



RE: Spinal Enumeration by Morphologic Analysis of Spinal Variants: Comparison to Counting in a Cranial-To-Caudal Manner

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Dear Editor,

We have read the article "Spinal Enumeration by Morphologic Analysis of Spinal Variants: Comparison to Counting in a Cranial-To-Caudal Manner" with great interest (1).

When counting the vertebral number using the traditional method (2) under the assumption that there are seven cervical and twelve thoracic vertebrae, we usually apply the segmental variation exclusively to the lumbosacral vertebrae. Although we find the thoracolumbar morphological variants in a significant number of patients, we have no choice but to use the traditional method because it is difficult to perform the morphological analysis of the spine without the computed tomography (CT) images.

In our hospital, when we perform magnetic resonance imaging (MRI) of a spine, we do not always perform spine CT. Commonly, the spine can be examined through the

patient's abdomen or chest CT scans, but in several cases, we count vertebra using both magnetic resonance images and simple radiographic images. We tried to evaluate the vertebral morphology of a thoracolumbar junction by using a simple radiographic examination based on the definition of this study (1, 3), but it was difficult to apply the definition to our practice.

In our hospital, the coronal T2-weighted images are included in the routine spine MRI (Ingenia 3T MRI scanner, Philips Healthcare, Best, the Netherlands) protocol; hence, we tried to review the coronal T2-weighted images (repetition time 3300–3500 msec, echo time 80–100 msec, slice thickness: 3 mm, no slice gap, field of view: 350 x 350 mm) to evaluate the morphology of the thoracolumbar junction. We were able to identify the articulation between a rib and a pedicle or a rib and a vertebral body, which made it possible to distinguish the rib from the transverse process in most coronal images. In order to measure the rib length, if we set the scan range from the anterior body to spinous process of thoracolumbar junctional vertebra, we were able to identify the end of the rib and measure the approximate length. Simple radiography was also useful to measure the length of the whole rib. Therefore, we recommend using coronal T2-weighted images because we found it useful when evaluating the thoracolumbar transitional vertebra (TLTV) without scanning their CT images.

It is certain that applying the morphologic analysis to evaluate a spinal variant can be helpful to understand and communicate the morphologic trait of the transitional vertebrae. However, this method can be difficult to apply to radiology reports practically. When we write reports such as 'acute benign compression fracture in TLTV' and 'central stenosis in TLTV-L1' in a patient with T[12]-TLTV[1]-L[4], can this report be clear and comprehensible to the clinicians? Although the establishment of the first lumbar vertebra based on the morphologic characteristics of thoracolumbar junction is considered a well-organized method, radiologists must be mindful of whether this method will have a positive effect for communication among other clinicians.

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Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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REFERENCES

1. Yun S, Park SY, Park JG, Huh JD, Shin YG, Yun JH. Spinal enumeration by morphologic analysis of spinal variants: comparison to counting in a cranial-to-caudal manner. *Korean J Radiol* 2018;19:1140-1146
 2. Akbar JJ, Weiss KL, Saafir MA, Weiss JL. Rapid MRI detection of vertebral numeric variation. *AJR Am J Roentgenol* 2010;195:465-466
 3. Park SK, Park JG, Kim BS, Huh JD, Kang H. Thoracolumbar junction: morphologic characteristics, various variants and significance. *Br J Radiol* 2016:20150784
1. Yun S, Park SY, Park JG, Huh JD, Shin YG, Yun JH. Spinal