SUMMARY

The direct incremental segmental translation approach allows more control with better load sharing amongst implants.

INTRODUCTION

We analyzed the biomechanics of two instrumentation paradigms: and rod derotation technique (RDT) vs. a direct incremental segmental translation approach (DIST).

METHODS

Simulations with the RDT and DIST techniques were performed using the same patient biomechanical model built using biplanar X-rays, with same instrumentation levels and rod shape. The correction maneuvers and resulting effects were analyzed and compared.

RESULTS

The vertebra position relative to the rod for the DIST is determined by 5 independent variables (position, orientation) vs. 2 for the RDT; thus increasing the possible correction of the connected vertebra. The DIST allows the spine deformity to be reduced by either gradually pulling the spine towards the rod through helical connections or translating it by pivoting the posts. Load at the vertebra-implant connection was on average 18% lower for the DIST, and better distributed (lower STD).

CONCLUSIONS

The DIST system allows more control with better load sharing amongst implants.

SIGNIFICANCE

This analysis provides insight into the different biomechanical effects of the 2 instrumentation paradigms.