

Thoracic Hyperkyphosis: Assessment of the Distal Fusion Level

Kristopher Lundine¹, Peter Turner², Michael Johnson²

- ¹Royal Melbourne Hospital, Melbourne, Victoria, Australia
- ²Department of Orthopaedics, Royal Children's Hospital, Melbourne, Victoria, Australia

Abstract

Study Design This is a retrospective study.

Objective The objective of this study was to assess the sagittal stable vertebra (SSV) versus the first lordotic vertebra (FLV) as the inferior fusion level in patients undergoing spinal surgery for thoracic hyperkyphosis. The main outcome of interest was the development of distal junctional kyphosis (DJK).

Summary of Background Data Prior research has pointed to selection of the FLV for the distal instrumentation level in fusion for thoracic hyperkyphosis. In 2009, Cho et al introduced the concept of the SSV after recognizing the development of DJK despite fusion to the FLV.

Methods Patients were reviewed who had undergone spinal fusion for thoracic hyperkyphosis. Preoperative radiographs were reviewed to assess thoracic kyphosis, lumbar lordosis, SSV, and FLV. Postoperative radiographs were reviewed to assess curve correction and whether patients developed DJK or implant failure.

Results We reviewed 22 patients with a mean age at surgery of 18 (range 14 to 22). Mean preoperative kyphosis was 85 ± 14 degrees, and mean postoperative kyphosis at final follow-up was 59 ± 12 degrees for a mean correction of 26 ± 12 degrees. Eleven patients developed DJK and four patients experienced hardware failure. In 12 patients, the SSV was inferior to the FLV. Rates of DJK when the instrumentation included the SSV or FLV were 13 and 38%, respectively.

Conclusions Fusion to the SSV is superior at preventing DJK when compared with fusion to the FLV.

Keywords

thoracic hyperkyphosis - Scheuermann kyphosis - spinal fusion - sagittal stable - vertebra

胸椎脊柱過度後凸：評估遠端融合節段

研究設計 這是一項回顧性研究。

目的 本研究的目的是評估以矢狀面穩定椎體（SSV）相對以第一脊椎前凸椎體（FLV）作為胸椎脊柱過度後凸患者脊柱外科的遠端融合節段，。本研究關注的結果是遠端交界後凸（DJK）的發展。

背景資料摘要 以往的研究已經指出以選擇 FLV 為胸椎脊柱過度後凸的遠端內固定融合節段。2009 年，Cho et al 在確認儘管融合到 FLV 仍發展 DJK 後，便引進 SSV 的概念。

方法 對胸椎脊柱過度後凸融合患者進行了檢閱。術前 X 光片進行檢閱，以評估胸椎後凸，腰椎前凸，SSV 和 FLV。術後 X 光片進行審閱，以評估患者弧度的改善和患者有否發展 DJK 或植入失敗。

結果 我們檢閱了 22 個病例，手術時的平均年齡為 18 歲（範圍是 14 至 22 歲）。術前脊柱後凸平均為 85 ± 14 度，在最後的跟進時，術後平均後凸為 59 ± 12 度，平均的矯正為 26 ± 12 度。11 名病人發展 DJK 和 4 名病人經歷植入失敗。在 12 名患者中，SSV 是在 FLV 的下方。當內固定手術包括 SSV 或 FLV 時，DJK 的比率分別為 13 和 38%。

結論 在預防 DJK 中，融合至 SSV 相比融合至 FLV 優勝。