

Title. Can Thoracic Inlet Angle Be Used as a Substitute for T1 Slope?

Background. T1 slope is an important radiographic parameter of sagittal spinal balance for surgical planning. However, the T1 superior endplate can be difficult to visualize on radiographs due to overlying anatomical structures.

Research question. This study aimed to investigate the usefulness of preoperative TIA for predicting the development of kyphotic deformity after cervical laminoplasty.

Design. retrospective observational study

Methods. The authors retrospectively extracted data for patients with cervical myelopathy who underwent cervical laminoplasty with a minimum 2-year follow-up. Patients were divided into 2 groups according to the occurrence of postoperative cervical kyphosis. The T1S was measured on a standing radiograph. The TIA is defined as the angle formed by a line from the center of the T1 upper endplate vertical to the T1 upper endplate and a line connecting the center of the T1 upper endplate and the upper end of the sternum. The TIA was evaluated by MRI in a supine position. We examined the correlation analysis between the preoperative T1S and TIA.

Results. A total of 98 patients were enrolled (mean age 73.7 years; 41.8% female). Postoperative kyphosis occurred in 11 patients (11.2%). In the kyphosis group, both preoperative T1S and TIA were smaller compared with the non-kyphosis group (T1S, $23.5^{\circ} \pm 14.5^{\circ}$ vs. $30.3^{\circ} \pm 9.1^{\circ}$, $P = 0.03$; TIA, $76.1^{\circ} \pm 10.2^{\circ}$ vs. $81.8^{\circ} \pm 8.3^{\circ}$, $P = 0.04$). There was a positive correlation between the preoperative T1S and TIA (correlation coefficient, $r = 0.43$; $P < 0.001$).

Discussion. The preoperative TIA showed similar accuracy and reliability as a predictor of postoperative kyphosis compared with the preoperative T1S. The preoperative TIA can be used as a substitute to estimate the T1S when the superior endplate of T1 is not well visualized.