**Bridging defects in chronic spinal cord injury using peripheral nerve grafts: nerve grafting techniques and overcoming the gliosis; from basic science to clinical experience .**

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**Objective:** We outline our clinical experience bridging defects in chronic spinal cord injury patients using peripheral nerve grafts and overcoming the gliosis by cotransplantation with bone-marrow derived mesenchymal stem cells or by chemical neurolysis. Methods: In twenty chronic traumatic paraplegic patients and after spinal cord exposure, cord defects were grafted and the gliosis overcome by stem cells injected into the whole construct and contained using a chitosan-laminin paste or by chemical neurolysis (chondroitinase ABC, calheparin). Patients were evaluated using ASIA standards.

**Results:** Motor level improved 4 levels in 4 cases and 2 levels in 16 cases . Sensory level improved 6 levels in 3 cases, 5 levels in 6 cases, 4 levels in 6 cases and 3 levels in 5 cases. A 4 level neurological improvement was recorded in 4 cases and a 2 level neurological improvement occurred in 16 cases. The ASIA impairment scale improved from A to C in 14 cases and from A to B in 6 cases. Although motor power improvement was recorded in the abdominal muscles (2 grades), hip flexors (3 grades), hip adductors (3 grades), knee extensors (2-3 grades), ankle dorsiflexors (1-2 grades), long toe extensors (1-2 grades) and plantarflexors (0-2 grades), this improvement was too low to enable them to stand erect and hold their knees extended while walking unaided. Conclusion: Chemical neurolysis and mesenchymal stem cell derived neural stem cell-like cell transplantation enhance recovery in chronic spinal cord injuries with defects bridged by sural nerve grafts.