Efficacy of Postoperative Spine Orthosis in the Prevention of Fixation Failure after Surgery for Unstable Thoracolumbar Fractures

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INTRODUCTION:

There is a paucity of data in the literature on the use of postoperative orthosis after surgical stabilization of unstable thoracolumbar injuries. Thoracolumbar orthoses (TLO) have a negligible effect on the intervertebral mobility in the lumbar spine[1]. Additionally, treatment with thoracic and lumbar orthoses has been associated with delay in time to ambulation, muscular atrophy, skin irritation, pressure ulcers, respiratory compromise, increased length of hospital stay, and increased cost to the healthcare system [2-4]. In contrast, some argue that postoperative TLO use may reduce risk of pseudoarthrosis, reduce pain, and decrease risk of instrumentation failure [5,6]. To our knowledge no studies have investigated the efficacy of postoperative TLO use for unstable flexion-distraction or extension type injuries of the thoracolumbar spine (AO thoracolumbar spine fracture types B1, B2, B3 and C).

METHODS:

The institutional Research Electronic Data Capture (REDcap) database was used to identify all adult (age >18 years) trauma patients that underwent posterior spinal fixation and/or instrumented fusion (PSF/PSIF) for unstable thoracolumbar spine injuries by the orthopaedic spine trauma service at a single urban level-1 trauma center between January 2015 and August 2019 . Patients with incomplete clinical records or non-traumatic pathology were excluded. All patients were treated by one of two fellowship trained orthopaedic spine surgeons. Patient data, including AOSpine Thoracolumbar Classification System injury classification, postoperative (TLO) use, and secondary surgeries for fixation or instrumentation failure were recorded for all patients[7]. The primary outcome was failure of instrumentation or fixation requiring surgery for revision instrumentation.

RESULTS: A total of 129 patients met inclusion criteria. There were 5 (3.9%) AO type A3 fractures, 21 (16.3%) type A4 fractures, 13 (10.1%) type B1 fractures, 47 (36.4%) type B2 fractures, 19 (14.7%) type B3 fractures, and 24 (18.6%) type C fractures. Forty-five patients (34.8%) were treated with a TLO postoperatively. Eighty-four (65.1%) patients were treated without a TLO postoperatively. One (2.2%) patient treated with postoperative TLO and one (1.1%) patient treated without postoperative TLO developed fixation failure requiring revision instrumentation (p=0.65).

DISCUSSION AND CONCLUSION:

There is a paucity of data supporting the efficacy of postoperative orthosis use for unstable thoracolumbar spine fractures, specifically the AO type B1, B2, B3, and C injury patterns that comprise the majority (80%) of the patients in this study. Fixation failure requiring revision instrumentation is a rare complication in this population and the difference in failure rate between the TLO and no TLO group was not statistically significant. Given these equivocal results, as well as the morbidity, challenges to rehabilitation, and cost associated with TL orthosis use, surgeons should be judicious in their indications for TLO use after surgical stabilization of thoracolumbar fractures.