Pull-out

move out from the side of the road, or from its normal position in order to overtake.

Low mineral density at the bone–screw interface significantly weakens pedicle screw fixation among osteoporotic patients, ultimately resulting in screw loosening and loss of secure fixation [1)]

Different screw designs and augmentation techniques are available to overcome this problem. Expandable and cannulated pedicle screws have been designed to increase the pullout force of pedicle screws and have been tested along with polymethylmethacrylate (PMMA) or calcium-based bone substitute augmentation. Design differences in the cannulated portion of screws, which is used to inject PMMA, may affect the pullout force, but direct comparisons have not been published. There are no data on how the design of expandable screws affects the pullout force, and while PMMA augmentation has been used in previous studies, only a few have also evaluated augmentation with calcium-based bone cement.

Pedicle screw pull-out strength

Pedicle screw pull-out strength

1)

Babat LB, McLain RF, Bingaman W, Kalfas I, Young P, Rufo-Smith C. Spinal surgery in patients with Parkinson's disease: construct failure and progressive deformity. Spine (Phila Pa 1976). 2004 Sep 15;29(18):2006-12. doi: 10.1097/01.brs.0000138306.02425.21. PMID: 15371701.