MP01-06 - Development of a technical checklist for the assessment of suturing in robotic simulation

Ahmad Gunji1, Nicholas Raison2, Ben Challacombe3, Shamim Khan2, Prokar Dasgupta1, Kamran Ahmed2
1KGT School of Medical Education, King’s College London, London, UK, 2Division of Transplantation Immunology & Mucosal Biology, Guy’s Hospital, MRC Centre for Transplantation, King’s College London, London, UK, 3Department of Urology, Guy’s and St Thomas’, NHS Trust, London, UK

Introduction

• Simulation is a key training tool that facilitates training outside of the operating room (OR).
• It is recommended that robotic surgeons practice outside the OR, particularly in the initial error-prone phase of the learning curve.
• Training tools require objective forms of assessment to evaluate trainees.
• Checklists form an important component of surgical skills assessment.
• The Global Evaluative Assessment of Robotic Skills (GEARS) is the gold standard for assessing skills in robotic surgery, but there are no recognised checklist scoring systems.

Objective

• The purpose of this study was to develop and validate a checklist for evaluating suturing in robotic surgery.

Methods

• Participants performing a urethrosurgical anastomosis were evaluated to construct a checklist with needle driving and suturing components.
• Key suturing procedural steps were identified from a review of expert videos.
• Observing novice videos allowed identification of further technical steps and common errors.
• 22 novices and 13 experts were marked on needle driving.
• 18 novices and 10 experts were assessed on knot tying.
• Validation was undertaken by comparison with the GEARS score.

Reliability

• The internal consistency of the preliminary checklist was high [Cronbach’s alpha = 0.870 for needle driving items, and 0.736 for knot tying items].
• After removal of poorly correlating items, the final checklist contained 32 items (Table 1).

Construct Validity

Results

Concurrent Validity

• The needle driving category significantly correlated with the corresponding GEARS scores (r = 0.613, p < 0.005).
• The correlation for knot tying was insignificant (r = 0.296, p = 0.127).

Conclusions

• This study reports the development of a new assessment tool for evaluating suturing skills in robotic surgery, and demonstrates reliability and validity.
• The correlation for knot tying was insignificant, but the GEARS score was not able to discriminate significantly between experts and novices.
• Checklists are an unambiguous measure of performance and are easy to use, while global rating scales require more judgement.
• Although the study primarily assessed a UVA, the items in the checklist are designed to be general enough to be applied to any suturing procedure in robotics as they all follow the same fundamental steps.
• There is scope to use the checklist in both assessing trainees, as well as in surgical education research.

Table 1: Final checklist used for validity analysis