

2022 NEHS Annual Meeting Abstract Submission

COMPLETE

NEHS Vice President, Daniel Mastella, M.D., is currently accepting abstract submissions for presentation at our Annual Meeting on December 2, 2022.

This meeting will be held at the Sturbridge Host Hotel in Sturbridge, MA.

Therapists, NPs, and PAs are also encouraged to submit.

THE DEADLINE FOR SUBMISSION IS OCTOBER 15, 2022

RESIDENTS AND FELLOWS ONLY. Please indicate if you want your paper to be considered for the prestigious H.Kirk Watson, M.D. Founder's Award. The abstracts for award consideration will be presented in the morning and the award will be presented in the afternoon.

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* ABSTRACT TITLE

Soong Classification Using X-Rays Only Moderately Correlates with Distal Radius Plate Position on Computed Tomography

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* Name of who will present abstract at NEHS meeting on December 2, 2022 Please note that the same person cannot present more than one abstract at the meeting.

Rachel Cross

* Please indicate if the presenter is:

Not currently a resident or fellow

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*** ABSTRACT - should include background information and a description of methods, programs, or practices.**

Hypothesis: The Soong classification grades the prominence of volar locking plates used to treat distal radius fractures in relation to the volar rim. The basis of the classification scheme was that increasing plate prominence over the volar rim and distal radius watershed zone would be associated with injuries of the flexor tendons and increased need for plate removal. Recent studies, however, report mixed results on the predictive value of the Soong classification for these outcomes. We hypothesized this misclassification is secondary to a suboptimal correlation between the Soong classification on radiographs (XR) and computed tomography (CT).

Methods: Fifty distal radius fractures treated by volar locking plate, collected from the international collaborative, publicly available ICUC database, were reviewed. All cases with a postoperative XR and CT were included. Soong classification of the volar locking plate to the volar ulnar rim was determined on both modalities by two independent, fellowship-trained hand surgeons, using CT imaging as the gold standard. The distribution of Soong grades on XR and CT was compared using Pearson's chi-square test, and correlation was calculated using the Matthews' correlation coefficient (MCC). A multi-class confusion matrix was used to calculate each grade's positive predictive value (PPV).

Results: The distribution of Soong grades was significantly different when using XR versus CT ($p < 0.001$, Table 1). We found an MCC of 0.65 indicating only moderate correlation between the two modalities. Per individual Soong grade, the PPV was the highest for grade 2 (0.96), with lower PPVs for grade 0 (0.63) and grade 1 (0.60).

Summary Points:

- The Soong classification demonstrates only moderate correlation between grades based on radiograph and CT.
- Although grade 2 was reliably established on both modalities, grades 1 and 0 have a lower positive predictive value when graded using radiographs.
- Radiographs may be less suitable to distinguish between Soong grades 1 and 0, and thus the subsequent risks of volar plate prominence may be underestimated on radiographs compared to CT.
- Further study of the value of postoperative CT imaging in predicting plate-related complications is needed.

Please attach files with diagrams and/or photos to support your abstract (10 MB limit)

soong_tables.docx

*** Please attach the abstract presenter's CV**

rachelcross_cv.pdf

Table 1: Demographics	
Age in years, median (IQR)*	60 (55 - 70)
Follow-up in weeks, median (IQR)**	81 (32 - 189)
Male, n (%)	10 (20.8)
AO classification	
23-A, n (%)	5 (10)
23-B, n (%)	13 (26)
23-C, n (%)	32 (64)

* Age was available in multitudes of 5 years

** N = 48

Table 1. Demographic and Diagnostic Information of Included Patients.

Table 2: Correlation of Soong Grades on Radiograph and CT					
	Soong grade CT				
		0	1	2	Total
Soong grade radiograph	0	<i>10</i>	3	3	16
	1	2	<i>6</i>	2	10
	2	1	0	<i>23</i>	24
	Total	13	9	28	50
Positive predictive value per Soong grade					
Grade 0	0.63				
Grade 1	0.60				
Grade 2	0.96				
Correlation coefficients					
Pearson's chi	P < 0.001				
Matthew's correlation coefficient	0.65				

Italic font indicates agreement between radiographs and CT

Table 2. Correlation of Soong Grades on Radiograph and CT Imaging.

Table 3: Clinical Outcomes

Variable	Value
Flexion degrees, median (IQR)	71.9 (62.0 - 78.7)
Extension degrees, median (IQR)	80.4 (74.2 - 85.1)
Supination degrees, median (IQR)	87.0 (83.8 - 90.0)
Pronation degrees, median (IQR)	86.4 (81.2 - 90.0)
Radiographic union at final follow-up, n (%)	50 (100)
Complication, n (%)	2 (4.00)

Table 3. Clinical Outcomes from Treatment with a VLP.