

# SLIC and Allen Classification as Predictors of Injury Severity in Teardrop Fractures

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#### Introduction

Teardrop fractures result in severe neurologic dysfunction and gross spinal instability. The Allen's mechanistic classification is based on fracture pattern, however, The Subaxial Injury Classification and Severity score (SLIC) considers not only morphology but also the integrity of the discoligamentous complex and the neurologic status of the patient. We sought to correlate these classification systems with severity of neurologic injury.



Allen & Ferguson stages of compressive flexion injury. Adapted from Bono, 2006.

# Methods

The demographics, imaging studies, and acute care data of 72 symptomatic spinal cord injury patients with tear drop fractures were analyzed over an 11 year period (2001-2012). Morphology systems of Allen and SLIC Classifications were correlated with ASIA Motor Score (AMS), ASIA Impairment Scale (AIS), length of lesion on T2W MRI, Maximum Spinal Cord Compression (MSCC) and Maximum Canal Compromise (MCC). **Bivariate and multivariate** analyses were performed to validate the relationship of morphology and the above mentioned covariates.



Calculations & Measurements for MCC, MSCC, & Lesion Length

SLIC Classification	
	Points
Morphology	
No abnormality	0
Compression	1
Burst	+1 = 2
Distraction (e.g., facet perch, hyperextension)	3
Rotation/translation (e.g., facet dislocation,	4
unstable teardrop or advanced staged	
flexion compression injury)	
Disco-ligamentous complex (DLC)	
Intact	0
Indeterminate (e.g., isolated interspinous	1
widening, MRI signal change only)	
Disrupted (e.g., widening of disc space,	2
facet perch or dislocation)	
Neurological status	
Intact	0
Root injury	1
Complete cord injury	2
Incomplete cord injury	3
Continuous cord compression in setting of neuro deficit (Neuro Modifier)	+1

From Vaccaro et. al. 2007

#### Results

The mean age was 28 years, 87% of patients were male and MVC was the most common cause (35%) followed by sports (32%), falls (21%) and other (12%). The mean admission ASIA motor score was 34, 55% had ASIA A, 13% ASIA B, 7% ASIA C, 23% ASIA D, and 3% ASIA E Impairment Scales. Allen classification was significantly associated with ASIA motor score (P<0.0074), AIS (p<0.039), lesion length (p < 0.0006), MCC (p<0.0011), and MSCC (p<0.003). This relationship was less evident in the SLIC scoring system.

Gender-male: number (%)	62 (87.3
Age (years): mean (SD)	27.6 (12.)
Mech of Injury: number (%)	
Motor vehicle accident	25 (35.2
Falls	15 (21.1
Sports	23 (32.4)
Other	8 (11.3)
AIS: number (%)	
Grade A	39 (54.9)
Grade B	9 (12.7)
Grade C	5 (7.0)
Grade D	16 (22.5
Grade E	2 (2.8)
Injury level: number (%)	
C3	1 (1.4)
C4	4 (5.6)
C5	46 (64.8)
C6	14 (19.7)
C7	5 (7.0)
T1	1 (1.4)
CF Stage: number (%)	
CF 3	9 (12.7)
CF 4	21 (29.6)
CF 5	41 (57.8)
AMS: mean (SD)	34.1 (32.5
SLIC score: mean (SD)	8.4 (1.1)
Lesion length(mm): mean (SD)	44.4 (21.3
MCCs: mean (SD)	38.5 (15.9
	-0.0 (10.1

## Conclusions

In this study Allen's Mechanistic Classification phylogeny of compressive flexion Injury, particularly stages 3-5, significantly reflected injury severity which was not clearly evident in the SLIC Classification.

## References

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## **Learning Objectives**

By the conclusion of this session participants should be able to: 1) Understand the uses and differences between the Allen classification and SLIC. 2) Apply these classification systems to cervical traumatic injuries. 3) Understand the relationships between these classification systems and injury severity.