Cage versus Tricortical Bone Graft for Anterior Cervical Discectomy and Instrumented Fusion

Background: Outcome of Anterior Cervical Discectomy and Fusion (ACDF) using cage for degenerative spine is well documented, however limited studies available for traumatic sub-axial cervical spine instability.

Research Question: Is the functional outcome of cage and autologous graft for instrumented anterior cervical interbody fusion for traumatic instability different?

Design: Randomized controlled trial

Methods: Patients ≥18 years with traumatic single level sub-axial cervical spine instability were randomized into fusion using tricortical autograft (n=16) and titanium cage (n=16) and followed at 2, 6, 12, 24 and 52 weeks for clinico-radiological assessment of union and functional assessment.

Results: Age distribution(p=0.18), gender distribution(p=0.23), mode of injury(p=1.00), level of injury(p=0.64), Frankel grading(p=0.39) were similar for the groups. Mean age(yrs.) and mean time of presentation(hrs.) after injury were 49.68±10.38 and 28±25.71 respectively for tricortical graft and 42.78±9.99 and 25.37±25.69 for cage group (p=0.07 and p=0.78 respectively).

Injury to surgery duration(days), duration of surgery(min.), blood loss(ml.) and hospital stay(days) were 7.88±5.85, 169.40±30.87, 171.25±31.81 and 11.38±3.67 respectively in tricortical graft group while they were 7.19±4.04, 175.00±30.55, 171.87±22.86 and 11.19±4.02 for cage with graft group (p=0.702, p=0.608, p=0.950 and p=0.891 respectively). Tricortical graft group had superficial infection and graft site pain 1 each while cage group has CSF leak and persistent neck pain 1 each. Radiological union and clinical improvement (Frankel grade) were similar(p>0.05). Neck pain (VAS score) was 2.88 ± 0.88 and 3.067±0.96 for tricortical graft group and cage group respectively(p=0.52).

Discussion: We found no significant difference in operating time, union time, pain (VAS) and neurological outcomes (Frankel Grade) between cage and autologous tricortical bone graft in ACDF for traumatic sub-axial cervical spine injury.

Keywords: Anterior spine surgery, fusion, cage, tricortical graft, functional outcome