

NON-EXPERT VIDEO RATING OF CRITICAL VIEW OF SAFETY DURING CHOLECYSTECTOMY

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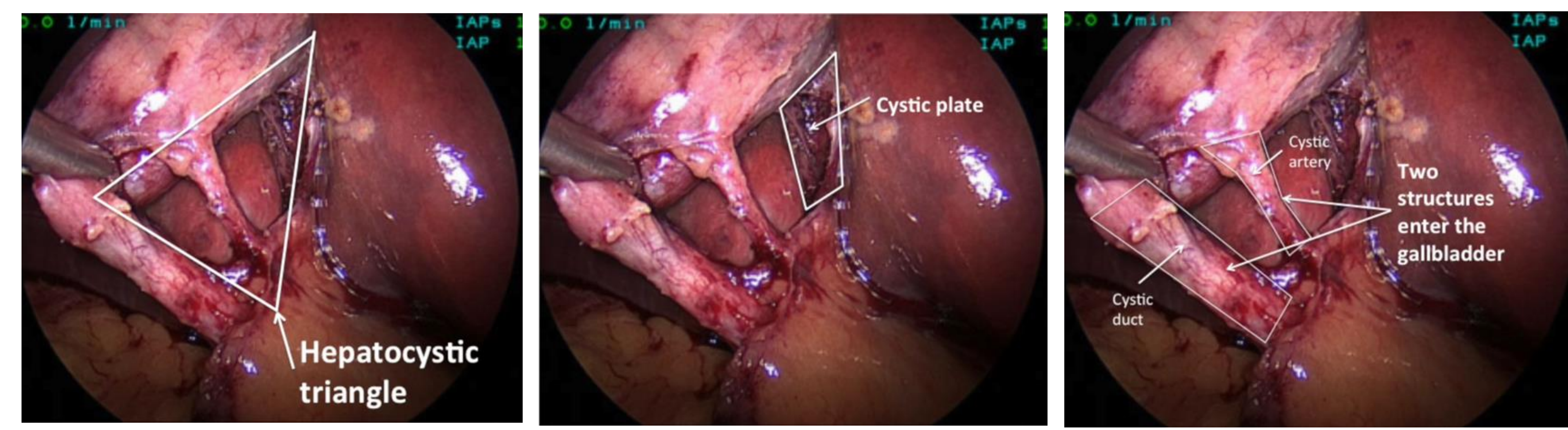
Background

- The objective of this study was to compare the assessments by non-clinical reviewers (non-experts) versus faculty hepatobiliary surgeons (experts) of the Critical View of Safety during minimally invasive cholecystectomies.
- Critical View of Safety (CVS) is a proven method to prevent biliary injuries; however, data shows that it is not well-understood. A cost- and time-effective method for assessment of the adequacy of the CVS would be useful for surgeon education.

Methods

- Minimally invasive cholecystectomy videos were collected from January 2014 to February 2019.
- Multimodal training was completed by all participants which included a written information packet (developed by Deal et al), exemplar videos, and/or in-person education.
- An online platform was developed to review and score the CVS. The CVS was scored using previously published methodology by Deal et al. The videos were edited and accelerated for analysis.
- Inter-coder reliability was evaluated using Krippendorff's alpha and Spearman's correlation was used to compare non-expert scores to experts. All statistics were performed using SPSS (v25).

Critical View of Safety Criteria



- 1- The hepatocystic triangle must be cleared of fat and fibrous tissue
- 2- The lower one-third of gallbladder must be separated from the liver to expose the cystic plate.
- 3- Two and only two structures should be seen entering the gallbladder.

Critical View of Safety 6-Point Grading Scale

Criteria	0 Points	1 Point	2 Points
Hepatocystic triangle clearance	Tissue in triangle obscures view of structures	Some obscurement of triangle	Hepatocystic triangle cleared of all tissue except : 1) cystic duct ,and 2) cystic artery
Cystic Plate Clearance	Not visible	Visible but overlapped by anatomical structures	Bottom 1/3rd of gallbladder is clearly demonstrated & cystic plate is shown
Cystic artery & cystic duct connected to gallbladder	Unable to identify both structures OR only one structure is seen.	Both structures are visible, but an overlap is observed.	Both structures are clearly seen connected to gallbladder.

Results

- A total of 63 minimally invasive cholecystectomy videos were collected for analysis. 8 non-experts and 2 experts were recruited to review the videos.
- The median length of the final videos for review was 22 (IQR 17-27) seconds.
- The median time per reviewer of 51.0 (IQR 42-69) seconds was taken to grade the videos.
- The inter-coder reliability between experts was 0.74 with an average CVS score of 4.8 (SD=1.15).
- The CVS score between non-experts and experts showed a strong correlation of 0.82 ($p\text{-value} \leq 0.01$).

Conclusion

Our findings suggest that the rating of CVS by non-clinical reviewers is consistent with ratings by faculty hepatobiliary surgeons. Future research will be done on the feasibility of implementing this approach on a larger scale.

References:

1. Strasberg SM, Brunt LM. Rationale and use of the critical view of safety in laparoscopic cholecystectomy. Journal of the American College of Surgeons. 2010
2. Strasberg SM. A perspective on the critical view of safety in laparoscopic cholecystectomy. Annals of Laparoscopic and Endoscopic Surgery. 2017