

Incorporation of Fresh Tissue Surgical Simulation Into Plastic Surgery Education: 5 Year Evolution of An Essential Educational Experience

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Abstract Text:

Background: As interest in surgical simulation gains momentum, plastic surgical educators are pressed to provide realistic surgical experience outside of the operating suite. High fidelity models of plastic surgery procedures are still incomparable to dissection of fresh tissue. We have evolved a fresh tissue dissection and simulation program with emphasis on surgical technique and simulation of clinical surgery. We hypothesized that resident education, confidence, and ultimately quality of surgical performance could be improved by adding fresh tissue dissection and simulation to our resident educational curriculum.

Methods: Over a 5 year period Fresh Tissue Dissection (FTD) using fresh cadavers was incorporated into resident curricula. Participants performed biweekly dissections and simulations of procedures performed on each rotation with structured emphasis on anatomical detail, surgical technique and maneuvers, and rehearsal of operative sequence, according to skill level and clinical need. Surgical simulation was performed with standard fresh tissue dissection. Vascular perfusion was also added to simulation to maximize realistic operative simulation. Resident performance was evaluated using retrospective pre and post tests in addition to a web based survey that evaluated resident perception of technique. All answers were ranked according to a 5 point scale: 1-not confident to 5- very confident.

Results: The curriculum evolved, became increasingly relevant, and ultimately was incorporated directly into most resident rotations. A total of 79 dissection days occurred, and a total of 199 procedures were reported, including 81 anatomical dissections, 54 direct surgical simulations, and 26 preoperative surgical rehearsals. Data regarding confidence pre and post participation were gathered for 189 procedures and for 26 surgical rehearsals. Overall, Resident predissection confidence was 1.93 ± 1.04 and post dissection was 4.21 ± 0.93 ($p < .01$). Survey data demonstrated that participants believed that FTD improved their operative abilities. All residents felt that their technique ($4.6 \pm .75$), speed ($4.3 \pm .56$), safety (4.57 ± 0.5) and knowledge of anatomy (4.7 ± 0.5) improved.

Conclusions: Given adequate access to fresh tissue, a plastic surgery experience with FTD can improve resident confidence and perception of performance. High fidelity models were created that simulated live surgery. We believe FTD provides adequate extraclinical experience to improve the abilities of our residents. While initial data suggests that operative performance is subjectively improved, additional evaluation is needed to establish objective evidence that patient outcomes and surgical quality can be improved.