ACCLIMATISING TO THREE DIMENSIONS: TECHNOLOGICAL ADVANCES AIDING PROGRESSION TO ROBOTIC SURGERY

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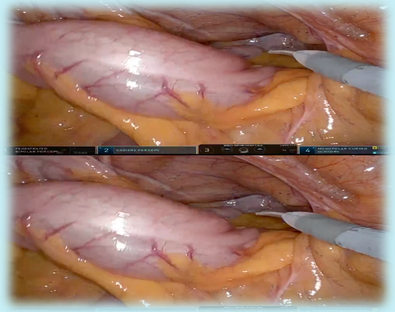
INTRODUCTION

The learning curve when transitioning to robotics is multifactorial. Aside from the array of new controls and features, one often overlooked aspect is the immersive view. The console offers a high definition three dimensional view which gives an appreciation of anatomy and surgical planes not previously encountered during conventional laparoscopy. However, there is presently no method of studying this prior to performing live cases. We aim to utilise cutting edge technology capable of three dimensional views in order to improve the acclimatisation process.

METHODS

Our institution has been able to extract the three dimensional video feed from live surgical cases. This has enabled its application in two forms of pioneering technology. The first has allowed the translation of the three dimensional video onto a virtual reality headset. Users will be transported into an immersive environment thus giving a view akin to the surgical console. The second, a new type of display monitor, provides panoramic views with optical depth, but without the need to wear additional equipment.

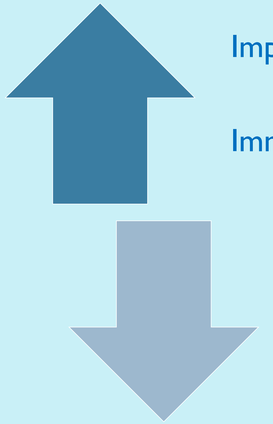






RESULTS

Despite being in primitive stages, our advances show potential. The usability and wearability will be assessed to determine the feasibility of the devices. Evaluation using NASA task load index questionnaires will focus on physical and mental load. Promising aspects include the accessibility the virtual reality headsets offer, as well as environmental factors. Notably, a decreased carbon footprint relative to the surgical console is important in the current socioeconomic climate. However, user reported symptoms of nausea, headache and dizziness with prolonged use of virtual reality headsets may limit generalisability. The surrogate three dimensional monitor may help to combat some of these limitations. An accessory-free user experience may enable an extended period of case observation with a decreased physical load.



Improved engagement

Immersive view

Decreased physical and mental loads

Smaller carbon footprint

CONCLUSIONS

The three dimensional view is an often underappreciated facet of the progression to robotics. Innovative technology allowing users to adapt to these views may be able improve the acclimatisation process. Further data is required for evaluation, however these advances may form part of a blended learning experience in the years to come.