

Feasibility, Safety, and Efficacy of Directly Transplanting Autologous Adult Bone Marrow Stem Cells in **Patients With Chronic Traumatic Dorsal Cord Injury**

Osama Abdelaziz MD; Ahmed Marie; Mohamed Abbas; Mohamed Ibrahim; Hala Gabr

Neurosurgery and Clinical Pathology Departments, Faculty of Medicine, Alexandria University, Egypt and Clinical Pathology Department, Faculty of Medicine, Cairo University, Egypt



Introduction

Bone marrow is a readily accessible source for autologous adult bone marrow stem cells (SCs), which can be applied therapeutically without possessing the risk of immune rejection and without raising ethical concerns. The purpose of this study is to determine the feasibility, safety, and effectiveness of direct transplantation of autologous adult bone marrow SCs in patients with chronic spinal cord injuries

Methods

Thirty consecutive patients (5 females and 25 males, aged 6-64 years) having chronic traumatic dorsal spinal cord injury with durations of at least 6 months were included in the study. Twenty patients were treated with autologous adult bone marrow SCs transplantation via open surgical intraparenchymal and intralesional injection into the site of cord injury. The treatment was continued with monthly intrathecal injection of SCs via lumbar or cisternal punctures. Ten other patients were not treated with SCs and served as control cases

Results

Clinical improvement was observed in 6 (30%) out of 20 patients treated with SCs transplantation. Short duration of injury and small cord lesions correlated with good outcome. Follow up electrophysiological studies did not show statistically significant changes. Follow up MRI did not show significant changes. Minor and temporary treatment-related morbidity were recorded

Conclusions

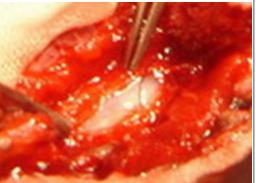
The application of autologous adult bone marrow mesenchymal SCs directly into the spinal cord is relatively safe and has clinical benefits in patients with chronic spinal cord injury. However, multicenter studies should be conducted to further elucidate the safety and efficacy of SCs therapy in patients with spinal cord injury

Figure 1



Sagittal T2 weighted MRI of the dorsal spine showing wedge fracture of D11 and cord compression. Note segmental area of myelomalacia opposite D9-D11 (Black arrow).

Figure 2b



Dural opening at site of cord injury

Figure 2a



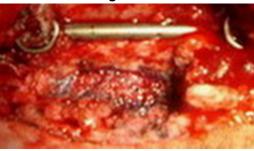
Surgical exposure of injured dorsal cord

Figure 2c



Intraparenchymal and intralesional injection of SCs

Figure 2d



Watertight dural closure with fibrin glue