Low-Hanging Fruit: Using Clementines for laparoscopic surgery training in gynecological oncology

Background
Low-cost, high-fidelity models for laparoscopic surgery training in gynecological oncology are not currently available. The objective was to design a model for developing associated fine, precise laparoscopic dissection skills with accompanying surgical decision making.

Methods
Ethics Review Committee approval was secured for this study. We asked residents/fellows to remove the peel of a Clementine in as few pieces as possible, separate and remove all pith from and between all fruit segments, and return the Clementine to as close to its natural state as possible with completely closed skin (sutured). Clinical decision-making included deciding when to complete the procedure “open” or when unacceptable segment damage would result by removing difficult to extract pith. The analogy corresponds to deciding when to leave cancerous lesions or metastases in place to be treated through other methods (radiation, chemo, etc.), rather than risking damage to the vital organs or other healthy tissues. Faculty, blinded to the training status of the subjects, assessed their video-recorded performance using a rating scale, in addition to noted objective performance measures.

Results
Faculty ratings indicated significant differences between the performance of junior/senior residents and fellows (p<0.05) on operative planning/plan use, gross/fine dissection skills, instrument selection/control, tissue handling/damage, operative reasoning, clinical Judgment, and overall performance. Subjects reported specific advantages for using the exercise to develop surgical skills, reasoning and decision making. Examples of two subjects of varying skill are included in Figure 1.

Conclusions
A low-cost, easily facilitated simulation-based model for developing advanced laparoscopic surgical skills may advance the preparation of residents and fellows for gynecological oncology practice, providing a platform for development/maintenance of skills, critical thinking and clinical judgment. This model could also provide an option for laparoscopic skill development in low and limited resource environments globally.