

# Spinal deformity and spinal stiffness are related to each other

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## INTRODUCTION

The importance of spinopelvic analysis in pre-operative THA planning is well established.

This study aims to investigate the relationship between three measures of spinopelvic mobility that are routinely analysed from lateral radiographs to identify high risk patients

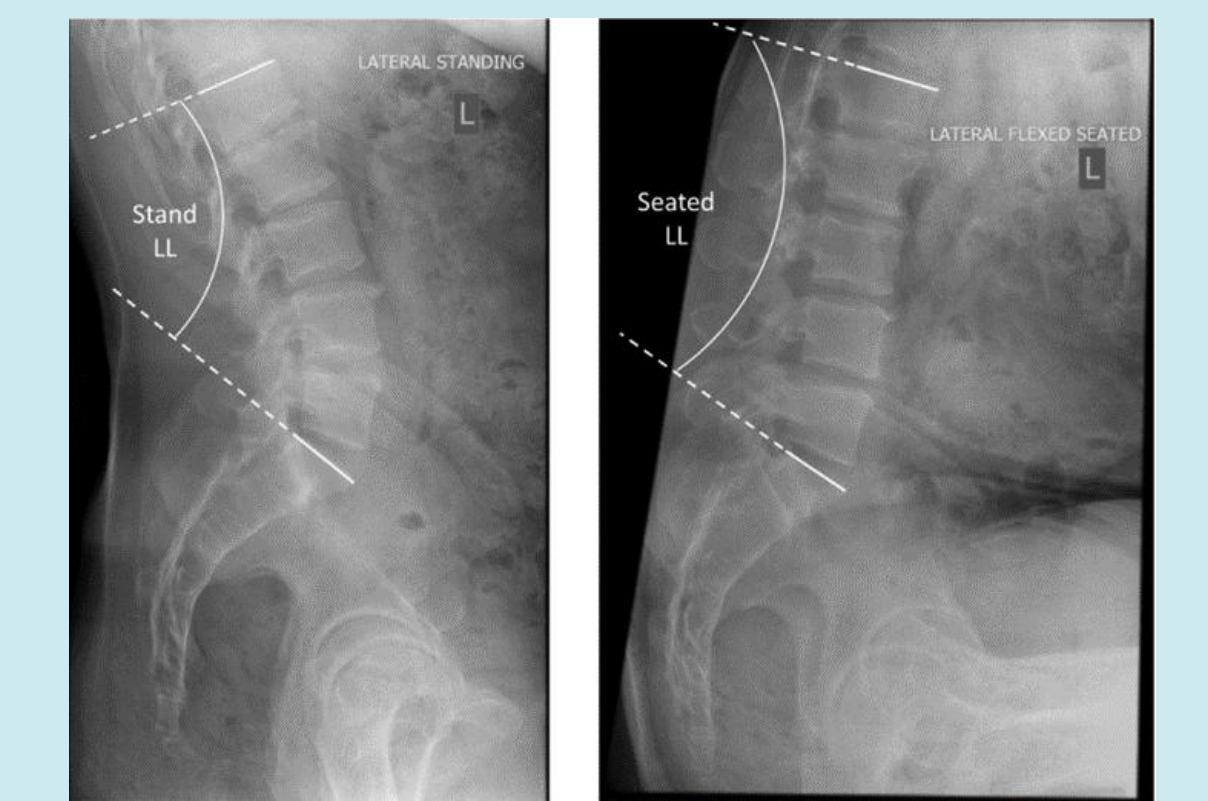
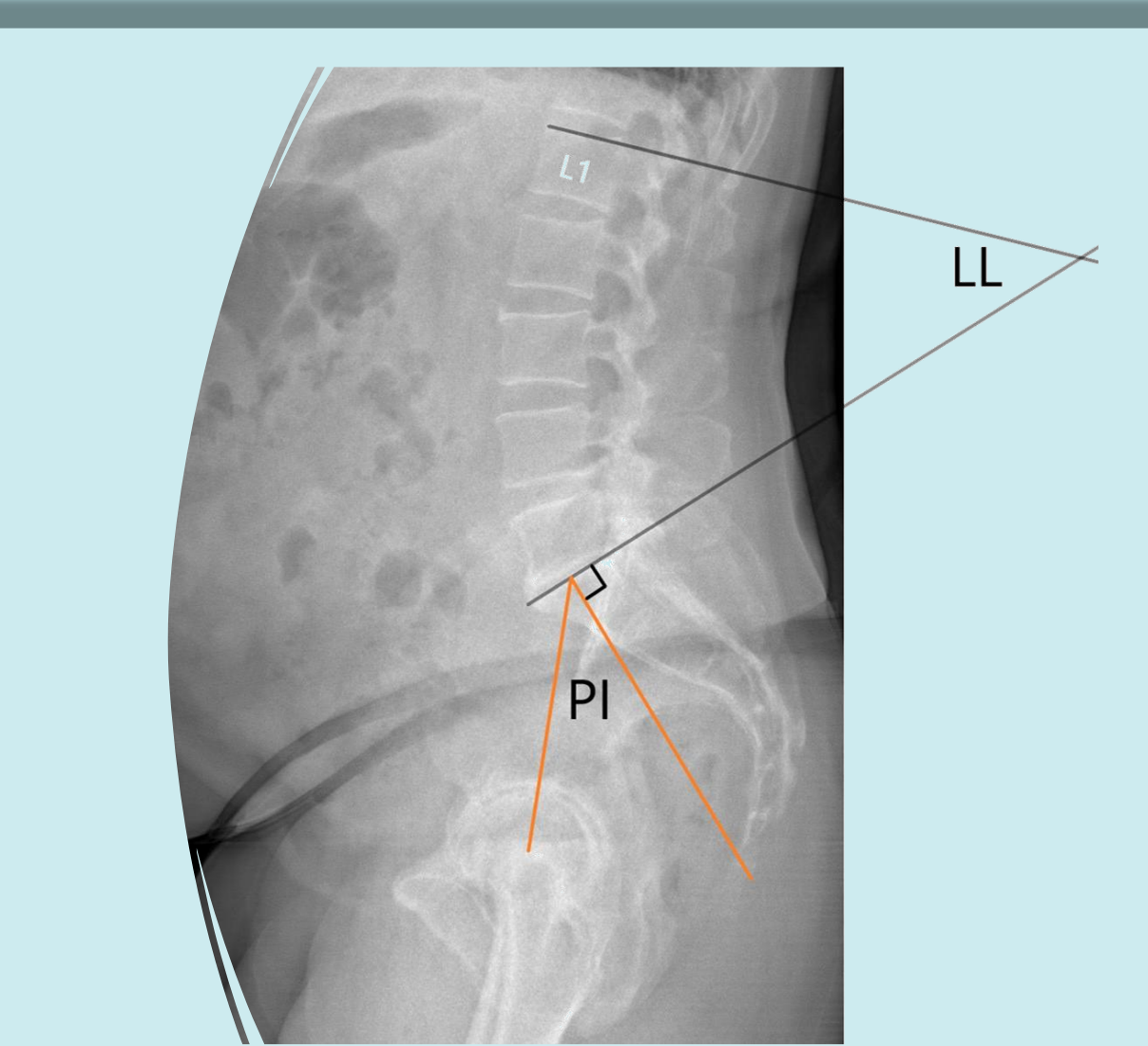


