely in the cervical spine: dose and containment are the keys! *Spine J* 7:508–509
3. Celik SE, Kara A, Celik S (2007) A comparison of changes over time in cervical foraminal height after tricortical iliac graft or polyetheretherketone cage placement following anterior discectomy. *J Neurosurg Spine* 6:10–16
4. Boakye M, Mummaneni PV, Garrett M, Rodts G, Haid R (2005) Anterior cervical discectomy and fusion involving a polyetheretherketone spacer and bone morphogenetic protein. *J Neurosurg Spine* 2:521–525
5. Smucker JD, Rhee JM, Singh K, Yoon ST, Heller JG (2006) Increased swelling complications associated with off-label usage of rhBMP-2 in the anterior cervical spine. *Spine* 15:2813–2819
6. Kalfas IH (2001) Principles of bone healing. *Neurosurg Focus* 10:1–4

R. D. Dickerman (✉) · A. S. Reynolds · B. Morgan
Neurological and Spine Surgeon,
6200 West Parker Road, Suite 1-503,
Plano, TX 75093, USA
e-mail: drrdd@yahoo.com