Effect of Annual Temporal Bone Course on Achievement of Competency in Mastoidectomy

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ABSTRACT

Objective: The purpose of this study is to 1) determine the educational value of a temporal bone laboratory course by comparing the operating room performance scores of the residents, before and after the temporal bone course and to 2) identify the role of potential supplemental bone courses throughout the educational year.

Study Design: Cross-sectional validation study.

Methods: Fourteen residents from Johns Hopkins Otolaryngology-Head & Neck Surgery (OHNS) residency program were evaluated in the operating room (OR) during their Otology rotation using a previously published and validated mastoidectomy assessment tool. Depending on the timing of the rotation, residents were assigned to four 3-month groups, with group one comprised of residents starting otology rotation in July, the beginning of the academic year. Groups one and two comprised of residents that had their otology rotation before the temporal bone course, while groups three and four after the temporal bone course. We calculated and compared the OR global and checklist scores between the groups in relation to the temporal bone course, which took place during the third group’s otology rotation.

Results: The residents from groups three and four, when compared to groups one and two, had significantly higher global and checklist OR scores.

Conclusion: Our results suggest that teaching hospitals should have more educational opportunities for residents for a greater improvement and retention of surgical skills. This should be achieved with implementation of smaller supplemental courses throughout the educational year and the use of virtual reality simulation.

INTRODUCTION

With the work hour limitations and increased accountability demanded by the society, residents require additional learning opportunities to attain the skills needed to practice exceptional patient care. Therefore, the traditional training model needs to improve in order to comply with the continuous changes in resident working hours and the requirements of credentialing bodies.

According to Reznick et. al.,1 the most common method of training in skills laboratories is a single multi-hour course. Little work has been done to examine the effects of these courses on residents technical skills and how they should be amended to best fulfill the requirements of surgical education.

The Department of Otolaryngology Head and Neck Surgery (OHNS) at the Johns Hopkins University has several skills courses implemented in the residency curriculum that provide the means for training residents in settings outside the operating room (OR). The mastoidectomy temporal bone course at Johns Hopkins spans four weekends of the academic year in January-February and consists of 16 to 20 hours of lectures and laboratory practice.

Previous studies in mastoidectomy have validated assessment tools and defined milestones2, but to our knowledge the importance of the skills lab and its transferability to the operating room for mastoidectomy has yet to be assessed. Therefore, the purpose of this study was to determine the effect of proximity of the temporal bone lab to the otology rotation on the resident’s performance of mastoidectomy in the operating room.

METHODS AND MATERIALS

Data collected from 14 residents of the Johns Hopkins OHNS residency program was used in this study. The participant pool consisted of trainees from post graduate year (PGY) levels 1-3. Eight faculty evaluators from otolaryngology department scored residents’ performance of mastoidectomy surgery in OR.

Four groups of trainees were created based on the timing of their otology rotation. Residents in Group 1 had their otology rotation in July, August, September, with Group 2 in October, November, December, Group 3 in Jan, Feb, March and Group 4 in April, May, June.

This study was conducted over a period of four years, through collecting data from residents’ performance in the OR. Evaluators used a two-part assessment tool for mastoidectomy skills that was developed as part of the Johns Hopkins Assessment of Surgical Competency in ENT. The Task Based Checklist (TBC) portion of the assessment was created from key steps outlined in the course curriculum and dissection manual. The second portion of the tool, the global rating system (GRS), consists of ten items that evaluate preparation and processes. Residents’ performance on each item was scored on a 5-point Likert scale. A score of 3 and above was considered competent/pass. 3

Global and checklist scores of the residents from the four groups were compared, in relation to the timing of the temporal bone lab, which took place in January-February (Table 1).

RESULTS

Fourteen residents and eight faculty evaluators participated in this study over a four-year period. A total of 99 evaluations were completed, with a median of 8 evaluations per resident. There were 2 residents in Group 1, 4 in Group 2, 6 in Group 3, and 3 in Group 4.

The average scores of each group were calculated and graphed. The average global and checklist scores for group 3 (3.05) and group 4 (3.49) were higher than group 1 (2.88) and 2 (3.01) (Table 2, Figure 1).

Table 1. Composition of the four groups of residents according to the proximity of the temporal bone course to their otology rotation.

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<tr>
<th>Group</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
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</thead>
<tbody>
<tr>
<td>Group 1</td>
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<td>2.95</td>
<td>3.01</td>
<td>3.54</td>
<td>3.05</td>
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<td>3.11</td>
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Table 2. Task based checklist (TBC) and global rating scale (GRS) of the four groups before and after the temporal bone course.

DISCUSSION

Since the introduction of the Accreditation Council of Graduate Medical Education (ACGME) Outcome Project in 2001, assessment and attainment of residents’ surgical competency has gained paramount importance. With 30% to 50% of all major surgical complications being potentially avoidable, it is imperative that teaching programs have all the necessary means to train competent surgeons.

Numerous methods of training and assessment have come under increased scrutiny in order to better comply with the ACGME mandate. Several studies recently published, have looked at the effects of teaching and evaluation methods such as simulators, video based assessments, learning styles, and assessment tools.3 These methods have shown great promise and have helped pave the way to a competency-based education. However, there still remains a need for a structured curriculum development for a meaningful implementation of these methods into the residency programs.

Temporal bone courses are conducted by most of the otolaryngology programs in the country. Several challenges exist regarding implementation of these courses, such as limited access to cadaveric temporal bone and lack of standardization. Additionally, a resident’s rotation can start before experiencing the temporal bone course, making it important to assess the significance of timing of the course so that appropriate actions can be taken to improve this aspect of resident education.

CONCLUSIONS

Our results indicate that the residents who perform mastoidectomy surgeries in the operating room after the temporal bone course have better scores. These results suggest that teaching hospitals should have more educational opportunities for residents for a greater improvement and retention of surgical skills. This can potentially be achieved by implementing smaller supplemental courses throughout the educational year and the use of virtual reality simulation.

REFERENCES