



Surgical Rehearsal Platform Use Improvement Measures in Aneurysm Clipping: A Prospective, Randomized Trial

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Introduction

The field of neurosurgery is constantly undergoing improvements and advances, both in technique and technology. Cerebrovascular neurosurgery is no exception, with endovascular treatments changing the treatment paradigm nationally. Clipping of aneurysms is still necessary, and advances are similarly made to help improve patient outcomes. Surgical Rehearsal Platforms (SRP) are surgical simulators which offer the opportunity to rehearse a surgery prior to entering the operative suite. This study is designed to determine whether use of an SRP in aneurysm surgery is helpful in decreasing aneurysm dissection time and clip manipulation of the aneurysm.

Methods

This study is a blinded, prospective, randomized study comparing key effort and time variables in 40 prospective SRP cases to the same variables in control cases. Randomization occurred in groups of four to help balance the entry time into the study across treatment groups. Descriptive statistics were calculated for both the SRP and the control groups. A double-blinded reviewer then analyzed videos. Surgical videos were analyzed for both total microsurgical time and number of clip attempts, both with

Results

Video recordings were analyzed comparing the SRP cases with control cases. Significant reduction in total microsurgical time, number of clip applications, and temporary clip time was noted on preliminary data analysis.

Conclusions

Preoperative rehearsal with SRPs increase efficiency and safety in aneurysm microsurgery as demonstrated by decreased operative times, fewer clip applications, and shorter temporary occlusion times. Long term follow up is needed to demonstrate improvement in patient outcomes related to shorter operative times, shorter temporary clip occlusion, and less intraoperative error. Future studies aimed at improving patient outcome and safety during surgical clipping of aneurysms will be needed to keep pace with the quickly advancing endovascular field.

Learning Objectives

By the conclusion of this session, participants should be able to 1) Identify the changing treatment paradigms for intracranial aneurysm management, 2) Identify the importance of virtual simulation training in cerebrovascular operations, 3) Describe the virtual simulation program at hand, and 4) Discuss, in small groups, future considerations for advancement of these technologies.

References