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Letter to editor regarding: “Vertebral bone quality score independently predicts cage subsidence following transforaminal lumbar interbody fusion.”

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**Letter to editor regarding: “Vertebral bone quality score independently predicts cage subsidence following transforaminal lumbar interbody fusion.”****Daniele Armocida**<sup>1,2</sup>, M.D. PhD student**Luca Proietti**<sup>3,4</sup>, Associate Professor**Alessandro Frati**<sup>2</sup>, Associate Professor

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**LETTER**

In 2022, Soliman et al. [1] published an interesting retrospective study regarding the relationship between poor bone quality, measured by the vertebral bone quality (VBQ) score using magnetic resonance imaging (MRI), and the risk of cage subsidence in transforaminal lumbar interbody fusion (TLIF). The study is intriguing and well-structured, demonstrating how the VBQ score can

independently predict postoperative cage subsidence in patients undergoing TLIF surgery with a simple and well-quantifiable tool. However, we realized that some variables in the study's conceptualization need to be considered in view of the limitations given by a retrospective collection with many missing data (importantly preoperative laboratory values such as parathyroid hormone and vitamin D 25(OH)D). We would like to know the views of the authors.

One aspect that we would like to understand concerns the cage material. In a recent clinical study published in 2020 by Campbell et al. [2], a significant difference between the use of titanium cages versus polyetheretherketone (PEEK) cages was found. The investigation showed titanium cages have lower subsidence rates than PEEK cages in a long follow-up period.

Other authors, on the other hand, report the importance of cage placement relative to the vertebral body [3]. Placement in the posterior third of the body could lead to more pressure on bone with poorer quality), which is also related to the morphology of the end plate [4] and the cage size [5]. Another factor that may come into play in the short-term risk of subsidence concerns the use of expandable cages. Despite its design, debate persists regarding the value of the expandable cage compared with the static cage. Data suggest that using the expandable cage in TLIF significantly increases a patient's risk of postoperative subsidence [6]. We wonder, based on these results before the study in question, if also the fact that the minimally invasive MIS technique could be a confounding factor according to the authors, given that it was used for only 31.3% and 21.4%, respectively, for the groups without and with subsidence.

Subsidence in TLIF is likely a response to a myriad of factors that include but are certainly not limited to vertebral bone quality. The study is well done and easy to reproduce; therefore, we believe it can be widely integrated considering the numerous variables concerning the type of prosthesis, the implant technique, and the materials. In fact, the study took much more into consideration than the patient's clinical parameters and pre-operative medical history.

We therefore ask the authors whether, in their opinion, it is possible that the MRI-VBQ and the related study could also potentially be able to predict not only the radiological event of subsidence but also the symptomatic subsidence phenomena, considering that it was demonstrated that subsidence is not directly related to the clinical deterioration even in osteoporotic patients [7].

Conflict of Interest None.

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