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POCUS Feasibility Study in Traumatic Hip Fracture Population.

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BACKGROUND

Prompt hip fracture repair is critical as delays beyond 24 hours are associated with increased morbidity and mortality[1]. Cardiovascular comorbidities increase these risks in adults. Preoperative transthoracic echocardiography (TTE) aids risk assessment but often delays surgery. Echocardiographic Assessment Using Subxiphoid-only (EASy) protocol, a Focused cardiac ultrasound (FOCUS), offers a rapid bedside alternative for cardiac phenotyping without delaying intervention[2].

OBJECTIVE

We aim to evaluate the feasibility and concordance of EASy protocol phenotyping with comprehensive cardiology-interpreted echocardiography.

METHODS

Retrospective feasibility study of 56 adults undergoing hip fracture repair at a single academic medical center, selected from a cohort of 415 patients (2015–2020). Standard echocardiography reports were compared with 7 possible cardiac phenotypes derived using the EASy protocol. Agreement was assessed for atrial/ventricular size and IVC dynamics, with additional clinically significant findings missed by phenotyping, including moderate-severe valvular disease, reduced EF, regional wall motion abnormalities, and coronary ischemia.

RESULTS/DISCUSSION

Among the 56 patients included, subcostal (SC) phenotyping by EASy matched with full cardiology echocardiography in 24 of 40 evaluable cases (60%) and did not match in 16 (40%). IVC phenotyping matched in 22 of 38 cases (58%) and did not match in 16 (42%). In addition to these phenotype comparisons, formal echocardiography found important findings that were not caught by phenotyping. These findings were often valvular disease (n=24) then regional wall motion abnormalities (n=7) and reduced EF (n=6). Preoperative interventional steps taken because of findings occurred in only 4 patients (54 had no intervention). These steps included catheterization (n=3) and TAVR (n=1).

These results show that even though EASy phenotyping has some concordance with full echocardiography for SC and IVC assessment, many cases were not in full agreement and important structural and functional problems were missed. Valvular disease was the common problem that was missed as the EASy protocol framework was made to describe hemodynamic states, not identification of specific valvular issues.

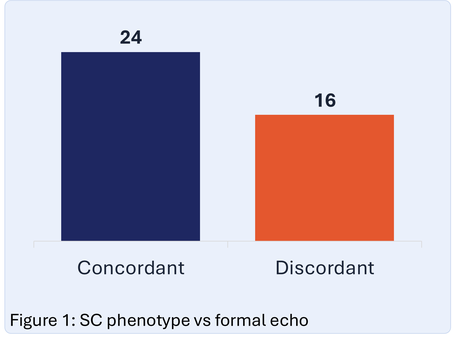


Figure 1: SC phenotype vs formal echo

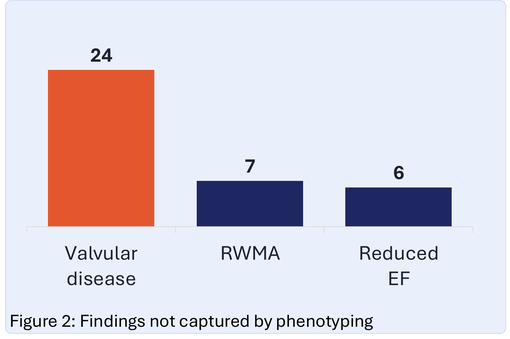


Figure 2: Findings not captured by phenotyping

CONCLUSION/FURTHER DIRECTIONS

Preliminary findings suggest EASy may be insufficient as an independent screening tool in hip fracture assessment. Majority of patients had findings missed by EASy, including moderate-to-severe valvular disease, reduced EF, regional wall motion abnormalities, and signs of coronary ischemia. Modified phenotyping systems capable of identifying severe findings may be needed. EASy may function better as a rapid triage tool than a TTE replacement, with a tiered approach potentially improving identification of discordant findings.
Future analyses will compare time-to-surgery between the POCUS subset and overall hip fracture cohort, as well as concordance between EASy subcostal phenotypes, IVC phenotypes and full cardiology echo findings. The frequency of clinically significant findings missed by EASy will also be quantified.

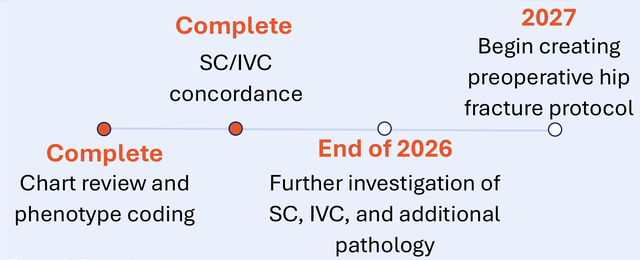


Figure 3: Project roadmap