Spinal Deformity Classification

Spinal deformity classifications are frameworks used to categorize complex spinal curvatures based on radiographic, clinical, and etiological parameters. In adult degenerative scoliosis, classification often includes:

1. **SRS-Schwab Classification**: Stratifies deformity using curve type (thoracic, lumbar, double), pelvic incidence-lumbar lordosis mismatch (PI-LL), sagittal vertical axis (SVA), and pelvic tilt (PT).

1. **Coronal Deformity Type**: Refers to curve magnitude and balance in the frontal plane; includes modifiers for main thoracic or lumbar curves.

1. **New Classifications**: The study by Qiu et al. introduces a coronal-specific classification based on:
   1. **C7 Plumb Line orientation** (concave vs convex relative to main curve)
   2. **L4 Coronal Tilt** (< or > 17.5°)

This results in four types (1a, 1b, 2a, 2b) intended to predict postoperative coronal imbalance. Such schemes complement existing sagittal-focused classifications by enhancing coronal plane risk stratification.

In a multicenter retrospective cohort study Qiu et al. from the:

- Peking University Third Hospital, Beijing - Beijing Key Laboratory of Spinal Disease Research, Beijing - Engineering Research Center of Bone and Joint Precision Medicine, Beijing - Qilu Hospital, Cheeloo College of Medicine, Shandong University, Jinan, Shandong - Henan Provincial People's Hospital, Zhengzhou, Henan - Hebei Medical University Third Hospital, Shijiazhuang, Hebei - West China Hospital, Sichuan University, Chengdu, Sichuan - First People's Hospital of Yunnan Province, Kunming, Yunnan - Tianjin Hospital, Tianjin University, Tianjin - First Affiliated Hospital of Nanchang University, Nanchang, Jiangxi :contentReference{index=0} published in the Neurosurgical Focus to investigate risk factors for postoperative coronal imbalance (CIB) in degenerative lumbar scoliosis (DLS) and develop a classification system based on preoperative coronal malalignment (C7PL orientation, L4 coronal tilt) to predict CIB They conclude that a four-type coronal malalignment classification predicts CIB risk: highest in type 2b (convex-side C7PL, L4 tilt > 17.5°; CIB 73%) and lowest in type 1a (concave-side, L4 tilt < 17.5°; CIB 8%). Classification showed good predictive ability (AUC 0.788) :contentReference{index=2} [1].

This study aggressively retrospectively constructs a predictive model from 269 patients across ten centers, but suffers from key limitations:

- **Retrospective design & selection bias**: heterogeneous surgical indications and decision-making unaddressed—could confound classification validity.

- **Measurement reproducibility unclear**: no inter-rater ICC data provided for primary predictors (C7PL, tilt thresholds).

- **Short follow-up window**: only immediate postoperative CIB assessed; no long-term data to confirm persistence or clinical relevance.

- **Threshold generalizability questionable**: L4 tilt cutoff of 17.5° derived from same cohort, risking overfitting. External validation is needed.

- **Clinical outcome missing**: no assessment of pain, function, or quality-of-life in CIB vs balanced groups, limiting translational value.

Final Verdict

Classification is promising but prematurely promoted; lacks validation, outcome correlation, and long-term follow-up.

Takeaway for neurosurgeons

Preoperative convex-side C7PL with L4 tilt >17.5° flags high risk of early postoperative CIB—but surgeons should await prospective validation before changing alignment strategy.

Bottom Line

The Qiu et al. classification stratifies immediate CIB risk but remains unproven; clinical adoption should be cautious pending further validation.

Rating

4/10

References

[1)](#)

Qiu W, Sun Z, Chen Z, et al.* A novel classification of coronal malalignment in degenerative lumbar scoliosis for predicting postoperative coronal imbalance: a multicenter cohort study. *Neurosurg Focus.* 2025 Jun 1;58(6):E4. doi:10.3171/2025.3.FOCUS2524.