



Article Appraisal

Article: FAST ultrasound examination as a predictor of outcomes after resuscitative thoracotomy: a prospective evaluation” Inaba et al. 2015. Annals of surgery, no. 3.

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Background and Study Objective(s):

Resuscitative thoracotomy in the emergency department is a very low yield and resource intensive intervention done as a last-ditch effort in an attempt to save the life of a patient in traumatic cardiac arrest. This study sought to examine if a FAST ultrasound done in the emergency department could help predict patients that would benefit from this high-risk procedure.

Study Design:

This was a single center, prospective observational study. Over 3.5 years, 187 of the 223 consecutive patients that presented in traumatic cardiac arrest received a FAST exam by an EM resident prior to resuscitative thoracotomy. The images of adequate quality were assessed for findings of pericardial fluid and/or organized contractions of the heart. The primary outcome examined was the correlation of positive findings on cardiac FAST with survival to hospital discharge or organ donation.

Results:

Of the 223 patients receiving ED thoracotomy and the 187 included in the analysis, 100% of both survivors and organ donors had a positive finding of pericardial fluid or cardiac motion on the pre-procedure FAST exam. There were a total of 6 survivors and 3 organ donors, in keeping with survival rates reported in previous literature. Cardiac motion on ultrasound was reported as having a 100% negative predictive value and a 16.7% positive predictive value for survival of ED thoracotomy following traumatic arrest.

Validity of Results:

This study had acceptable internal validity – they were able to enroll the vast majority of eligible patients presenting to their emergency department, and had very clear primary end points (death, discharge or organ donation), that ensured 100% follow-up of results.

Generalizability of Results:

It was generally felt by journal club members that the findings and conclusions of this study would be applicable to their own practice setting. While a multi-center randomized control trial would obviously have been preferable to this single center observational study, it was accepted that there are major limitations to doing this and that this is likely the best evidence we are likely to get on this topic for a long time. Participants felt that if one of the biggest and most aggressive trauma centers in the world were not able to rescue any patients in 4 years with a negative FAST exam, that attempting to do so in one's own, less equipped and experienced hospital would be futile in most circumstances as well.

The Bottom Line:

This study was not designed to be able to determine cause and effect relationships, nor should its results make one feel they should do a resuscitative thoracotomy on any patient they would not have previously. However, it does provide sufficient evidence regarding prognosis to suggest that providers should likely NOT do a thoracotomy on a patient with a bedside ultrasound that clearly demonstrates a lack of cardiac motion or pericardial effusion.