

Author Year Country Research Design Score Total Sample Size	Methods	Outcome
<p>Razaq et al. (2018) Pakistan Case Series N=149</p>	<p>Population: Mean age=32±13.1 yr; Gender: male=117, female=32; Level of injury: C3–C4=3, C4–C5=2, C5–C6=7, C6–C7=7, C7–T1=1; Severity of injury: ASIA A=65, B=12, C=59, D=13. Intervention: A retrospective review to assess neurological recovery in terms of ASIA grading in individuals with traumatic SCI. Outcome measures were assessed preoperatively and at six mo follow-up. Outcome measures: Cause of injury; ASIA score. Chronicity: All participants were operated on within 24 hr after injury.</p>	<ol style="list-style-type: none"> 1. The majority of individuals presented with fall (64.4%), while the remainder presented with motor vehicular accidents (35.6%). 2. The AISA grading at six mo was ASIA A=40.9%, B=2.7%, C=17.4%, D=22.1%, E=16.8%. 3. Overall neurological improvement was observed in 45% of individuals. 4. Improvement of one ASIA grade was observed in 32.9% of individuals, while a two-grade improvement was observed in 11.4% of individuals and three grades in 7%.
<p>Abdel Fatah (2017) Egypt Case Series N=53</p>	<p>Population: Mean age=39.4 yr; Gender: male=22, female=31; Level of injury: T10=4, T11=7, T12=31, L1=11; Severity of injury: AISA A=6, B=18, C=29. Intervention: A retrospective review of walking recovery after surgical management of traumatic burst fractures at the thoracolumbar junction in paraplegic individuals. Outcome measures: Walking ability. Chronicity: The mean time from injury to surgical intervention was 9.3 hr and the mean length of hospital stay was 21.6 days.</p>	<ol style="list-style-type: none"> 1. All individuals with L1 fracture and 70.96% of individuals with T12 fracture regained the ability to walk, however, all the individuals with T10 and T11 fractures did not regain walking ability 12 mo after surgery. 1. The severity of SCI and walking ability was related to the spinal level of fracture.
<p>Park et al. 2017 Korea Case Series N=73</p>	<p>Population: Mean age=44.2 yr; Gender: male=58, female=15; Level of injury: C2–C7; Severity of injury: AISA A-D. Intervention: A retrospective review of the prognostic factors affecting the outcomes of decompression surgery in individuals with SCI. Outcome measures: Early intervention; Sex; Age; Surgical level; American Spinal Injury Association (ASIA) score; Blood Pressure (BP); Mean Arterial Pressure (MAP); Cord compression; Steroid use; Surgery time; Estimated blood loss measured after surgery and at 3 mo.</p>	<ol style="list-style-type: none"> 1. The MAP, AIS before surgery and BP were significant prognostic factors affecting recovery in the immediate post-operative period ($p<0.001$, $p=0.033$, $p=0.004$), while early decompression, sex, age, surgical level, maximal cord compression, use of steroids, surgery time and EBL were not significant ($p>0.05$). 2. In the late recovery period, three mo after surgery, the AIS before surgery, BP, and MAP were significant prognostic factors affecting recovery ($p=0.006$, $p=0.004$, $p=0.003$), while early decompression, sex, age, surgical level, maximal cord compression, use of steroids, surgery time, and EBL were not significant ($p>0.05$).

