Bassem Essam Mostafa Mahmoud et al., J Cell Sci Ther 2017, 8:1 (Suppl)
http://dx.doi.org/10.4172/2157-7013.C1.038

Enhancement of Neural Regeneration After Spinal Cord Injury using Muscle Graft

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Background: Spinal cord injury is one of the most important problems facing the world, not only poor countries but also high-income countries. The responsibility of rehabilitation of disabled patients causes a huge financial burden on governments that provide facilities, as well as on patients themselves and societies who pay for their social care (1) .Every year, about 250,000 to 500,000(2) new disabled persons are added to the worldwide burden of patients with TSCI. In USA alone, about 12,000 are added every year (3) In addition to 906 for every million presented in 2014 (4). In Canada, about 1,785 annually (5) .In another area as Australia there is about 14.5 for every million every year (6) .And locally in Egypt there are about 18 TSCI cases for every 100,000 of population (7)

Aim of work: Evaluate the clinical efficacy of muscle grafting in enhancing neural recovery in canine model of traumatic spinal cord injury.

Subjects & Methods:

1. The study subjects were divided into active (muscle graft) and control groups. Six adult dogs included in each group.
2. Induction of SCI model: Dorsal laminectomy (8) was performed with longitudinal incision of the dura then excision of one cm segment of the spinal cord was performed at the mid thoracic region.
3. Graft preparation: muscle graft was taken from the latissimus dorsi muscle during surgery then the dura was repaired to prevent CSF leakage.
4. Grafting procedures: the muscle graft was prepared to fit inside the gap between the proximal end and the distal end of the spinal cord.
5. Follow up: evaluation of recovery was done by:
   - Clinical scoring: By using Olby score(9)
   - Histological examination: H&E sections were examined and showed overgrowth of axons on the muscle graft and the section started to organize as central gray matter and peripheral white matter. CD44 stain was positive for endogenous stem cells.

Results and Conclusions: This study proves the clinical efficacy of muscle grafting as a tool for induction of neuro regeneration after spinal cord injury.

Notes: