AB019. SOH21AS196. Inter-user variation in the interpretation of near infra-red perfusion imaging using indocyanine green in colorectal surgery

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Background: Despite increasing endorsement of near-infrared perfusion assessment using indocyanine green (ICG) during colorectal surgery, little work has yet been done regarding learning curve and inter-observer variation most especially on surgical video reflective of real-world usage.
Methods: Surgeons with established expertise in ICG usage were invited to participate in the study along with others without such experience including trainees. All participants completed an opinion questionnaire and interpreted video presentations of fluorescence angiograms in a variety of colorectal case scenarios. An interactive video platform (Mindstamp) enabled dynamic annotation. Statistical analysis of data was
performed using Kruskal Wallis and Mann Whitney testing as well as Intra-class Correlation Coefficients and Fleiss Multi-rater Kappa Scoring.
Results: Forty participants (six experts) provided data and judgement of 14 videos (nine showing proximal colonic transection site perfusion, four showing completed anastomoses and one an acutely strangulated bowel). Seventy percent felt >10 cases were needed for competency in use with the majority of experts advocating >50 (P<0.05). Overall agreement among experts was "good" for videos showing colonic transection perfusion (versus "moderate" among in-experts) with experts clustering more distally. In contrast, there was no interpretation concordance among experts or in-experts when judging ICG perfusion sufficiency on a yes/no basis.
Conclusions: Significant experience is recommended before reliance on ICG perfusion angiograms. ICG fluorescence assessment is prone to variable interpretation and influenced by experience and, perhaps, knowledge of pre-assessment operative steps suggesting a role for objective flow analysis with artificial intelligence methods as the next phase of this technology.
Keywords: Colorectal surgery; indocyanine green (ICG); interobserver variability; learning curve; near-infrared perfusion assessment; perfusion angiogram

doi: 10.21037/map-21-ab019
Cite this abstract as: Hardy N, Dalli J, Khan MF, Andrejevic P, Neary P, Cahill R. Inter-user variation in the interpretation of near infra-red perfusion imaging using indocyanine green in colorectal surgery. Mesentery Peritoneum 2021;5:AB019.