

The activated fat in spinal cord injury

Surgical technique

The surgery consists in two different stages: The first one was the most important, since its final goal was to promote the best environment for the spinal cord and also to achieve normal CSF circulation and pressure. This consisted of a laminectomy at four levels with the scar lesion in the centre of the surgical field. The dura mater was opened to make all the scar tissue visible, and the extremities were easily identified by the presence of the arachnoid cysts. When necessary, the laminectomy was expanded one level further above or below, until normal arachnoid tissue and spinal cord appeared. When the dura was opened, the first step was the opening of the arachnoid cysts situated rostral and caudal to the lesion in order to find the layer between the thickened arachnoid and the spinal cord. This layer was found on both sides, above and below. With arachnoiditis tissue fully attached to the dura, some traction could be applied to this thickened tissue, so that dissection could be started on all the dorsal face of the cord between the extremities of lesion above and below to the scar direction. At this point, of the major compression, the arachnoiditis tissue was removed fragment by fragment in order to avoid vascular or especially spinal cord lesions, although some fragments were left behind. The same procedure was performed on both lateral faces of the cord, moving it away from the roots. In thoracic lesions sometimes one or both roots at the injury level could be cut in order to make a complete dissection. The dentate ligaments were cut at all exposed levels. After removal of the fibrotic tissue from the cord posteriorly and laterally, the remainder, which was fully attached to dura mater, was removed. At this stage, it was possible to see that the spinal cord remained in very high tension owing to the remaining ventral adhesions. An anterior dissection was made as far from the mid-line as possible, then the spinal cord was pushed away to the mid-line from both sides with small and light movements in order to release it completely. Long tractions to the roots were avoided. When the spinal cord was finally released on its ventral face, the visible tension disappeared immediately and it was possible to move the cord from both sides. However it was possible to see in 92% of patients that dura mater was in a very high tension due to the existing bone displacements into the canal and also disk fragments, which could promote angulations of the canal and the concomitant high tension of the anterior or ventral face of the dura matter. In all cases dura should be opened in order to remove or correct those abnormal findings. This made it possible to re-establish the posterior wall of the fractured vertebra. The second step was to identify the area of contusion of the spinal cord, which was at the site of the fractured vertebra, or the site of the angulations of bone canal. Between the two posterior medullar arteries a small incision was made in order to see and clean the cavity. Rothon microdissectors was using in order to clean all the gliosis that could be present in all the walls. Once the dissection was made we were able to put the right amount of activated fat to fill the cavity, without making any compression of the surrounding neural structures. Dura mater should be closed without augmentation duroplasty, nevertheless in those cases that CSF could be compromise, augmentation duroplasty should be considered.

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