

Interspinous motion

While [interspinous motion](#) analysis is commonly used to determine the status of an [anterior cervical fusion](#), the accuracy of this technique is unclear. Song et al., believed that three questions needed to be answered. What degree of image magnification is ideal? How much motion should be considered “adequate” for making dynamic radiographs? What is the optimal amount of interspinous motion for detecting [pseudarthrosis](#)?

They performed a retrospective study of 125 patients (109 fused segments and 153 pseudarthrotic segments) who had undergone reexploration with confirmation of fusion status. Interspinous motion at each operatively treated level and one superjacent level was measured by two independent investigators twice. Reliabilities of interspinous motion analysis at different magnification rates (25%, 100%, 150%, and 200%) were evaluated for fifty randomly selected segments to determine the optimal magnification, which we used for the remainder of the measurements. Fusion status was also determined on computed tomography (CT) by two other raters. We compared the intraoperative findings with those based on dynamic radiographs (with use of cutoff values of 1 and 2 mm of interspinous motion as the indication of pseudarthrosis) and CT.

On radiographs, both 150% and 200% magnification yielded higher interobserver and intraobserver reliabilities compared with 25% and 100% magnification, and the reliabilities at 150% and 200% were similar to each other, so subsequent measurements were made at 150%. The cutoff value of interspinous motion for detecting pseudarthrosis was 0.9 mm as determined with receiver operating characteristic curve analysis. Compared with CT, interspinous motion of ≥ 1 mm showed relatively low sensitivity (79.5%) and negative predictive value (77.1%) and similar specificity (97.0%) and positive predictive value (97.4%). Using interspinous motion of ≥ 2 mm as the cutoff decreased the sensitivity and negative predictive value to 46.6% and 56.8%, respectively. Our evaluation of what constituted adequate dynamic motion for making the radiographs showed that, with use of interspinous motion of ≥ 1 mm as the cutoff for detecting pseudarthrosis, superjacent interspinous motion of ≥ 4 mm increased the sensitivity and negative predictive value (86.3% and 83.4%) compared with those associated with alternative cutoffs of superjacent interspinous motion (≥ 3.5 , ≥ 5 , and ≥ 6 mm), and the specificity (96.1%) and positive predictive value (96.9%) were reasonable.

Use of interspinous motion of ≥ 1 mm as the cutoff for detection of anterior cervical pseudarthrosis on radiographs magnified 150% and made with superjacent interspinous motion of ≥ 4 mm yielded accuracies comparable with those of CT ¹⁾.

¹⁾

Song KS, Piyaskulkaew C, Chuntarapas T, Buchowski JM, Kim HJ, Park MS, Kang H, Riew KD. Dynamic radiographic criteria for detecting pseudarthrosis following anterior cervical arthrodesis. J Bone Joint Surg Am. 2014 Apr 2;96(7):557-63. doi: 10.2106/JBJS.M.00167. PubMed PMID: 24695922.

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