One stage reduction and fusion for spondylolisthesis

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Summary. A new method of reduction and fixation of spondylolisthesis and spondyloptosis is described. It is carried out in one stage through a posterior approach. Two self-locking plates are fixed to the sacrum and two double threaded screws inserted into the body of L5. The position is restored by lifting L5 up to the plates. An interbody fusion is carried out with autologous bone grafts. The results in 51 cases, with a minimum follow up of 6 months, are reported.

Résumé. L'auteur décrit une nouvelle méthode de réduction et de fixation du spondylolisthésis et de la spondyloptose. Elle est réalisée en un temps par une approche postérieure. Deux plaques auto-bloquantes sont fixées au sacrum et deux doubles vis filetées sont insérées dans le corps de L5. La réduction est obtenue en amenant L5 au contact des plaques. Une arthrodèse lombo-sacrée est effectuée à l'aide de greffons autologues. On présente les résultats de 51 cas, avec un recul minimal de 6 mois.

Operative technique

At first, the patients were operated on in the prone position with their hips slightly flexed. More recently, a knee-chest position has been used and during the course of the operation this is changed to the prone position with slightly flexed hips. The knee-chest position allows easier retraction of the soft tissues, there is less bleeding and reduction is not hindered in easy cases. When there is difficulty, a change is made to the prone position when the plates and screws are in place and before reduction is begun (Fig. 2).

A Y-shaped skin incision is now used (Fig. 3) in preference to a straight incision. The erector spinae muscles are dissected transversely from the upper part of the sacrum and a laminectomy of L5 is carried out. The lamina is already loose and can be removed with a scalpel (Fig. 4). The dura is retracted so that the intervertebral disc and its bony margins can be removed using a special chisel (Fig. 5).

The sacral plates are available in three sizes and different shapes for right and left. The hook-like ends are placed in the 2nd sacral foramen, which does not damage the S2 root, and are locked in position by a barbed hook (Fig. 6a). Fixation is solid, but displacement is prevented by a screw inserted into the sacrum. Double threaded screws (Fig. 6b) are then inserted through the pedicles into the body of L5 (Fig. 6c).

The nuts are screwed on and reduction now begins, the body of L5 being lifted up to the sacral plates. The L5 roots must be watched carefully and reduction stopped if the nerves are unduly stretched.

After reduction bone chips from the L5 lamina and the articular process of S1 are packed into the intervertebral space...
Fig. 1. Diagram showing the principle of the operation

Fig. 2. a The patient is in the knee-chest position for the first part of the operation and b is prone with the hips slightly flexed for the second part

Fig. 3. Diagram showing the skin incision

Fig. 4. After removal of the L5 lamina

Fig. 5. The special chisel with a blade 2.5 cm long

(Fig. 7). The screws are cut off at the top of the nuts and the wound is closed.

Postoperative management. The patient lies supine with thick pillows behind the knees or he may lie on his side. It is important that the hips and knees are flexed to reduce tension on the L5 roots. A plaster cast is worn for 3 months. The patient is allowed up after 2 weeks and is discharged a week later.

It is possible to return to part or full time sedentary work or school after 3 weeks. Full work can be resumed after 8 to 12 weeks. Patients doing heavy work usually need 4 to 6 months to become fully fit.

The criteria for assessing fitness for work are the subjective feelings of the patient, and objective radiographic signs of union between the body of L5 and the sacrum (Figs. 8–10).

Indications for operation

The main conditions for which operation is indicated are spondyloptosis and spondylolisthesis where there is evidence