Check for updates

Global Spine Journal

Role of Bone Marrow Mesenchymal Stem Cells Concentrate Using Selective Retention Cell Technology in Posterolateral Spinal Fusion

Mohamed Abdelhamid Ali Yousef[1], Giovanni Andrea La Maida[2], Paolo Dionigi[1], Bernardo Misaggi[2], Valentina Vanessa Re[3], Silvia Frau[3]

[1]Department of Clinical Surgical Science, University of Pavia, Pavia, Italy
[2]Department of Spine Surgery, Orthopedic Institute Gaetano Pini, Milan, Italy
[3]University of Milan, Milan, Italy

Introduction

With increasing rate of spinal fusion, the problem of pseudarthrosis which contributes to recurrent pain with patient disability is considered to be the most common cause of revision lumbar spine surgery. Intensive research is being performed to develop an alternative source of bone grafting and improve the spinal fusion rate.

Purpose

Was to evaluate the long-term clinical and radiological outcome of the use bone marrow mesenchymal stem cell concentrate obtained with selective cell retention technology using Cellect (Depuy Spine, USA) with a particular collagen scaffold, Healos (Depuy Spine, USA) for posterolateral spinal fusion.

Patient and Methods

Retrospective review of the hospital records was performed. Then, the identified patients were contacted to have a clinical and radiological evaluation follow-up visit. Demographic data were reported. Preoperative diagnosis, surgical procedure report, previous spine surgery, postoperative complications and any re-operations were registered. Clinical outcome was evaluated using visual analog scales for the back pain (VAS), Oswestry Disability Index (ODI) scores, and quality of life (EQ-5D) questionnaire. Radiological outcome was evaluated by performing plain radiographs including anterior-posterior and dynamic flexion/extension lateral views. Segmental Cobb angle of the fused segment was calculated in the flexion/extension lateral views. Any implant associated complication, development of adjacent segment degeneration and any alteration of normal spinal curvature were reported. Computed tomography (CT) scans were also performed.

Results

All patients (100%) achieved successful fusion. The mean difference of the segmental Cobb angle was 0.5°, ranging from 0.3°-0.7°. CT scans showed solid bilateral fusion with bridging bone (Grade I) in all patients but solid unilateral fusion with bridging bone (Grade II) was detected at 1 patient at one level. Patients started to resume working activities within a mean period of 3.5 months. The VAS score for the residual back pain was 4.2 ±2 while the ODI was 10.7± 5.6 points with the mean disability index was 21.4%.

Conclusion

The use of bone marrow mesenchymal stem cells concentrate obtained with selective cell retention technology is shown be an effective mean for augmentation of spinal fusion.

© 2016 AO Spine, unless otherwise noted.
Manuscript content on this site is licensed under Creative Commons Licenses

DOI: 10.1055/s-0036-1582609 ISSN: 2192-5682