



Multimodal Assessment of Functional Outcome After Adolescent Idiopathic Scoliosis Surgery

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Background

Surgical treatment of AIS aims to correct trunk and spine deformity. This requires an arbitration between spinal fusion ensuring long term correction and the shortest fusion to limit the loss of spinal flexibility. However, the correlation between fusion length and functional outcome remains controversial. For young patients return to activity and normalized daily life is taken as a rule after 6 months.

Methods

We conducted a single-center study including AIS patients candidate to posterior fusion through multimodal pre- and postoperative one year functional assessment. Evaluation included quality of life (SRS 22, PedsQL), weekly sports practice and back pain. Functional tests included pulmonary function tests, frontal and sagittal segmental spinal mobility (Spinal Mouse), evaluation of subpelvic stiffness and isokinetic trunk muscle strength and endurance.

Results

Thirty patients (mean age 15,5 years, Cobb 59°) were included. We found clinically significant improvement in all SRS scores, with greatest improvement affecting body image and satisfaction, without correlation to fusion level.

Fusion reduced the mobility of the spine but mainly in the sagittal plane (-50% thoracic; -10 to -20% lumbar). The comparison between selective and non-selective fusion showed no significant difference and once again large variability between patients.

PFTs showed no improvement in lung volumes (mean VC 78%).

Postoperatively, muscle performance did not deteriorate, or even improved when the fusion was extended to L3 or L4

Conclusion

AIS surgery is the standard treatment for progressive deformities at the cost of segmentally reduced spinal mobility. However, it does not affect patients quality of life or their ability to enjoy regular physical activity and normal daily life. In most of the patients, muscle performance is preserved or even improved in the case of lumbar curves after fusion, without any specific rehabilitation program. Respiratory restrictive syndrome persists and should be addressed with specific rehabilitation.