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	Chronicity: The mean time from injury to surgery and length of hospital stay was not reported.	
Konomi et al. (2018) Japan Case Control N=78	Population: Mean age=67 yr; Gender: male=66, female=12; Level of injury: C3–C6; Severity of injury: Not reported. Intervention: The effectiveness of decompression surgery for individuals with traumatic cervical SCI and pre-existing cord compression $\geq 40\%$ (n=32) or $< 40\%$ (n=46) was compared. Outcome measures: American Spinal Injury Association (ASIA) score; Barthel index; SCIM. Chronicity: Individuals underwent surgery on average 27 days after injury. The mean duration of hospital stay was 46 days.	<ol style="list-style-type: none"> 1. In the severe compression group ($\geq 40\%$), AIS grade improvement > 2 was observed in 30% of individuals with surgical treatment, although it was not observed in any individual without surgery. 2. SCIM improvement rate at discharge was 60% in the surgical group and 20% in the non-surgical treatment group. 3. In the minor compression group ($< 40\%$), AIS grade improvement > 2 was observed in 18% of individuals with surgical treatment and 11% without surgery. 4. The SCIM improvement rate at discharge was 52% in the surgical treatment group and 43% in the non-surgical treatment group.
Biglari et al. (2016) Germany Cohort N=51	Population: <i>Early intervention (n=29):</i> Mean age=38.2 \pm 17.9 yr; Gender: male=25, female=4; Level of injury: cervical=12, thoracic=10, lumbar=7; Severity of injury: AISA A=13, B=8, C=7, D=1. <i>Late intervention (n=22):</i> Mean age=50.2 \pm 18.9 yr; Gender: male=15, female=7; Level of injury: cervical=10, thoracic=6, lumbar=6; Severity of injury: AISA A=11, B=3, C=4; D=4. Intervention: Individuals with SCI received early (within the first four hr) or late (between four and 24 hr) surgical decompression to determine if either improves neurological outcomes. Outcome measures were assessed at the time of admission and 6 mo after trauma or longer depending on the time of release. Outcome measures: American Spinal Injury Association (ASIA) score. Chronicity: All individuals received early stabilization and decompression within 24 hr.	<ol style="list-style-type: none"> 2. No significant difference in neurologic function, measured with ASIA score, was found between cohorts (p>0.05).
Kreinest et al. (2016) Germany Case Series	Population: Mean age=50.5 \pm 21.2 yr; Gender: male=104, female=29; Level of injury: C3–L4; Severity of injury: not reported.	<ol style="list-style-type: none"> 1. Motor function improved from 51.5\pm24.8 to 60.1\pm25 (improvement: 25.7%).

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<p>N=133</p>	<p>Intervention: A retrospective review to analyze the influence of previous comorbidities and common complications on motor function outcome in individuals with traumatic spinal cord injury that received early surgical intervention.</p> <p>Outcome measures: Motor function; Complications.</p> <p>Chronicity: The mean time from injury to surgery was 22.1±56.6 hr. The mean length of hospital stay was 122.8±100.4 days.</p>	<ol style="list-style-type: none"> 2. The most common complications were urinary tract infection and pneumonia. 3. A significant relationship between a lack of previous spinal comorbidities and increased motor function was observed ($p<0.05$). 4. No other comorbidities or complications showed a significant effect on motor function outcome.
<p>Jug et al. (2015) Slovenia Cohort N=48</p>	<p>Population: <i>Early intervention (n=26):</i> Mean age=44 yr; Gender: male=18, female=8; Level of injury: C3–C4=1, C4–C5=4, C5–C6=5, C6–C7=10, C7–T1=2; Severity of injury: AISA A=13, B=5, C=4.</p> <p><i>Late intervention (n=22):</i> Mean age=52 yr; Gender: male=16, female=6; Level of injury: C3–C4=3, C4–C5=2, C5–C6=7, C6–C7=7, C7–T1=1; Severity of injury: AISA A=4, B=1, C=15.</p> <p>Intervention: Individuals with SCI received surgical decompression and instrumented fusion early (within 8 hr) or late (between eight and 24 hr) after injury to determine if either improves neurological outcomes. Outcome measures were assessed at baseline and at six mo follow up.</p> <p>Outcome measures: American Spinal Injury Association (ASIA) score; Complications.</p> <p>Chronicity: All individuals received early stabilization and decompression within 24 hr.</p>	<ol style="list-style-type: none"> 1. At the six mo follow up, a significant improvement of at least two AIS grades was found in 45.5% of individuals in the early intervention compared to 10% of the late intervention cohort ($p=0.017$). 2. A significant improvement in ASIA motor score was found in the early intervention (38.5) compared to the late (15.0) ($p=0.0468$). 3. The odds of an at least two-grade AIS improvement were 106% higher for individuals in the early intervention than for individuals in the late intervention ($OR=11.08$, $p=0.004$). 4. No significant differences in rate of complications was found between cohorts.
<p>Lehre et al. (2015) Norway Case Series N=146</p>	<p>Population: Mean age=31.7 yr; Gender: male=129, female=17; Level of injury: lumbar=60, cervical=50, thoracic=32, combined=4; Severity of injury: AISA A=32.2%, B/C/D=46.6%, E=21.2%.</p> <p>Intervention: A retrospective review of outcomes after surgical treatment for SCI.</p> <p>Outcome measures: Mortality; Neurological status; Quality of life; Complications.</p> <p>Chronicity: Not reported.</p>	<ol style="list-style-type: none"> 1. Twenty-five individuals (17.1%) were confirmed dead and 85 individuals (58.2%) were alive. 2. Eight out of 47 individuals (17%) with a complete injury and 29 out of 68 individuals (42.6%) with an incomplete injury showed neurological improvement. 3. The reported incidences of pressure wounds, recurrent urinary tract infections, pneumonia, and thromboembolic events were 22.5%, 13.5%, 5.6% and 1.1% respectively. 4. No significant differences were observed in quality of life.

