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Comparison of Surgeon Gaze Behavior Against Objective Skill Assessment in Open Inguinal Hernia Repair – A Pilot Study

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Introduction

Technical skill is associated with improved post-operative outcomes (1). Adoption of a formalised high-stakes assessment of surgical skill is technically challenging and limited by the financial and human resources available. Analysis of gaze behaviours has shown promise as an adjunct assessment tool of surgical skill (2).

Aim

This pilot study aimed to assess the ability to adopt gaze behaviour analysis as an adjunct assessment of surgical skill within live open inguinal herniorrhaphy.

Methods

Gaze was measured with Tobii Pro eye tracking Glasses 2 (Tobii AB, Sweden) – figure 1.

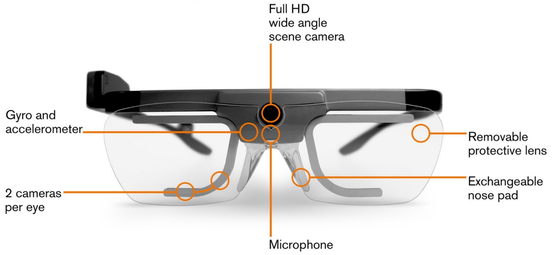


Figure 1: Tobii Pro eye tracking Glasses 2

All grades of surgeon were included. Primary outcomes were percentage of dwell time and fixation frequency (markers of cognitive attention and performance) on areas of interest correlated to mean Objective Skill Assessment of Technical Skill (OSATS) score. Significance was determined by $p<0.050$.

Demographics

Demographic	Median	Range
Surgeon	-	-
Number of hernia operations previously performed	160	100 - 500
% of procedure performed	100%	20% - 100%
Patient	-	-
ASA	2	1 - 2
Length of operation	45 minutes	40 – 90 minutes

Table 1: Patient and surgeon demographic characteristics

Results

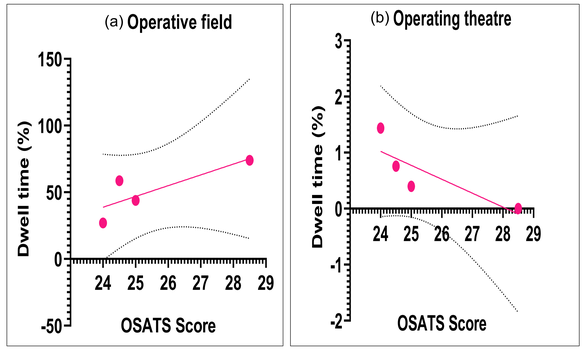


Figure 2: dwell time (%) of users, a marker of cognitive attention, on the operative field (a) and the operating theatre (b) compared to their OSATS score

Conclusion

This pilot study demonstrated the feasibility of recording gaze behaviours for comparison against formal skills assessment to determine the role of eye tracking in live high stakes technical skills assessment. Utilising this pilot data and literature review, a full study of 18 participants will now commence based on a formal power calculation.

References

1. Birkmeyer JD, Finks JF, O'Reilly A, Oerline M, Carlin AM, Nunn AR, et al. Surgical Skill and Complication Rates after Bariatric Surgery. N Engl J Med. 2013;369(15): 1434-1442.
2.Tien T, Pucher PH, Sodergren MH, Sriskandarajah K, Yang G, Darzi A. Eye tracking for skills assessment and training: a systematic review. Journal of surgical research. 2014;191(1): 169-178.

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