A steady hand or a sharp eye? What do surgical trainees learn in the operating theatre?

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BACKGROUND

Implementation of the European Working Time Directive (EWTD) has significantly reduced the hours that surgical trainees spend in the operating theatre. Prior to developing other learning practices to replace this lost training, it is necessary to systematically investigate what is learnt by surgical trainees in the operating theatre environment.

AIMS

This study aims to make explicit what is learnt by the surgical trainee during a laparoscopic cholecystectomy.

METHOD

This was an in-depth observational study conducted over two years at a major London teaching hospital by paired researchers from differing academic backgrounds – surgery and the social sciences.

Freehand observations were made at 50 heterogeneous operations. 14 Laparoscopic cholecystectomies were recorded for further in-depth analysis.

Trainers and trainees involved in these operations were audio-recorded. The laparoscopic view was video-recorded.

The audio recording was transcribed verbatim and iterative thematic analysis using a grounded theory methodology conducted within Transana (a qualitative analysis software program for audio and video data). 326 short episode clips were generated from these 14 operations. Verbal and non-verbal interactions during the operation were then systematically analysed to elucidate what is taught and learnt during the surgery.

RESULTS

Major themes of learning that emerged from the analysis of the video and audio data were:

- Learning factual knowledge
- Learning motor skills
- Learning to interpret visual cues
- Learning to optimize visual cues
- Learning contingency strategies
- Learning team-working and management skills
- Learning surgical attitude

130 / 326 clips were categorized as learning how to interpret visual cues – understanding what structures look like in vivo in health and disease and how to identify an anatomical plane for dissection.

63 / 326 clips were categorized as learning how to optimize visual cues (what to do when things go wrong).

50 / 326 clips were categorized as learning contingency strategies.

DISCUSSION

Learning to interpret visual cues was found to be a crucial domain of learning during laparoscopic cholecystectomy. This is not a domain of learning that is well reported in the surgical literature although other medical specialties, for example pathologists diagnosing a rash or radiologists reporting a scans1 – 5, have recognized that learning visual cue interpretation is key to developing specialty specific competencies.

In laparoscopic surgery visual cue interpretation may particularly important as the haptic cues are diminished due to transmission through long laparoscopic instruments and interference with the haptic cues due to friction within the port 6.

Intra-operative errors are predominantly due to mis-perception rather than poor motor skills or clumsy handwork7 and so promoting the learning of visual cue interpretation in the era of laparoscopic surgery is crucial for safe surgical practice.

Building a rich memory library of visual cues may be important for this domain of learning, this may be addressed by using selective video footage for training purposes.

CONCLUSIONS

- Learning to interpret visual cues is an important area of learning for the surgical trainee and is learnt in part through having seen many examples, this is problematic in the context of EWTD.
- Viewing of selected ‘tricky’ laparoscopic video clips away from the workplace may aid learning in this domain and should be considered alongside motor skills learning in simulation.

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