See Article page XXX.

Commentary: Sarcopenia is not just skeletal muscle loss

Akiko Tanaka, MD, PhD, and
Anthony L. Estrera, MD, FACS

Frailty is now recognized as a predictor of poor outcomes after surgical interventions, including open aortic aneurysm repair.^{1,2} Sarcopenia, depletion of skeletal muscle mass and composition, is a key modifier of frailty.³ Chatterjee and colleagues⁴ report that sarcopenia did not influence operative mortality and mortality during the median follow-up of 2.5 years after thoracoabdominal aortic aneurysm repair in patients aged 60 years and older. The incidence of delayed paraplegia and permanent paraplegia were higher in patients with sarcopenia when compared with patients without sarcopenia.

As the authors suggest, patients with sarcopenia are likely more vulnerable to spinal cord ischemia compared with patients without sarcopenia. They mention the possible underdeveloped microcirculation to explain the pathophysiology. We speculate that these patients likely have poor collateral network for spinal perfusion. Extensive interspinous and paraspinous anastomotic collateral network is important for spinal cord perfusion, which runs in the paraspinal muscle.⁵ Correlation of the paraspinal muscle area and psoas muscle area is well reported. Thus, a sarcopenic patient with small paraspinal muscles mass may be more vulnerable to spinal cord ischemia due to the poorer collateral circulation through the paraspinous anastomoses.

There is no universal definition for sarcopenia—and it has been reported in many ways. The area of both the right and left psoas muscle (ie, total psoas area) measured at the level of L3 or L4 are usually measured, and may be

Akiko Tanaka, MD, PhD, and Anthony L. Estrera, MD, FACS

CENTRAL MESSAGE

Patients with sarcopenia may benefit from both counseling and a tailored plan when undergoing thoracoabdominal aortic aneurysm repair due to concern for high paraplegia rate.

combined with the paraspinal muscle area.⁶ Also, the total psoas area is often indexed by either height (in meters²)—as in the current study—or body by surface area.^{1,2} Further, cutoff values used to define sarcopenia are controversial, which raises a number of questions: Should the number be derived from the healthy, normal population or from the population of interest?; Should the bottom quartile, tertile, or median be used?; and, Should the number be normalized by factors that may affect muscle mass, such as age, sex, and race?

The amount of research on sarcopenia has been increasing at remarkable speed, and due to the fast-aging population, these questions may be answered in the near future. Developing a cutoff number should help identify the patients at risk for adverse postoperative events and provide appropriate preoperative counseling and planning for thoracoabdominal aortic aneurysm repair.

References

1. Ikeno Y, Koide Y, Abe N, Matsueda T, Izawa N, Yamazato T, et al. Impact of sarcopenia on the outcomes of elective total arch replacement in the elderly. *Eur J Cardiothorac Surg*. 2017;51:1135-41.
2. Tanaka A, Sandhu HK, Al Rstum Z, Afifi RO, Miller CC III, Charlton-Ouw KM, et al. Preoperative sarcopenia portends worse outcomes after descending thoracic aortic aneurysm repair. *Ann Thorac Surg*. 2018;106:1333-9.
3. Cesari M, Landi F, Vellas B, Bernabei R, Marzetti E. Sarcopenia and physical frailty: two sides of the same coin. *Front Aging Neurosci*. 2014;6:192.
4. Chatterjee S, Shi A, Yoon L, Green SY, Zhang Q, Amarasekara HS, et al. Effect of sarcopenia on survival and spinal cord deficit outcomes after thoracoabdominal aortic aneurysm repair in patients 60 years of age and older. *J Thorac Cardiovasc Surg*. June 4, 2021 [Epub ahead of print].

From the Department of Cardiothoracic and Vascular Surgery, McGovern Medical School at The University of Texas Health Science Center at Houston, Houston, Tex. Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication June 21, 2021; revisions received June 21, 2021; accepted for publication June 22, 2021.

Address for reprints: Anthony L. Estrera, MD, FACS, Department of Cardiothoracic and Vascular Surgery, McGovern Medical School at UT Health, 6400 Fannin St, Suite 2850, Houston, TX 77030 (E-mail: Anthony.L.Estrera@uth.tmc.edu).

J Thorac Cardiovasc Surg 2021; ■:1-2

0022-5223/\$36.00

Copyright © 2021 by The American Association for Thoracic Surgery

<https://doi.org/10.1016/j.jtcvs.2021.06.044>

5. von Aspern K, Haunschild J, Khachatryan Z, Simoniuk U, Ossmann S, Borger MA, et al. Mapping the collateral network: optimal near-infrared spectroscopy optode placement. *J Thorac Cardiovasc Surg*. August 11, 2020 [Epub ahead of print].
6. Pinto Dos Santos D, Kloeckner R, Koch S, Hoppe-Lotichius M, Zöller D, Toenges G, et al. Sarcopenia as prognostic factor for survival after orthotopic liver transplantation. *Eur J Gastroenterol Hepatol*. 2020;32:626-34.