

Utility of a Validated Rating Scale for Self-Assessment in Microsurgical Training

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OBJECTIVE: The purpose of this study is to determine the utility of self-assessment in microsurgical training using a previously validated rating scale.

DESIGN: A prospective study of surgical residents taking a hands-on 5-day microsurgical training course. Learners completed multiple self-assessments of their technical skills using the University of Western Ontario Microsurgical Acquisition/Assessment instrument. Simultaneously, preceptors assessed the learners using the same scale. Self-assessment and preceptor scores were compared using the Pearson correlation coefficient (PCC).

RESULTS: There was a significant agreement noted between the 32 preceptor assessments and 36 self-assessments that were completed. Correlation between scores for the knot-tying (PCC = 0.62) and anastomosis modules (PCC = 0.77) was good and excellent, respectively. Preceptor scores and self-scores improved over the duration of the course: for preceptors, knot-tying scores increased from 58% on day 1 to 78% on day 5 ($p = 0.02$) and anastomosis scores improved from 56% to 82% ($p = 0.004$); for self-scores, knot-tying scores increased from 44% to 81% ($p = 0.001$) and anastomosis scores from 49% to 84% ($p = 0.001$). Learners with greater experience (higher postgraduate year level) tended to have higher self as well as preceptor ratings, albeit not statistically significant.

CONCLUSION: Self-assessment using the University of Western Ontario Microsurgical Acquisition/Assessment instrument has good to excellent agreement with preceptor-assessment scores suggesting good interrater reliability. Self-assessment using such tools may, therefore, be used along with preceptor supervision and assessment to potentially improve self-directed learning during these courses. (J Surg Ed ■■■■■. ©2016 Association of Program

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KEY WORDS: self-assessment, microsurgery, global rating scale, University of Western Ontario Microsurgical Acquisition/Assessment instrument

COMPETENCIES: Practice-Based Learning, Medical Knowledge, Patient Care

INTRODUCTION

Microsurgical skills are a key requirement for a number of surgical residency programs, including plastic surgery; ear, nose, and throat; gynecology; ophthalmology; orthopedic surgery; urology; and vascular surgery. These skills are difficult to teach as they require fine motor control, focus, and careful handling of blood vessels as small as 1 mm in diameter. Minor mistakes may lead to surgical failure with significant morbidity. These high stakes have driven microsurgical educators to use models and simulation before transferring these skills to actual patients.¹ Microsurgical training courses are often instituted for junior residents who learn key technical skills on rat femoral vessels in a controlled laboratory setting.² These courses are expensive³ and labor-intensive for surgeons who give up large amounts of time to teach and evaluate individual resident progress.⁴

Formal skills assessment is an essential aspect of the education of novice microsurgeons. Such assessments identify areas of weakness and determine when residents are ready to “graduate” and use their skills in the real patient setting.⁵ A recent systematic review of microsurgical assessment tools identified 3 global rating scales and 1 motion analysis assessment device that were determined to be valid in assessing microsurgical skill.⁶ Although motion assessment devices are useful in the objective assessment of skill,⁷ they may also be prohibitively expensive for some centers, and therefore global rating scales have been more widely adopted.⁶ Of the validated assessment scales identified by Dumestre et al.,⁶ the University of Western Ontario Microsurgical Acquisition/Assessment instrument

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(UWOMSA) had the most robust demonstration of validity and reliability. This assessment tool was developed specifically for microsurgical training and provides preceptors with a standardized method to assess the key skills required to perform successful microsurgery.

Given the challenge of staffing surgical skills laboratories full-time with microsurgical educators, it would be useful if self-assessment with the UWOMSA instrument was valid such that it could be used in conjunction with preceptor assessments. This study examines the correlation between self-assessment and preceptor-assessment using the UWOMSA to rate technical proficiency.

MATERIALS AND METHODS

Ethics approval was obtained from the University of Calgary Conjoint Health Research Ethics Board (REB14-0900). Informed consent was obtained from all study participants.

A total of 8 surgical residents, ranging from postgraduate year (PGY) 1 to PGY 3 participated in the study. The course was run over 5 days for 8 h/d, with learners working in a laboratory setting on anesthetized rats. Equipment such as surgical microscopes, instruments, and sutures of similar quality to those found in the operating room was provided. On the first day an introductory session was given by a microsurgeon and the learners were given course materials including reference texts, demonstrative videos, and a technical manual. Learners received one-on-one direction and guidance from 1 of 5 preceptors. Most preceptors volunteered for one day of the course resulting in a different assessor for each resident on consecutive days of training.

