

2023 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 1, 2023.

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, 2023

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

Factors Associated with Loss of Reduction of Volar Ulnar Rim Fragments following Volar Locking Plate Fixation of Intra-articular Distal Radius Fractures

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*** Name of who will present abstract at NEHS meeting on December 1, 2023 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

*** List full names of abstract authors Please note - one of the lead authors must be present at the meeting to answer questions about the paper.**

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

Hypothesis: To assess factors associated with loss of reduction of volar ulnar fragments following volar locking plate (VLP) fixation of intra-articular distal radius fractures. We hypothesized that volar ulnar fragment (VUF) size and plate placement would be critical variables driving the incidence of volar rim loss of reduction.

Methods: All patients with a volarly displaced, intra-articular distal radius fracture treated with a VLP within the ICUC database, an international collaborative and publicly available dataset, were identified. The primary outcome was volar rim loss of reduction on follow-up imaging, defined as a change in radiographic alignment from intra-operative fluoroscopy, teardrop angle less than 50 degrees, or loss of normal radiocarpal alignment. Secondary outcomes were final range of motion (ROM) of the affected extremity. Radiographic Soong classification was used to grade plate position. Traditional descriptive statistics were used to compare patient, fracture, and treatment characteristics with volar rim loss of reduction. A Random Forest supervised machine learning algorithm was used to classify variable importance for predicting the primary outcome.

Results and Conclusion: Fifty patients with volarly displaced, intra-articular distal radius fractures treated with VLP were identified. Six patients were observed to have a volar rim loss of reduction, but none required reoperation. Volar ulnar fragment size, Soong grade 0, and post-fixation axial plate position in relation to the sigmoid notch were significantly associated ($p < 0.05$) with volar rim loss of reduction. All cases of volar rim loss of reduction occurred when VUF was 10.8 mm or less. The size of the VUF was the most important variable for predicting volar rim loss of reduction, followed by post-fixation axial plate position in relation to the sigmoid notch and the number of volar fragments in the Random Forest machine learning algorithm.

Summary:

- Size of the volar ulnar fragment was the variable classified as having the most importance for volar rim reduction loss after VLP and occurred when the size was less than 10.8 mm.
- Variables significantly associated ($p < 0.05$) with volar rim reduction loss include volar ulnar fragment size, Soong grade 0, and post-fixation axial plate position in relation to the sigmoid notch.
- Fracture characteristics can influence the treatment approach to address these risk factors.

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

volar_rim_loss_figure_1.png

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

Figure 1: Assessment of variable importance for predicting volar rim loss of reduction using Random Forest supervised machine learning algorithm

