

Comparison of 3 Minimally Invasive Surgery (MIS) Strategies to Treat Adult Spinal Deformity (ASD)

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Introduction

MIS techniques are becoming a more common means of treating ASD. We aim to compare 3 different approaches: 1) Hybrid(HYB): lateral interbody fusion(LLIF) with open posterior instrumented fusion; 2) Stand-alone MIS(saMIS): LLIF only and 3) Circumferential MIS(cMIS) and their ability to treat ASD.

Methods

Retrospective, multicenter study of prospectivelycollected data of 99 ASD pts treated with MIS techniques. Inclusion criteria: age>45; coronal cobb>20°; minimum 1-year follow-up. Patients were stratified into 3 groups: HYB(n=51), saMIS(n=8), and cMIS(n=40).

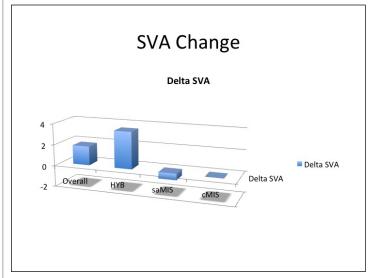


Results

Mean age=64yrs (range=46-84). A mean of 6.7 segments were treated (range=3-16) and mean follow-up 26 months (range=12-58). ODI improved from 45 to 28(p<0.001). Major complications occurred 25.3% of cases. Mean overall preop and postop xray parameters (min 1yr): lumbar coronal Cobb (CC) (38° to 15°), lordosis(LL) (33° to 44°), SVA (4.9cm to 3.1cm), and LL-pelvic incidence mismatch (PI-LL) (23° to 11°) (all p<0.001). For HYB, pre vs. post x-ray parameters: CC (44° to 17°), LL (32° to 48°), SVA (6.7cm to 3.2cm), and LL-PI (22° to 3°) (all p<0.001). Mean ODI improved from 47 to 32(p<0.001). Major complications rate 38%. For saMIS, pre vs. post x-ray parameters: CC (33° to 31°), LL (32° to 38.5°), preop SVA (4.2cm to 4.8cm), and LL-PI (23° to 13.5°) (all p>0.05). Mean ODI improved: 45 to 32 (p=0.037). For cMIS, pre vs. post x-ray parameters: CC (32° to 10°), LL (34° to 40°), and LL-PI (21° to 16°) (all p<0.001). There was no change in SVA. Mean ODI improved from 42 to 23(p<0.001), major complications in 15%.

Conclusions

Although all groups had improvement in ODI, saMIS does not re-establish spinopelvic parameters which is directly related to HRQOL. HYB revealed its ability to affect the sagittal and coronal plane to restore anatomy, however, it comes at the cost of higher complication rates compared to saMIS and cMIS.



Learning Objectives

By the conclusion of this session, participants should be able to: (1) Understand that there are multiple minimally invasive techniques available for surgical treatment of adult spinal deformity; (2) Appreciate differences in radiographic correction and complication rates among various minimally invasive surgical techniques for adult spinal deformity treatment.