Fig 1: 3 measures of spinopelvic mobility<sup>1,2</sup>

### PI-LL

- Spinal alignment
- Flatback: PI-LL > 10°
- Flatback patients 4.1x more likely to dislocate<sup>1</sup>

### ΔSS

- Stiff: ΔSS ≤ 10°<sup>2</sup>
- Widely used to classify patients for stiffness

### Lumbar Flexion

- Stiff: ΔLL ≤ 20°<sup>1</sup>
- Stiff patients 8.7x more likely to dislocate<sup>1</sup>

## METHOD

Spinopelvic analysis was performed for 270 elective hip arthroplasty patients using the Navbit Rapid Surgical Plan®.

The spinal pathology of each patient was also assessed and categorised as:

- Normal
- Mild
- Moderate
- Severe.

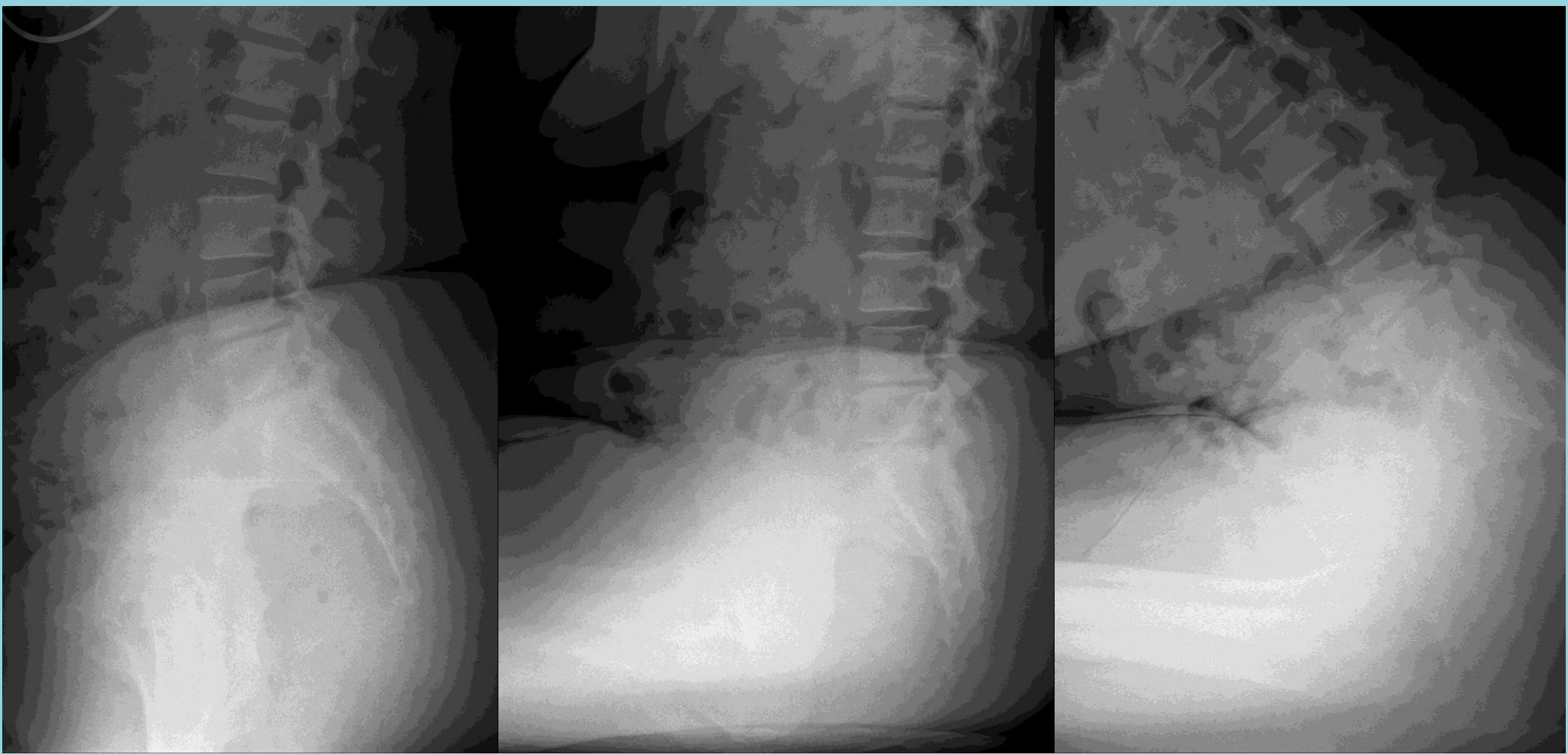


Fig 2: Functional images used for spinopelvic analysis.