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<p>Kawano et al. (2010) Japan Prospective Control Trial N=54</p>	<p>Population: <i>Surgery (SG, n=17)</i>: Mean age: 61.4 yr; Gender: males=11, females=6; Level of injury range: C3-C6; Level of severity: AIS B=3, C=14. <i>Conservative Compression (CC, n=17)</i>: Mean age: 64.6 yr; Gender: males=15, females=2; Level of injury range: C3-C6; Level of severity: AIS B=5, C=12. <i>Conservative Mild Compression (MC, n=20)</i>: Mean age: 61.3 yr; Gender: males=18, females=2; Level of injury range: C3-C6; Level of severity: AIS B=4, C=16. Intervention: Individuals with cervical spinal cord compression without bone and disc injury were assigned to either a surgical treatment group or a conservative treatment group. Outcomes were assessed at baseline, 2 wk, 3 mo, 6 mo, and 1 yr after injury. Outcome Measures: American Spinal Injury Association (ASIA) Motor Score.</p>	<ol style="list-style-type: none"> The mean ASIA motor scores were 25.1 points (SG) and 27.1 (CC), at the time of admission; 41.0 (SG), 42.5 (CC), at 2 wk; 61.8 (SG), 61.2 (CC), at 3 mo; 64.2 (SG), 63.0 (CC), at 6 mo; 65.1 (SG), 64.1 (CC), at 1 yr. There was no significant difference in the recovery process. The mean ASIA motor score of the MC group was 25.0 at admission, 38.3 at 2 wk, 60.8 at 3 mo, 64.0 at 6 mo, and 64.9 at 1 yr. Not significantly different from the SG or CC groups.
<p>Singhal et al. (2008) UK Case Series N_{Initial}=57, N_{Final}=37</p>	<p>Population: Mean age: 40.8 yr; Gender: males=43, females=14; Injury etiology: motor vehicle accident=17, fall=15, sports=2, assaults=2; Level of injury: C2-C7; Level of severity: Frankel B=25, C=7, D=5. Intervention: Individuals with traumatic cervical SCI who underwent surgery were retrospectively analyzed. Follow-up time was >12 mo. Outcome Measures: Frankel Grade.</p>	<ol style="list-style-type: none"> Of the 25 individuals with Frankel Grade B, 14 improved to C, six improved to D, and five remained the same. Of the seven individuals with Frankel Grade C, all improved to D. Of the five individuals with Frankel Grade D, one improved to E and four remained the same.
<p>McKinley et al. (2004) USA Case Series N=54</p>	<p>Population: <i>Nonsurgical (NS, n=176)</i>: Mean age: 42.8 yr; Gender: males=149, females=27; Injury etiology: motor vehicle accident=89, falls=52, sports=7, medical complication=17, violence=2, other=9; Level of severity: incomplete paraplegia=34, complete paraplegia=34, incomplete tetraplegia=73, complete tetraplegia=35. <i>Early Surgical (ES, n=307)</i>: Mean age: 36.7 yr; Gender: males=228, females=79; Injury etiology: motor vehicle accident=175, falls=75, sports=29, medical complication=4, violence=3, other=21; Level of severity: incomplete paraplegia=65, complete</p>	<ol style="list-style-type: none"> ASIA motor score improvements were significantly greater in the NS group compared to both the ES and LS groups (p<0.05). The LS group had significantly (p<0.05) increased acute care and total LOS and hospital cost along with higher incidence of pneumonia and atelectasis. There was no significant difference between groups in neurologic levels, AIS grade, or FIM motor efficiency (all p>0.05).

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	<p>paraplegia=93, incomplete tetraplegia=82, complete tetraplegia=67; Time since injury range: <72 hr. <i>Late Surgical (LS, n=296)</i>: Mean age: 35.6 yr; Gender: males=237, females=59; Injury etiology: motor vehicle accident=148, falls=93, sports=35, medical complication=1, violence=3, other=16; Level of severity: incomplete paraplegia=40, complete paraplegia=85, incomplete tetraplegia=101, complete tetraplegia=70; Time since injury range: >72 hr.</p> <p>Intervention: Individuals with spinal cord injury were retrospectively analyzed based on timing of surgery. Outcomes were assessed at baseline and 1 yr after injury.</p> <p>Outcome Measures: American Spinal Injury Association (ASIA) Motor Score, Length of Stay (LOS), Cost, Complications, Neurologic Levels, AIS Grade, Functional Independence Measure (FIM) Motor.</p>	