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AUTHOR'S REPLY

Answer to the Letter to the Editor of V. Kumar et al. concerning "Can standard anterior Smith–Robinson supramanubrial approach be utilized for approach down to T2 or T3?" by Singhatanadgige W, Zebala LP, Luksanapruksa P, Riew KD [Eur Spine J (2017) 26:2357–2362]

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Dear Editor,

We would like to thank the reader for taking interest in our manuscript [*Singhatanadgige W, Zebala LP, Luksanapruksa P, Daniel Riew K (2016) Can standard anterior Smith–Robinson supramanubrial approach be utilized for approach down to T2 or T3? Eur Spine J. doi:* https://doi.org/10.1007/s00586-016-4631-0]. In this study, we evaluated a plain radiographic criterion for determining the feasibility of using the standard anterior Smith–Robinson supramanubrial approach for anterior surgery down to T2 or T3. If a line from the intended skin incision to the lower instrumented vertebrae (LIV) passes over the top of the manubrium, a standard Smith–Robinson approach without sternotomy was successfully used for all 44 patients in our study. Visualization to cervico-thoracic junction and upper thoracic vertebrae is difficult with plain radiographs. However, by adjusting the exposure using digital radiographs, we were able to visualize the cervico-thoracic junction and upper thoracic vertebrae in most cases. We adjusted the exposure back and forth while identifying the LIV by starting from a clearly visualized lower cervical vertebra. We did not attempt to visualize the CTJ using traction or swimmer's views [*Toksoy A, Bektas F, Eken C, Ceken K, Cete Y (2010) Value of the swimming position and arm traction in visualizing the cervicothoracic junction over the standard lateral cervical X-ray. Int J Emerg Med 3:85–90. doi:* https://doi.org/10.1007/s12245-010-0159-y*; Davis JW (1989) Cervical injuries—perils of the swimmer's view: case report. J Trauma 29:891–893*], as our criterion does not require the clear visualization of the vertebra. Even though it may not be perfectly clear on radiographs, our criteria should work, as long as one can draw the line [*Cho W, Buchowski JM, Park Y, Maeda T, Nabb CE, Riew KD (2012) Surgical approach to the cervicothoracic junction: Can a standard Smith–Robinson approach be utilized? J Spinal Disord Tech 25:264–267. doi:* https://doi.org/10.1097/BSD.0b013e31821c2d60].

There were forty degenerative, two trauma and two metastatic cases in our series, all of which were successfully evaluated, using this criteria. The type of pathology is not an issue, using our criteria, since we simply look for the LIV and draw the line from it. Since surgery for all these cases requires fusing to a normal level, the LIV is almost always a normal vertebra.

Using our criterion, we found 100% positive predictive value in 44 cases for determining the ability to successfully operate via a standard Smith–Robinson approach without a sternotomy. We identified the surgical levels intra-operatively using fluoroscopy. To see the LIV, we use a coned-down fluoroscopic shot to allow adequate exposure. Identification of the upper thoracic LIV was done by directly visualizing a clearly identified lower cervical level and counting down to the LIV.

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Compliance with ethical standards

Conflict of interest The manuscript submitted does not contain information about medical device(s)/drug(s). No funds were received in support of this work. No relevant financial activities outside the submitted work.