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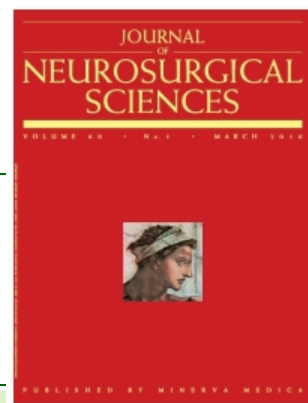
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Mesenchymal Stem cells (MSCs) in lumbar spine surgery: a single institution experience about red bone marrow and fat tissue derived MSCs. Clinico radiological remarks on a consecutive series of 22 patients

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AIM: Mesenchymal stem cells (MSCs) are undifferentiated, multipotent cells, which have the ability to self-renew and differentiate into many tissue types. MSCs have shown therapeutic applications in different medical fields and could represent a successful treatment of degenerative disc disease (DDD). Several studies have demonstrated, ex vivo or in animal models, the MSCs efficacy in spine surgery. The authors aim to demonstrate their efficacy in humans.

METHODS: 22 consecutive patients, who suffered of spine DDD, were submitted: in 11 cases the MSCs were harvested from red bone marrow, 11 from fat tissue. The red bone marrow withdrawal was performed from the vertebral bodies; processed by a fully-automated, mobile system. The fat tissue withdrawal was acted from the subcutaneous adipose tissue; processed through a microfluidic fractioning procedure. MSCs were implanted in the central part of the nucleus pulposus of the DDD or added to bone chips to accelerate posterolateral arthrodesis.

RESULTS: All the 14 posterolateral fusions and MSCs implantations showed at three months a complete bone bridge, stable at follow-up. The one intersomatic implantation gained a complete interbody fusion after 1 month; while 80% black discs treated with MSCs presented a new T2-W hyperintensity at postoperative MRI. The mean VAS pain score improved from 70±20 to 10±5 at 12 months, as the ODI score from 70±5% to 20±10%.

CONCLUSIONS: There are several questions that need to be answered but MSCs look promising in lumbar spine surgery, both to block the aging of the disc both to accelerate the fusion processes in arthrodesis.

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