

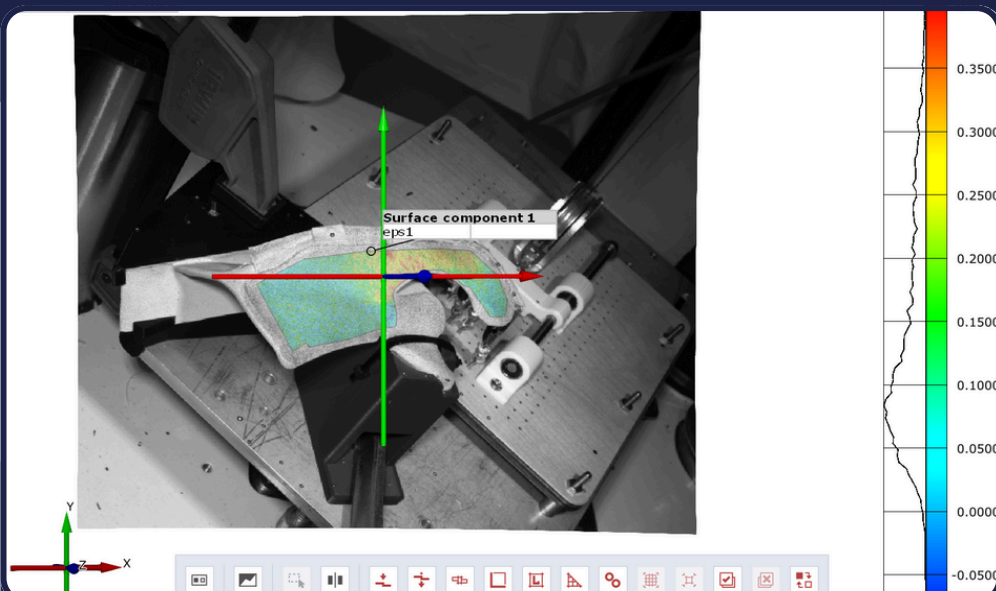
Acromial Fracture Testing and Analysis: Research Summary and Key Takeaways

Introduction

- ✓ The muscular system applies complex forces to the scapula, in different directions and magnitudes, making stress patterns difficult to predict
- ✓ MTI testing with a specialized test apparatus can simulate muscular loading on the scapula
- ✓ Direct Image Correlation technology can accurately determine the stress on the scapula's surface using image captures

Research Objectives

- ✓ To apply physiologically accurate loads to a scapula model
- ✓ To optically determine the distribution of stress and displacement across the acromion
- ✓ To use results to improve surgical procedures for better patient outcomes



DIC User Interface

Showing Strain on Scapula at 283N Applied Load

Result & Discussion

MTI Testing Lessons

Test Repetition

When unanticipated results are given, keeping as many variables as possible constant and repeating tests until a pattern emerges can help gather data on possible issues.

CAD Design Validation

When the testing apparatus was being adjusted several issues with proposed designs were identified using the apparatus' CAD model.

DIC Testing Lessons

Data Repetition

To ensure that data is as accurate as possible, repetitions of the same experiment can be used to ensure that data readings are consistent.

Device Calibration

Precision equipment like the DIC requires utmost care when adjusting and calibrating, to ensure that readings are accurate.

Overall Takeaways

- Documentation for all setup and test procedures, software parameters, and revisions is absolutely essential for successful data collection.
- When using experimental devices such as the MTI and DIC, it is essential to have multiple precautions in place to ensure user safety and to prevent equipment damage.



DIC Camera Apparatus

Aramis Adjustable 24M Digital Image Correlation Apparatus

Future Work

- ✓ This research is ongoing, and testing is still in progress
- ✓ Test design has recently been updated, so prior tests and results must be rerun and reanalyzed



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