

THORACOLUMBAR AND LUMBAR VERTEBRAL TRAUMAS TREATED WITH POSTEROLATERAL DECOMPRESSION REVIEW OF 24 CASES

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The authors present the results obtained in a review of 24 patients with vertebral fractures undergoing surgery by means of posterolateral synthesis and decompression. They conclude by recognising the high degree of reliability of this technique which, with a single operation, permits the decompression of the myelofurcular structures and an immediate and stable reduction of the fracture nidus.

The reduction and stabilization of the fracture, and decompression, of the nervous structures are the essential aims of today's treatment of vertebral medullary traumas. For this purpose, over the last ten years, we have witnessed an increasing number of cases indicated for surgery, also cases of thoracolumbar and lumbar vertebral traumas, with or without myelofurcular complications (3,10,12,20).

However, in the literature we still find incomplete agreement on the techniques of surgical reduction, with regard to both type of instrumentation and method of access related to the different types of fracture.

As far as synthesis is concerned, much discussion still goes on with regard to the relative merits of distraction systems, associated or not with sublaminar fixation (3,4,11,17), compared to the more recent systems of transpedicular fixation (2,16,20). Moreover, even with regard to decompression, controversy exists as to the most efficient form of access.

Some authors prefer the frontal approach (5,13,14,15) while others favour access from the back (3,7,9,10,18,19,20).

Also at the Authors' orthopaedic centre (11), where both methods have been used for some time, the need was felt for an investigation in order to better define the indications for posterior decompression by means of a lateral access.

SURGICAL TECHNIQUE

The surgical technique for posterolateral decompression formerly described by Erickson (7) and Flisch (8) in 1977 was recently repropoed by MacAfee (18) in 1982 and Garfini (10) in 1985. It is based on a purely posterior approach which allows a good view of the back arches. Before proceeding with decompression, the fracture is reduced by means of the chosen in-

strumentation on one side only and the state of the nerve structure is studied by means of a hemilaminectomy and a partial articular resection. This is to observe whether the reduction has also given rise to decompression. Should this be the case, the instrumentation is completed, otherwise a full lateral access is carried out. The corresponding radix must immediately be identified and protected during the removal of the transverse-articular block. When this is completed, a good view will be obtained of the back vertebral wall and its connections with the ventral section of the dural sack. At this point, the spongy portion compressing the sack is undercut, maintaining intact until the end the cortex protecting the dural surface.

MATERIALS AND METHOD

From 1985 to 1989, at the Centre of Spine Surgery of the Rizzoli Institute, 24 patients with medullary vertebral traumas were treated using synthesis and posterior decompression. In all patients, a preoperative T.A.C. revealed the presence of compression of the dural sack by a somatic fragment.

The patients were examined by at least one of the Authors and, when necessary, submitted to further radiographic controls and neurological examination. The majority of the patients were males (21 cases) and the mean age was 32 years (17-61); in 11 patients the cause of trauma was a road accident, in 8 work accident, in 2 falls and the remaining 3 sport accidents. All had bursting fractures localized in 16 cases at the level of the T11-L1 segment and in 8 cases in the lumbar region. The vertebra most affected was L1 (11 cases).

In 6 patients the neurological lesion was complete, in 16 incomplete, while in 2 cases no myelofurcular damage was present.

The mean time between trauma and surgery was 46 hours (min. 6 hours, max. 10 days). 14 patients were operated within the first 12 hours.

Posterolateral decompression was associated with

synthesis by means of Harrington-Luque in 10 cases, Roy Camille plates in 10 and by internal fixation in 4 cases.

RESULTS

The results were calculated after a mean time interval of 26.8 months (8-55).

Controls carried out with patients in supine position during the immediate post-operative phase showed how the pathological kyphosis of a mean pre-operative value of 167 (5-35) had fallen to 5 degrees (2-12).

The controls performed during the revisional (under load) showed a mean value of 8.5 with a mean decrease of 3.5 degrees (2-10).

The control to ascertain neurological recovery showed that all the complete forms remained so, while the incomplete forms showed a recovery in all cases.

CONCLUSIONS

The systematic use of C.T. and M.R. in vertebral traumatology has frequently shown that a reduction of the fracture is not accompanied by decompression of the myelofascicular structures. (6)

This is particularly true in the presence of so-called unstable bursting fractures, where the component damaging in flexion is very evident, giving rise to serious destruction of the posterior elements, with a pathological kyphosis greater than 20 degrees and posterior protrusion of the spine. We are in agreement with Denis (1) in defining such fractures as having an instability of the second type.

Thus, it is increasingly considered that the synthesis of the fracture should be associated with the systematic exploration and decompression of the myelofascicular structures (8). Having discarded the simple laminectomy which failed to free the sack where it was compressed, more efficient, as well as decompressive techniques have been proposed (7,18). However, the presence of modern methods of synthesis has rendered the risk of residual instability increasingly remote.

In the thoracolumbar and lumbar regions, decompression can be carried out with both frontal and posterior access. The former seems without doubt more logical and obvious. However, it requires a technical expertise uncommon among orthopedic surgeons, a heavier form of surgery for the patient and the impossibility of performing immediate and efficient synthesis, leading the inevitable necessity of a second opera-

tion for posterior stabilization.

By contrast, posterior decompression permits reduction, synthesis and decompression, by means of a single operation using an approach that is well-known to the majority of surgeons.

Our results confirm the ample possibilities of directly reaching the fracture location using the above technique, obtaining a complete removal or reduction of somatic fragments (FIG: 1,A,B,C,D,E,f).

The visual documentation of decompression is confirmed by an equally clear functional result: all cases with incomplete lesion showed significant improvement in neurological functions attaining independent dcambulation, while there were no complications in cases where lesions were absent. The absence of recovery in the 6 cases with complete lesions was foreseeable and cannot be attributed to the inadequacy of decompression.

We are in agreement with McAfee (19) on the fact that the best indications for posterolateral decompression are incomplete medullary vertebral traumas with bursting lesions in the thoracolumbar and lumbar regions in urgent cases. A particular situation arose in the fracture of the L3 where we observed a constant deterioration of the results. It could be that with synthesis by means of internal pedicular fixation, a more lasting stabilization will be obtained.

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