

# Radiological Comparison of Patient-specific & Conventional Rods in Adolescent Idiopathic Scoliosis Surgery

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## INTRODUCTION:

Majority of Adolescent Idiopathic Scoliosis(AIS) patient's surgery utilized screws and rods to correct the deformity. Traditionally, surgeon contours the rods manually intra-operatively. Patient-specific(PS) rods are contoured by machine with pre-calculated measurements. This study is to look for any difference in achieving desired spinal sagittal alignment radiographically between the rods.

## METHODS:

This is a retrospective cohort study where AIS patients from two hospitals, operated by single surgeon between April 2019 to March 2021 were recruited. Pre and post-operative X-rays were taken and measured using RadiAnt-DICOM Viewer. Three sagittal parameters, namely pelvic incidence-lumbar lordosis difference(PI-LL), pelvic tilt(PT) and sagittal vertical axis(SVA) were measured and analyzed statistically. PS-rods are bend with the aim to achieve PI-LL<10 degrees, PT<20 degrees and SVA<40mm.

## RESULTS:

We recruited 33 patients, 18 operated with PS-rods and 15 with conventional rods. For comparison between pre and post-operative X-rays of PS-rods, all parameters (PI-LL, PT, SVA) mean difference are statistically insignificant (P=0.447,0.578,0.814). As for conventional rods, only mean difference for PI-LL which is reduction of 9.13 degrees is statistically significant (P=0.005). Comparison between changes of all three sagittal parameters and both types of rods are also showed no statistical significance in this study (P=0.585, 0.735, 0.651). However, PS-rods has higher percentage in achieving planned sagittal parameters

compared to conventional rods in PI-LL, PT and SVA.

## DISCUSSIONS:

The result of the study showed that pre and post-operative sagittal parameters difference is statistically insignificant. However, in terms of achieving planned parameters, PS-rods showed higher percentage compared to conventional rods. This probably due to decrease in errors and inconsistency in manual rod contouring. This study is limited with small cohort and short follow up, which further study with larger sample size needed for more accurate analysis.

## CONCLUSION:

This study showed PS-rods able to achieve better sagittal parameters radiologically compared to conventional rods and can be considered when operating AIS patients, due to elimination in human factor in rod contouring.

## REFERENCES:

1. F.Solla et.al. Patient-specific rods for thoracic kyphosis correction in AIS surgery: preliminary results. Ortho&Trauma: Surgery&Research(2020)