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RASTERSTEREOGRAPHIC BACK SHAPE ANALYSIS IN IDIOPATHIC SCOLIOSIS AFTER POSTERIOR CORRECTION AND FUSION

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Objective. To determine the accuracy of rasterstereographic three-dimensional back surface analysis and reconstruction of the spine in idiopathic scoliosis treated by posterior correction and fusion.

Design. Prospective imaging study of 25 patients with idiopathic scoliosis who underwent posterior correction and fusion and were followed for one year.

Background. In an earlier study published in this journal rasterstereography has proved to be an accurate imaging modality for quantifying the changes in the three-dimensional shape of the spine and posterior rib cage after anterior correction and fusion.

Goal of the present study was to determine the accuracy for the more common posterior correction and fusion with attention paid to the presence of the posterior implants and scarring.

Methods. Twenty-five patients with idiopathic scoliosis with maximum Cobb angles of 78° were examined by rasterstereography and radiography. Seventy-one anterior-posterior radiographs were digitised. Twenty-four were preoperative and 47 postoperative radiographs.

Rasterstereographic and radiographic curves were compared by best-fit superimposition. Root mean square differences were calculated as parameters of accuracy.

Results. The accuracy of rasterstereography in severe idiopathic scoliosis with Cobb angles between 48° and 78° was satisfactory with root mean square differences of 5.8 mm for the lateral deviation and 4.8° for vertebral rotation.

Following posterior correction the accuracy was good. The root mean square difference was 4.5 mm for the lateral deviation and 4.3° for vertebral rotation.

Conclusion. The accuracy obtained for posteriorly operated scolioses between 50° and 80° was similar to the findings for scoliosis operated via anterior approach, as well as those with curves up to 50° Cobb angle.

Therefore rasterstereography can be used postoperatively to reduce the number of radiographs and radiation exposure. Additionally, the method provides an objective quantification of the postoperative improvement in the cosmesis of the back shape.

Relevance statement. In the treatment of severe idiopathic scoliosis, rasterstereography provides both a considerable reduction of X-rays and an objective documentation of the cosmesis before and after scoliosis surgery.

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