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New trends in VCF treatment

David Cesar Noriega

Valladolid University Medical School, Spain

Vertebral compression fractures (VCF) is a true concern in the aging population with 700 000 new osteoporotic VCF reported each year in the United States. The progressive deformation of the spine consecutive to osteoporotic VCF can have severe clinical consequences such as chronic pain, reduction of the pulmonary function, and disturbance of the quality of life, as well as a psychosocial impact with altered body image, depression and social withdrawal. Currently, there are two main ways to reduce VCF. The first way is an indirect action exerted on the vertebral body using the ligamentotaxis effect by prone positioning the patient. This treatment can be conservative and includes bed rest and analgesics or it can consist of minimal surgical procedures such as vertebroplasty or percutaneous instrumentation. In the second way, forces are directly applied on the bone of the fractured vertebra (balloon kyphoplasty). These direct forces are supplemented by the forces due to the prone position of the patient during this procedure. All these treatments are efficient in reducing pain and improving quality of life. The ligamentotaxis effect can efficiently reduce the cortical ring using the dynamic mobility of the VCF. Kyphoplasty, compared to conservative treatments or vertebroplasty, allows at best an additional restoration of the vertebral height and of the kyphosis angle. Tzermiadianos showed that VCF provoked endplate deformity that could change the pressure profile of the disc and increase compressive loading of the anterior wall of the adjacent vertebra by 94 +/- 23% in comparison to intact status, and also predisposed to adjacent wedge fractures. However, the initial breakage of the endplate is not enough to initiate this degeneration cascade and an adequate management of the fractured vertebra can indeed allow to restore the endplate and to save the disc integrity. With the current techniques for VCF treatment (vertebroplasty, balloon kyphoplasty), there is in general no real evidence of complete anatomical reduction of the fractured vertebral body prior to its stabilization. Although vertebral height restoration has been demonstrated, fractured endplates reduction is more or less limited. An incomplete treatment could cause different patterns of healing and of alteration of the discs which might be responsible of complications such as recurrent kyphosis after posterior reduction or recurrent pain. Thus, a more comprehensive approach should take into account the anatomical restoration of the vertebral body geometry as a whole, i.e. the cortical ring and endplates and consider the sagittal alignment of the spine.

Biography

David Cesar Noriega is member of the Royal Academy of Surgery and Medicine of Valladolid, as well as Honorary assistant to the University of Valladolid. The research of his PhD was based on the ability to achieve anatomical-biomechanical reduction to vertebral compression fractures. He has published widely in the field of spine pathologies. Actually is the PI of several clinical trials about stem cells, neuromodulation in the spine and vertebral compression fractures as well as is conducting several biomechanical studies about vertebral fractures. He is the Chairman at several training symposium about spine pathology.

dcnoriega1970@gmail.com