Reduction of high grade listhesis

Published online: 4 February 2010
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Keywords

High grade listhesis · Reduction of slip ·
High dysplastic listhesis

Introduction

Reduction of high grade spondylolisthesis allows restoration of sagittal spinal balance with the advantages of placing the bone graft under compression [1–3]. This is highly effective to prevent progression of the slip and allow good bony fusion. It is, however, a technically demanding procedure with a higher rate of neurological complications than in situ fusion. Care must be taken to adequately decompress the nerve roots before reduction maneuvers to prevent neural injury [4].

Case description

A seventeen year old girl presented with low back pain of 3 months duration. On examination, she had flattened buttocks with exaggerated lumbar lordosis, bilateral hamstring tightness and normal neurology. Radiographs demonstrated L5-S1 Grade 4 dysplastic listhesis with a dome

shaped, vertical sacrum and a wedged L5 vertebra. MRI revealed central canal stenosis without a pars defect.

Surgical procedure

A standard midline posterior exposure from L3 to S2 was carried out lateral to the facet joints. Care must be taken to prevent accidental intrusion into the canal or dura during exposure. Subsequently, the L5-S1 facet joints were taken down and the L5 rattler was excised. The upper portion of the L5 lamina was retained to preserve the attachment of the ligamentum flavum between L4 and L5. It is mandatory to ensure that the L5 roots are decompressed bilaterally till well past the neural foramen before attempting a reduction maneuver. The L5 and S1 pedicles were instrumented with poly axial screws on both the sides. The L5-S1 disc space was then prepared thoroughly. Excision of the dome of the sacrum may be done to shorten the spine and prevent distraction injury as well as to allow proper seating of the cage. The L5 pedicles are preferentially instrumented with reduction screws. The reduction device on both L5 screws was then used to pull back the L5 into its normal position. A temporary L4 screws can be inserted to aid in reduction by distracting between L4 and S1. The disc space was then packed with iliac crest bone graft inside an interbody cage. The cages were then compressed to facilitate the fusion process.

Post-op procedure

The patient was mobilized on the second postoperative day after the postoperative pain had settled. A lumbosacral orthosis may be prescribed for additional comfort.

Electronic supplementary material The online version of this article (doi:10.1007/s00586-010-1302-4) contains supplementary material, which is available to authorized users.

Discussion and conclusion

Reduction of a high grade spondylolisthesis is a technically demanding procedure with high chances of injury to cauda equina and L5 roots. This procedure improves the overall spine biomechanics by correcting the local kyphotic deformity and restoring local and sagittal alignment. However, it is important to note that literature has not proven a definite benefit of reduction over fusion in situ in terms of clinical outcome.

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