



Implementation of a Pilot Ophthalmic-focussed Undergraduate Microsurgical Skills Training Programme

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PURPOSE

Given a current lack of UK undergraduate microsurgical training, and only a paucity of Ophthalmic surgery-focussed practical educational courses for students, we introduced a novel national course engaging and assessing medical students interested in microsurgical specialties such as Ophthalmology.

METHODS

Collaborating with an international eye care pharmaceutical company, and Registrar to Consultant level Ophthalmologists, we designed a one-day bespoke training programme incorporating lectures followed by breakout practical sessions.

Lectures covered microsurgical techniques as well as ophthalmic-focussed content, including anatomy, phacoemulsification principles and procedure, and strabismus surgery.

16 medical students gained supervised and assessed hands-on experience utilising state-of-the-art phacoemulsification systems in conjunction with surgical instruments to remove in situ cataracts from tactile synthetic simulation eyes via established surgical proforma.

This was followed by intraocular lens implantation into the aphakic eyes, in addition to microsurgical suturing simulating extraocular muscle and corneal graft surgery.

We also provided high-fidelity ophthalmic surgical simulators with assessed forceps training and capsulorrhexis modules, in addition to virtual reality headsets for anatomy demonstration.

We administered pre- and post-course questionnaires with 5-point Likert scales and qualitative questions to all delegates with a 100% response rate.

RESULTS

We administered pre-/post-course questionnaires to all delegates. 5-point Likert responses demonstrated statistically significant increases across assessed metrics including confidence describing phacoemulsification steps from 1.75 ± 1.13 to 4.44 ± 0.63 ($p < 0.0001$), confidence performing basic microsurgical techniques from 2.31 ± 1.14 to 3.88 ± 0.62 ($p < 0.0001$), and to considering a career in surgery from 3.94 ± 0.93 to 4.63 ± 0.62 ($p = 0.0195$).

Qualitative feedback for the microsurgical training course included 'an incredible, transformative experience'. Overall Likert responses for lectures ranged from 4.50 ± 0.82 to 4.81 ± 0.40 , and for practical sessions from 4.25 ± 0.86 to 5.00 ± 0.00 .



Figure 1

1A-H Illustration of programme implementation. 1A Wetlab with 8 Infiniti or Centurion phacoemulsification systems with teaching microscopes and necessary surgical grade instruments. 1B Delegate performing steps of phacoemulsification on synthetic eye. 1C Breakout workshop for microsuturing with demonstrator simulating extraocular muscle and corneal graft procedures. 1D Supervisor aiding delegate during phacoemulsification protocol. 1E Delegates with demonstrator working through Eyesi surgical simulator modules. 1F Delegate implanting intraocular lens into aphakic synthetic eye using medical grade injector. 1G Delegate experiencing virtual reality platform for ocular anatomy demonstration. 1H Programme delegates with supervisor outside of hosting venue.

CONCLUSIONS

Organisation and implementation of a practical microsurgical skills training programme targeted towards undergraduate medical students was feasible, and cost-effective, despite the inclusion of state-of-the-art surgical teaching equipment.

Given encouraging assessment metrics data we propose to collaboratively expand and implement this novel educational initiative, increasing undergraduate engagement with microsurgery and Ophthalmology.