INTEROBSERVER AND INTRAOBSERVER RELIABILITY OF SUB-AXIAL INJURY CLASSIFICATION AND SEVERITY SCALE BETWEEN RADIOLOGIST, RESIDENT AND SPINE SURGEON

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Backgrounds and Aim

- The sub-axial Injury Classification (SLIC) and Severity Scale successfully launched to help spine surgeon to classify sub-axial spine injury.
- To determine whether the SLIC and Severity Scale can be common evaluation tools between radiologist, resident and spine surgeon is very important for universal application.
- To evaluate reliability of a SLIC to radiologist and residents as well as spine surgeon.
Materials

• Retrospective Cohort
• 95 cases of subaxial spine injury who already underwent operation were included in this study.
• 20 cases which were difficult to evaluate due to poor quality radiological findings was dropped out.
Methods

- Three observers (Spine surgeon, Resident, and Radiologist) selected for study
- Repeated 2 times per each physicians after 10 times practice in common case
- Cronbach’s Alpha statistics for interobserver and intraobserver reliability.
Morphology (0-4)

No abnormality: 0

Compression: 1

Burst: 2

Distraction: 3

Translation: 4

facet D/L, unstable tear drop
Disco-ligamentous complex (DLC: 0-2)

No abnormality: 0
Intermediate: 1
MRI signal change, interspinous widening
Disrupted: 2
widening disc space, facet perch
# Neurological Status (0-4)

- **Intact**: 0
- **Root injury**: 1
- **Complete cord injury**: 2
- **Incomplete cord injury**: 3
- **Continuous cord compression in setting of neuro deficit**: 4

**SLIC total score**
- 0-3: non-operation
- 4: observation or operation
- 5: surgery
Intraobserver agreements

<table>
<thead>
<tr>
<th></th>
<th>Spine Surgeon</th>
<th>Radiologist</th>
<th>Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphology</td>
<td>87.5%</td>
<td>82.6%</td>
<td>80.7%</td>
</tr>
<tr>
<td>DLC</td>
<td>88.1%</td>
<td>86.2%</td>
<td>77.9%</td>
</tr>
<tr>
<td>Neurology</td>
<td>80.8%</td>
<td>79.2%</td>
<td>81.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>84.6%</strong></td>
<td><strong>85%</strong></td>
<td><strong>85.4%</strong></td>
</tr>
</tbody>
</table>
## Interobserver reliability

<table>
<thead>
<tr>
<th>SLIC</th>
<th>Spine surgeon Vs Radiologist</th>
<th>Spine surgeon Vs Resident</th>
<th>Radiologist Vs Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morphology</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>74%</td>
<td>78.6%</td>
<td>80.6%</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>76.4%</td>
<td>76.7%</td>
<td>77.1%</td>
</tr>
<tr>
<td><strong>DLC</strong></td>
<td></td>
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</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>68.9%</td>
<td>73.1%</td>
<td>64.3%</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>64.8%</td>
<td>72.4%</td>
<td>68.9%</td>
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<tr>
<td><strong>Neurology</strong></td>
<td></td>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>84.5%</td>
<td>89.2%</td>
<td>85.9%</td>
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<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>79.4%</td>
<td>85.4%</td>
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<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>70.9%</td>
<td>75.5%</td>
<td>74%</td>
</tr>
</tbody>
</table>
Summary of data

- Interobserver reliability
  - Morphology
    • 77.8%
  - Disc-ligament complex
    • 68.7%
  - Neurology
    • 86.5%
  - Total SLIC score
    • 74%

*M: Morphology, D: Disc-ligament complex, N: Neurology, T: Total score

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Conclusion

• SLIC and Severity scale is comprehensive and easily applicable with sufficient reproducibility.
• It can be used common communication tools between residents, radiologists and spine surgeons.
Thank you very much!

Nothing disclosure