

SURGICAL TREATMENT OF SPONDYLOLISTHESIS IN GROWING PATIENTS

P.G. Marchetti, R. Binazzi, V. Vaccari, C. Impallomeni, G. Allende, M. Loisi

Clinica Ortopedica dell'Universita - Istituto Ortopedico Rizzoli Bologna - ITALIA

We operated on 126 Spondylolisthesis in growing patients, using different techniques, mostly using an anterior interbody fusion.

Reduction has been performed in 73.8 % of the cases. We had 117 good results. Key

Words : Spondylolisthesis, reduction, anterior interbody fusion.

The problem of Spondylolisthesis is rather complex and shows aspects not definitively clear yet. We will explain only the general principles of surgical treatment of Spondylolisthesis in growing patients according to our experience during the last twenty years.

The purpose of the surgical treatment of Spondylolisthesis are : 1) to eliminate clinical disturbances, 2) to avoid progression of the disease, and, 3) to reduce the deformity and/or to maintain the correction obtained preoperatively. In growing patients, we perform a preoperative reduction when the vertebral slipping is greater than 25 %.

MATERIALS AND METHODS :

We operated on 126 S.L. in growing patients, 48 males (38.1 %), and 78 females (61.9 %). The surgical techniques we employed were : 1) Harrington procedure (1 case), 2) Postero-lateral fusion (3 cases), 3) Postero-lateral fusion using an instrumentation of our invention (12 cases), 4) Postero-lateral fusion with instrumentation followed by anterior fusion (4 cases), 5) Anterior interbody fusion alone (106 cases). All cases after 1975, have been treated with this last technique.

SL is a subluxation or a dislocation of a vertebral body, which has to be eliminated or at least diminished. Reduction, in particular the pre-operative one, it is not strictly necessary, for cases with slipping less than 25 %, especially in subjects close to the end of growth. For slipping less than 25 %, an in situ fusion can be performed, on the contrary, reduction is necessary in young subjects with slipping of more than 25 % and/or with "risk factors" severely positive.

Reduction is achieved according to Scaglietti's technique (which has been gradually modified by us) with a plaster cast using three different forces : 1) longitudinal traction along the spine, 2) anterior rotation of the pelvis, 3) localised and oriented pressure (fixed or graduable) on the vertebral segment below the lesion. It is possible with this technique, to obtain in most cases, a progressive alignment of the slipped vertebral body. Reduction is important because, successive surgical stabilization (particularly with an anterior approach) is easier after the complete reduction or at least the improvement of the local anatomical situation; when there are signs of neurologic deficits, reduction eliminates the pathological tension of the nervous structures; and, reduction results in an improved cosmetic appearance.

When reduction has been obtained, it must be maintained surgically. After trying different techniques we are convinced that anterior interbody fusion is the most reliable technique in the treatment of SL.

For L5-S1 surgical technique has been the following : direct anterior trans-peritoneal approach, with complete removal of the disk, removal of cortical bone from the vertebral plates, preparation of a massive autologous iliac bone graft which is then introduced in the interbody space and internally fixed to L5 and Sacrum bodies with one or two screws. The bone graft is prepared with "grating-shaped" incisures in order to facilitate incorporation. Internal fixation is important both, to enhance incorporation of the graft and to stabilise the implant.

When pre-operative reduction is not sufficient to allow a true and stable sacralization of L5, since the upper plate of SI is not wide enough, we use to widen it up by an anterior vertical osteotomy 5 or 6 cm. long and 3 or 4 cm. wide, after resecting the antero-inferior corner of L5. In the space created we introduce cortico-concellous bone chips. The big bone graft is

P.G. Marchetti M.D., R. Binazzi M.D.,
V. Vaccari M.D., C. Impallomeni M.D.,
G. Allende M.D., M. Loisi M.D.

Clinica Ortopedica dell'Universita-Istituto Ortopedico
Rizzoli Bologna - Italia

then placed between L5 and SI and then stabilized with one or two screws (14 cases).

In some very severe cases, not even the sacral osteotomy is possible. In these cases we perform a partial interbody fusion and apply a big autologous bone graft on the anterior face of the sacrum like a "shelf" which supports the body of L5 (8 cases).

RESULTS :

We had 117 good results and 9 bad ones : of these, 7 were observed in the group of patients treated with posterolateral arthrodesis using the instrumentation of our invention and were due to recurrence of the slipping and progressive kiphotalization of the lumbar spine. The two bad results with anterior interbody fusion were due to technical errors, that is an insufficient bone graft and a too short screw that had to be changed.

In the 106 cases treated with only interbody arthrodesis, we observed 1 paralytic ileum (resolved with a surgical procedure) and three phlebothromboses.

CONCLUSIONS

Anterior interbody fusion is, in our experience the most effective technique for the surgical stabilisation of Spondylolisthesis in growing patients. Posterolateral arthrodesis should be reserved for Spondylolisthesis at multiple levels.

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