The UWOMSA instrument comprises 2 modules, 1 for knot-tying, and 1 for anastomosis. The knot-tying module has 3 subscales including “quality of knot,” “efficiency,” and “handling.” The anastomosis module has 3 subscales including “preparation,” “suturing,” and “final product.” Each subscale consists of a 5-point Likert scale with anchor definitions for scores of 1, 3, and 5. These definitions help to increase the objectivity of the scores. For example, in the “quality of knot”

subscale, a score of 1 has an anchor definition of “not square, loose, cut ends too long/short,” a score of 3 corresponds to “partially square, somewhat loose, cut ends OK length,” and a score of 5, “square knot, snug, cut ends proper length.” In the anastomosis module, for the “preparation” subscale, a score of 1 corresponds to “forgets background, vessel ends set up poorly in approximating clamp, forgets dilatation,” a score of 3 corresponds to “rough dilatation, excessive/inadequate adventitial stripping,” and a score of 5, “background in place, approximating clamp applied correctly, gentle dilatation, clean adventitial stripping.”⁵

On completion of an anastomosis on the femoral artery, vein, or both, the preceptor and the learner independently completed the UWOMSA form. Learners were blinded to the preceptors’ UWOMSA scores, and vice versa. Both preceptor and learner forms were collected and retained as part of the residents’ educational files. Learners did receive verbal feedback from the preceptor once the self-assessments were handed in.

For this study, data were collected in real time and consisted primarily of preceptor and self-assessment scores. Scores were gathered directly from the Likert scales within the UWOMSA assessment forms and recorded as percentages for both knot-tying and vessel anastomosis modules. Other data collected included PGY of training and day (1-5) of training of the course. To determine agreement, preceptors’ and learners’ scores were correlated using the Pearson correlation coefficient (PCC). A coefficient of 0 to 0.25 was considered to have “no” agreement, >0.25 to 0.50 “fair” agreement, >0.50 to 0.75 “good” agreement, and >0.75 “excellent” agreement.⁸ Paired *t*-tests were used for comparisons of scores over course duration and unpaired *t*-tests for comparison of scores by PGY level. A *p* < 0.05 was considered significant. All data were analyzed using SPSS (Version 16.0, SPSS Inc., Chicago, IL).

RESULTS

A total of 8 surgical residents participated in the study, comprising 3 residents from PGY 1, 2 from PGY 2, and 3 from PGY 3. Of the 40 anticipated assessments, 32

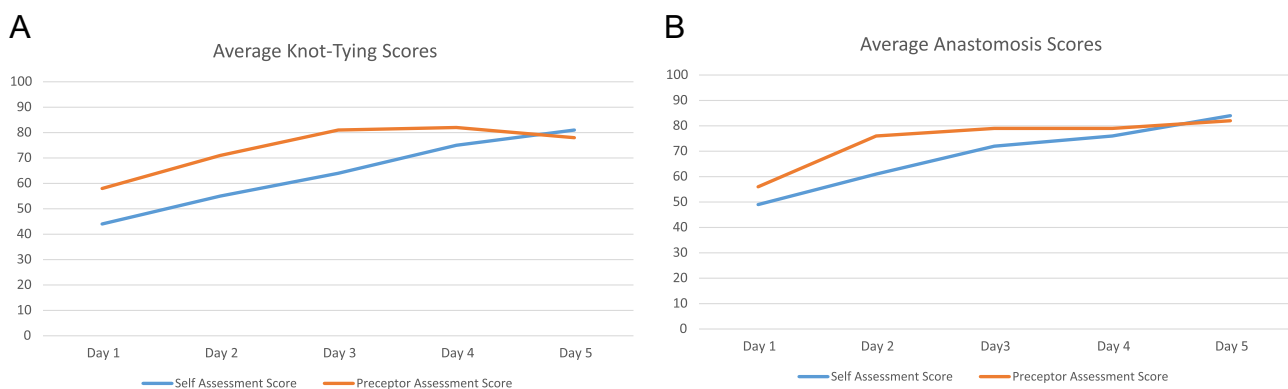


FIGURE 1. (A) Averages of self- and preceptor-assessment scores for knot-tying module by day of training. (B) Averages of self- and preceptor-assessment scores for anastomosis module by day of training.

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