

LETTER

TO THE EDITOR:

Re: Yu CC, Bajwa NS, Toy JO, et al. Pedicle morphometry of upper thoracic vertebrae: an anatomic study of 503 cadaveric specimens. *Spine (Phila Pa 1976)* 2014;39:E1201–9.

We applaud the recent article published by Yu *et al*¹ about the variations in the morphometric characteristics of the thoracic vertebral pedicle with regard to sex, age, ethnicity, weight, and height of the cadavers. The weight and height had not been previously considered in other morphometric studies of the thoracic spine, thus we consider this a very important contribution. Another strength of the study is the large sample size and the knowledge of the information of sex and age of each bone sample included.

It is well known that vertebral morphometric studies represent the basis for planning and execution of spine surgical procedures, as well as for the design and manufacture of pedicle screws. Knowledge of these morphometric characteristics is important to prevent injury to adjacent structures.

However, we think that this study has some important limitations, such as the use of bones more than 70 years old, the lack of a clinical history of individuals belonging to the osteological samples, and a wide disparity in the number of vertebrae in relation to the sex of the involved samples.

Our working group recently published an article whose aim was to determine the variations in morphometric characteristics of thoracic vertebral pedicles (T1–T12) with respect to sex and age. We note some significant variations in the results between the 2 studies.²

In our study, we demonstrated that the thoracic spine pedicle did not show simple linear growth from younger age to older age, but rather, that the changes related to age result in a diameter increase in some age groups and in a decrease in others. These changes may be related to physiological and endocrine changes, nutritional factors, the amount and intensity of physical activity performed by individuals at different stages of life, and osteodegenerative factors.²

The results of our study showed that the dimensions of the thoracic vertebral pedicle were significantly greater in males than in females for all age groups; a finding that matches with the results of this study. However, with respect to variations suffered by the thoracic pedicle with age, in our study we observed that in most cases the vertebral pedicle in males increased in size with increasing age (which coincides with the findings of the study), whereas in females, these dimensions

suffered a significant decrease with increasing age, this possibly related to the loss of the protective factor of estrogens on bone in postmenopausal females, which results in an increase in osteoclastic activity and loss of bone mass.² It is important to note that our study was conducted in samples less than 20 years old, with an epidemiological and clinical record of origin and a proper sample distribution.

We think that a larger number of studies that analyze the variations of the thoracic pedicle according to sex and age are necessary to determine the true behavior of the morphometric characteristics of the thoracic vertebral pedicle to resolve the controversy present in these 2 studies, which are the first of their kind.

Rodolfo Morales-Avalos, MD
Department of Human Anatomy, Faculty of Medicine
Universidad Autonoma de Nuevo Leon (UANL)
Monterrey, Nuevo Leon, Mexico

Félix Vilchez-Cavazos, MD, PhD
Orthopedics and Traumatology Service
“Dr. José Eleuterio González” University Hospital
Universidad Autonoma de Nuevo Leon (UANL)
Monterrey, Nuevo Leon, Mexico

Pedro T. Cortés-González, MD, PhD
Neurosurgery Service, “Dr. José Eleuterio González”
University Hospital, Universidad Autonoma de Nuevo Leon
(UANL), Monterrey, Nuevo Leon, Mexico

Rodrigo E. Elizondo-Omaña, MD, PhD
Santos Guzmán-López, MD, PhD
Department of Human Anatomy, Faculty of Medicine
Universidad Autonoma de Nuevo Leon (UANL)
Monterrey, Nuevo Leon, Mexico

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1. Yu CC, Bajwa NS, Toy JO, et al. Pedicle morphometry of upper thoracic vertebrae: an anatomic study of 503 cadaveric specimens. *Spine (Phila Pa 1976)* 2014;39:E1201–9.
2. Morales-Avalos R, Leyva-Villegas J, Sanchez-Mejorada G, et al. Age- and gender-related variations in morphometric characteristics of thoracic spine pedicle: a study of 4800 pedicles. *Clin Anat* 2014;27:441–50.

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