INTRODUCTION

Wearing a second pair of surgical gloves in the operating room has been shown to effectively reduce the risk of transmission of infectious diseases between surgeon and patient. Despite the substantial evidence supporting double gloving, however, concern remains that a second pair of gloves may make surgeons requiring higher levels of delicate manipulation more difficult. Multiple studies have addressed this issue, but offered widely varying results and primarily surveyed sensation or gross motor skills applicable to normal surgery.

One area which has yet to be studied is the relationship between double gloving and performance of a specific form of surgery. Delicate tasks are performed under microscopy. The success of these procedures depends upon fine movement of the hands and great control of the amounts of pressure applied to sensitive structures. One such procedure is a stapedotomy, in which a stapes prosthesis is inserted into a small hole in the oval window of the cochlea. This also provides an opportunity for evaluation of this procedure may lead to poor results and even deafness. Our study attempts to test the effects of double gloving on performance of a simulated stapedotomy.

MATERIALS AND METHODS

This study was conceived as a randomized, controlled, crossover trial. It revolved primarily around performing a similar simulation of a stapedotomy on a model of the ossicular chain. This plastic ossicular model and a supply of Stapes Prostheses were provided by Grace Medical (Memphis, Tennessee) (Figure 1). Gloves were provided by Ansell Healthcare LLC (Iselin, New Jersey) which were in use in the operating room at Virginia Commonwealth University Hospital.

Our 41 participants were recruited from our medical and dental schools and randomized into two groups. All groups began by performing the task without gloves. Group A then performed the task with one pair of gloves while Group B first performed the task with two pairs of gloves. The total time taken to complete the task was recorded for each participant and the results subjected to a series of statistical measures.

RESULTS

Our study found a statistically significant difference in the average time taken to complete the task between trials with and without gloves (p=0.0050) but no difference between subjects who wore one single glove and double gloving (p=0.4919). Likewise, no significant difference was found between the two experimental groups (starting with single versus double gloving) (p=0.8692) (Figure 3). Our study is the first to examine the effects of double gloving on a task incorporating microsurgical skill using a simulated surgical procedure, in this case a stapedotomy. Our results were particularly consistent when single- and double-gloving were directly compared (p=0.4919). This suggests that wearing an additional pair of gloves does not negatively impact the ability to perform microsurgery. Additionally, other factors relating prior exposure to surgery, year of training and amount of video game playing had no bearing on how quickly students performed or learned this task.

CONCLUSIONS

The efficacy of double gloving as a safety measure has been well established by previous authors. Our study suggests that wearing two pairs of surgical gloves does not negatively affect the ability to perform a microsurgical procedure, lending support to the practice of double gloving, even in the setting of fine motor tasks.

ACKNOWLEDGEMENTS

The authors would like thank Grace Medical (Memphis, Tennessee) for their generous donation of a middle ear model of a stapedotomy as well as stapes piston prostheses. The authors would also like to thank Anne Le B.S., Audrey Le B.S., Wen Wan M.D. Ph.D., Daniel H. Coelho M.D. for their generous donations of material to the study and both the "single glove" and "double-glove" arms.REFERENCES