## RESULTS

11% of patients had a stiff lumbar flexion and 26% had a stiff ΔSS. When reclassifying by lumbar flexion, approximately half of those initially labelled 2B<sup>3</sup> were no longer identified as stiff.

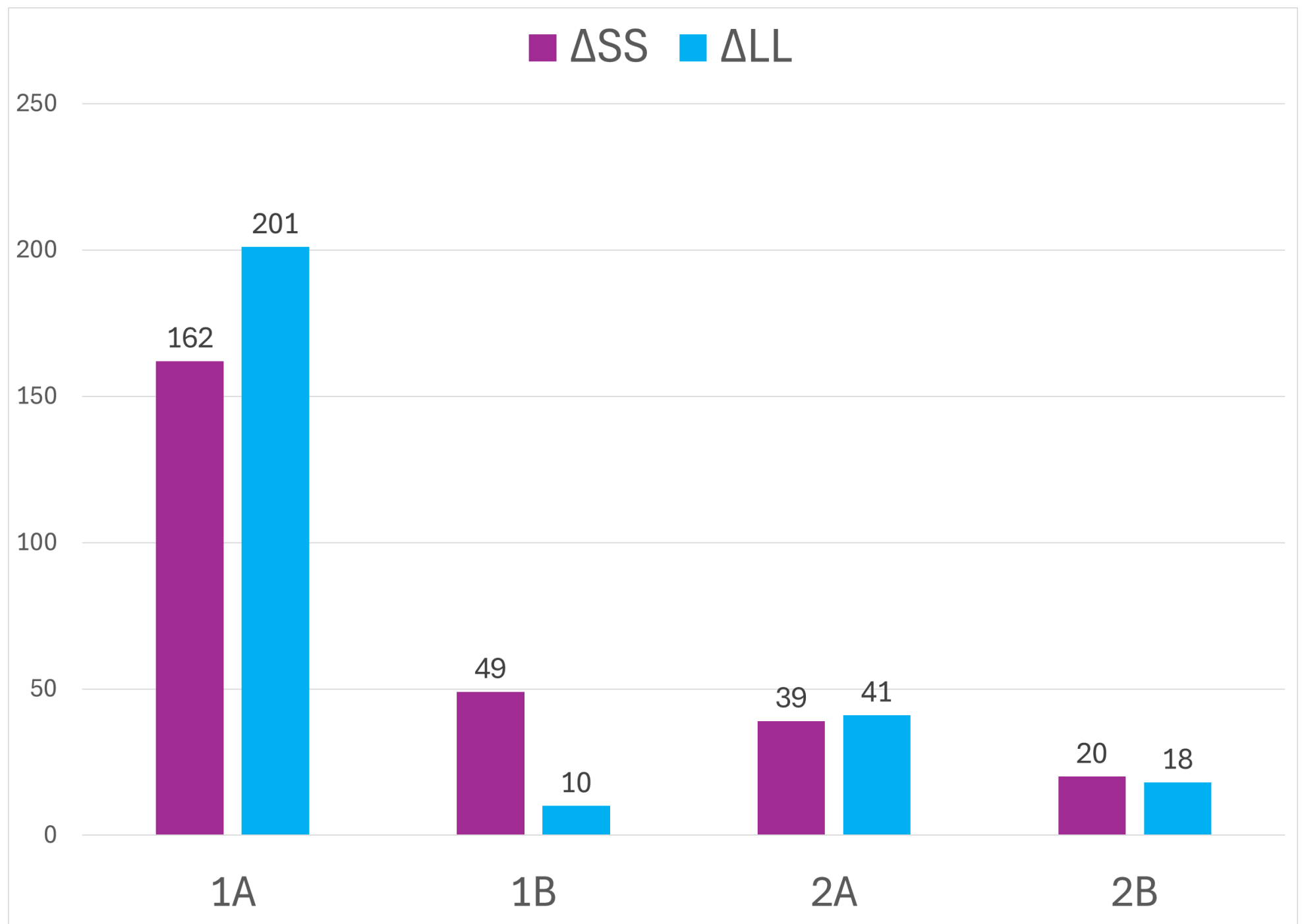


Fig 3: Large difference in patients classified as “1B” between the two groups

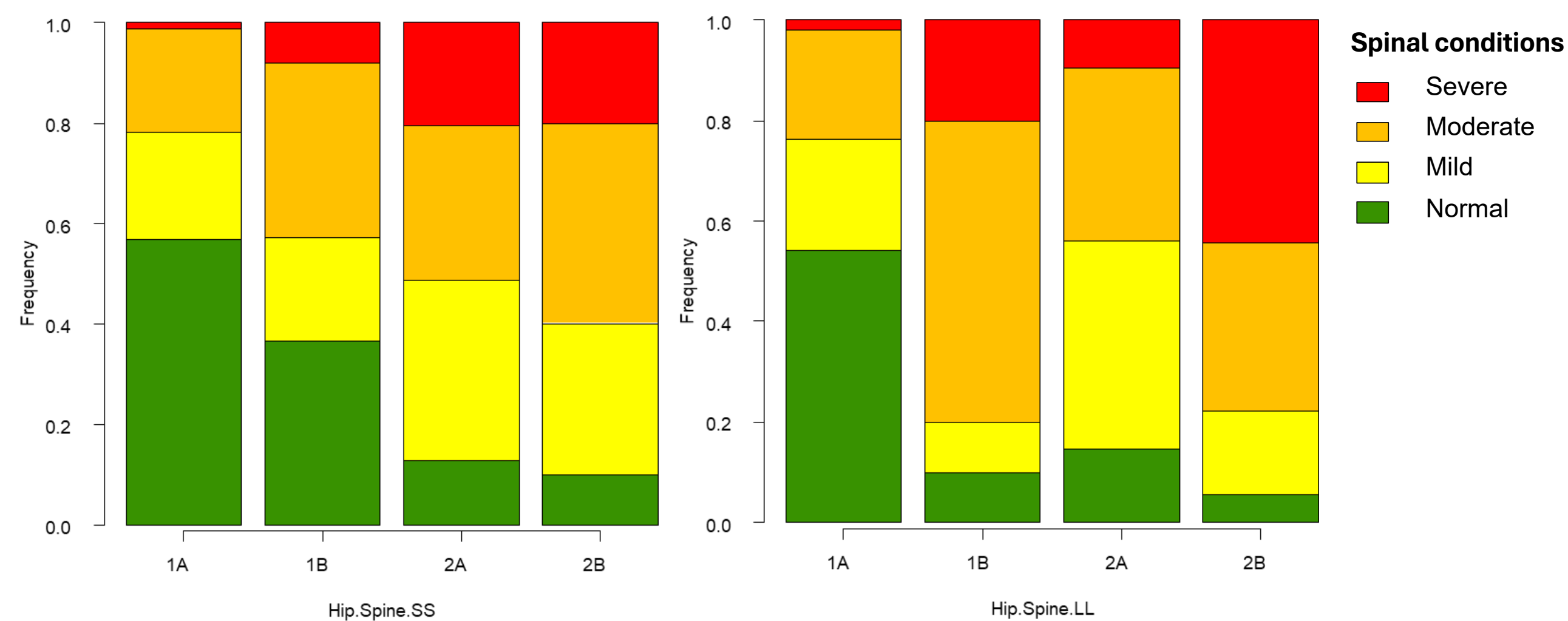


