

Determining Optimal C2 Pedicle Screw Placement and Length in Patients with Axis Traumatic Spondylolisthesis: A Case Series

We sought to determine the optimal placement and screw length for C2 pedicle screw fixation to compare with recommendations in literature. Nine patients were included in this study and underwent C2 pedicle instrumentation either for a hangman's fracture as part of C2 pedicle-C3 lateral mass fixation or for C2-C3 subluxation. All nine patients had good postoperative improvement with satisfactory fracture consolidation. Mediolateral and rostrocaudal angulations of the inserted screws were not consistent with the traditional angulations of 20 degrees in each plane due to the fracture lines and the anatomical variations.

Because the frequent observation of the bony anatomical variations and the lines of fractures brought about by trauma, a shift from the classic 20 degrees of angulation in both trajectories has been concluded. But still fixed angles of angulations cannot be generalized. As a consequence, accurate preoperative planning can be obtained by computed tomography with three-dimensional images so that it gives the surgeon a good prediction of the best length of utilized screws in the procedure and the best angulations for safety of the neighboring neurovascular structures.

確定創傷性樞椎滑脫患者的最佳樞椎椎弓根螺釘固定位置和長度：案例系列

我們試圖確定樞椎椎弓根螺釘固定位置和長度，及與文獻的建議作比較。這項研究包括九名患者，他們都因是 Hangman 骨折或 C2-C3 半脫位而進行了樞椎椎弓根內固定，對 Hangman 骨折的患者則是作為樞椎椎弓根-C3 側塊內固定。所有九名患者術後都有良好的改善及滿意的骨折癒合。由於骨折線和解剖上的差異，插入的螺釘在正中側面和 rostrocaudal 的角度都不符合與傳統建議的在每個平面形成 20 度傾角。

基於骨性解剖差異和因創傷所帶來的骨折線的頻繁觀察，結論是在兩個軌跡上都會從典型的 20 度傾角有偏差。但仍不能一概而論定下固定的角度。因此，精確的術前計劃並利用三維的電腦斷層掃描圖像，使外科醫生能預計在手術程序中使用的螺釘的最佳長度和對鄰近神經血管結構安全的最佳角度。