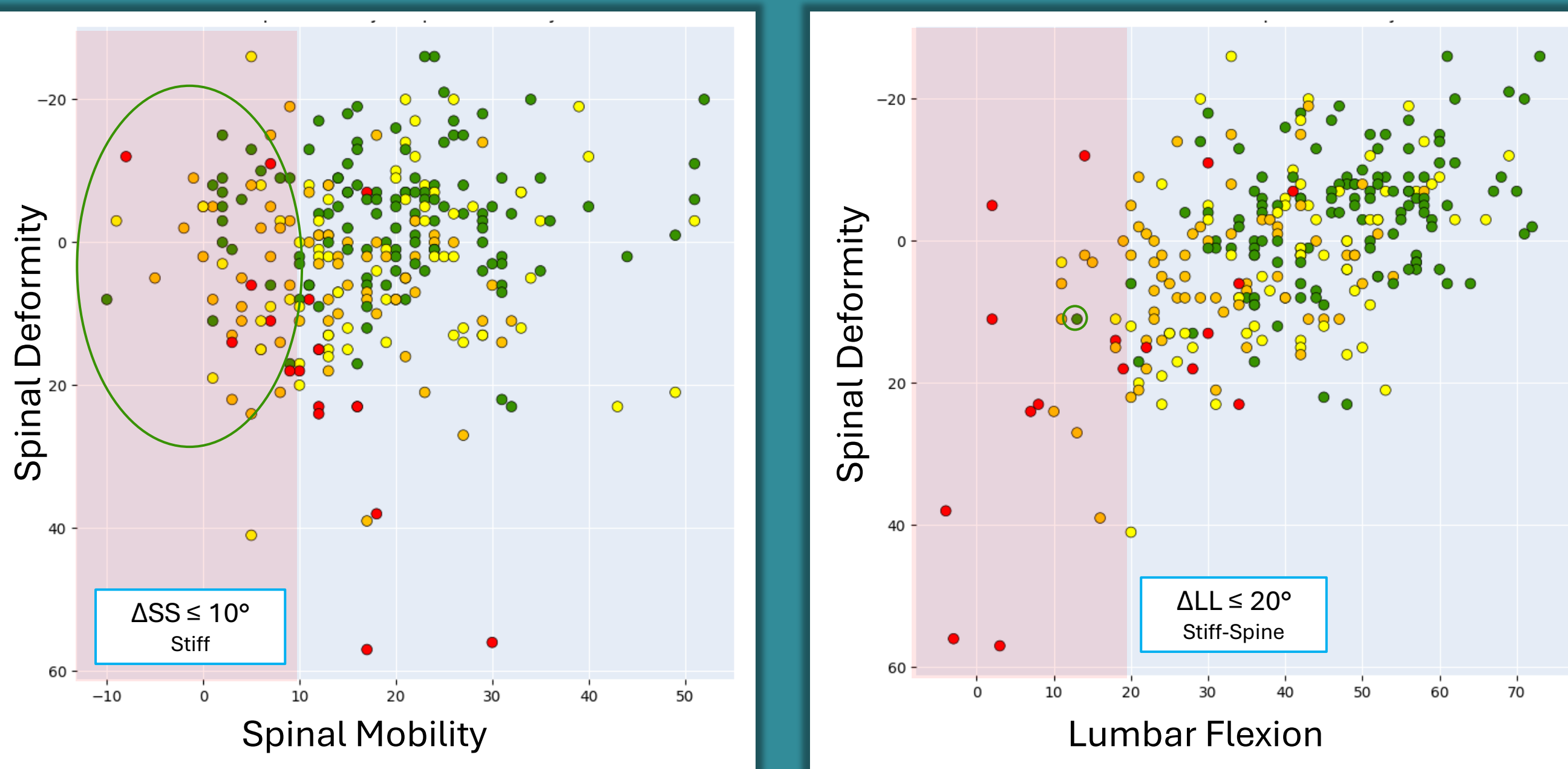
Fig 4: Categorisation of spinal conditions in patients grouped according to their PI-LL and ΔSS (left) or lumbar flexion (right).

Patients with a stiff lumbar spine had a 10.8-fold higher rate of severe spinal disease. Distribution differences were most evident in type 1B, where ΔSS classification more often assigned patients with normal spines.

## CONCLUSION

In general, ΔSS identified more stiff spines than lumbar suggesting that **the SS method may overpredict spinal stiffness.**

The presence of lumbar flexion spinal stiffness was associated with some form of spinal deformity.



## REFERENCES

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