

Should the pre-doctoral oral and maxillofacial surgery curriculum include an operating room rotation? A survey of third year dental students

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Abstract

Introduction and Objectives: An operating room rotation for predoctoral dental students can have many potential benefits, both for the students and for the specialty of oral and maxillofacial surgery (OMS). The purpose of this study was to determine the relevance and value of such a rotation for a group of 3rd year dental students.

Subjects and Methods: In this prospective study, third year dental students completed a voluntary, anonymous questionnaire prior to and after a 2 day operating room rotation. Data collection included the student's perception of the scope of practice for OMS, their level of satisfaction with the rotation and its perceived value, and whether the rotation-specific educational objectives were met.

Results: Fifty-seven of 98 eligible students answered both questionnaires. More than 80% of students were already familiar with the scope of OMS prior to the rotation. Following the rotation, greater than 90% indicated that they had a better understanding of procedures, were better equipped to refer patients for advanced procedures, and that the rotation was valuable to their dental school experience. A similar number also reported favorable interactions with the residents and attending staff. The rotation-specific objectives and student expectations were generally met, except that nearly 24% would have preferred more hands-on experience. A majority of students also preferred more time in the operating room (OR).

Conclusion: The results of this study indicate that students perceive a rotation through the operating room as valuable, giving them a better understanding of OR protocol and procedures, improving their knowledge of various surgical operations, and making them feel better prepared to refer patients for advanced OMS procedures.

Keywords: Predoctoral curriculum, Operating room rotation

Introduction

Reports on the value of predoctoral student exposure to the specialty of oral and maxillofacial surgery (OMS) in the operating room (OR) setting are generally lacking. There are occasional reports relating to medical student curricula in operating room protocols,^(1,2) and Dennis⁽³⁾ has noted the need for hospital and OR exposure in dental education.

The potential benefits of such rotations are multifold for both the student and the specialty of oral and maxillofacial surgery. These benefits include:

- Defining and demonstrating to students the breadth of the scope of OMS via first-hand exposure to major surgery.
- Reinforcement of basic surgical skills such as suturing and exodontia.
- Developing familiarity with basic OR protocol, including sterile technique, gloving and gowning, etc.
- Mentoring of students who may have declared an interest in OMS as a specialty, or developing that interest in other students.
- Providing students with knowledge that will better enable them to educate their own patients regarding advanced or major surgical procedures, including indications and expectations related to the surgery.

The purposes of this study were:

1. To determine whether the specific objectives of an OR rotation as defined in the course syllabus (Fig. 1) were successfully met;
2. To determine if students felt there was value in the operating room rotation;
3. To determine whether the rotation changed the student's perspective regarding the scope of contemporary OMS.

It was hypothesized that the objectives of the rotation would be met, that students would judge the rotation as beneficial to their dental education, and that the rotation would broaden the student's perception of the scope of contemporary OMS.

Subjects and Methods

The project was approved by the Institutional Review Board of Virginia Commonwealth University. Ninety-eight third year students enrolled at Virginia Commonwealth University School of Dentistry were asked to complete an anonymous pre-rotation questionnaire regarding their OR rotation expectations and their current understanding of the scope of oral and maxillofacial surgery (Fig. 2). The students were then assigned to spend 2 days* making rounds with the oral and maxillofacial surgery residents and in the operating room. Upon completion of their rotation, they were asked to complete a second questionnaire that repeated the same questions about scope and additionally had specific questions regarding their involvement in the

operating room, things they might have learned, and their evaluation of the benefits of the experience (Fig. 3). The questionnaires were numbered so that the pre and post-rotation forms could be matched, and researchers were blinded with respect to student identity. All pre-rotation surveys were distributed and collected on a single date (August 27, 2015), and post-rotation surveys were distributed and completed immediately following the student's operating room experience (between September 11, 2015 and May 2, 2016).

The results were tabulated after all students had completed their rotation, and McNemar's test for paired data was used to determine whether student perceptions and knowledge of the specialty changed as a result of the rotation. A mid p variation was used because of the low prevalence of the off-diagonal elements. All analyses were performed in R (version 3.3.1) with a 0.05 significance level.

*In total, students at VCU School of Dentistry spend 5 weeks assigned to Oral and Maxillofacial Surgery rotation, 3 weeks in their 3rd year and 2 weeks in their 4th year.

Results

Fifty-seven of the 98 students completed the pre- and post-rotation questionnaire, for a response rate of 58%. The first 13 questions assessed students' knowledge of the scope of practice for OMS. More than 90 percent of the students indicated that 8 of the 13 listed procedures would typically be performed by oral and maxillofacial surgeons, and more than 80 percent indicated that 12 of 13 procedures were within the scope of practice (Table 1). For the majority of procedures, the rotation did not change the students' perceptions. However, a small number did change their opinion negatively regarding salivary gland surgery and harvesting of bone grafts from the hip. Also, a small number of respondents reversed their opinion from positive to negative or vice versa for tonsillectomy and nerve repair.

The next section of the survey assessed students' expectations of the value of the rotation and whether key course objectives were met (Table 2). Fifty-five of the 57 students (96%) felt that they had a better understanding of OMS procedures after the rotation. However, there

was a significant difference in the pre and post-rotation responses regarding involvement in the surgeries and learning how to scrub, gown and glove for OR procedures (p-value<0.001 for both). Fourteen of the students who originally felt they would be involved in the surgery responded "No" on the follow-up, indicating an unfulfilled expectation. Twelve of the respondents who expected to learn how to scrub also did not feel their expectations were met. Conversely, there were 8 individuals who did not expect sufficient OR time but reported adequate involvement at follow-up. All but one student reported learning more about OR protocol.

The interaction of the students with residents and the attending staff is summarized in Fig. 4. Fifty-four students (95%) expected that the resident would explain each case to them, and this expectation was met, with 53 (93%) reporting that residents routinely supplied such information. Fifty-four students (95%) reported receiving descriptions of the procedures, 52 (91%) reported a discussion of the rationale for treatment, and 50 (88%) reported hearing about the surgical anatomy related to the procedures.

More than 90 percent of students felt that their OR rotation was a valuable experience, that the rotation would better equip them to explain surgical procedures to their patients, and that the rotation gave them a broader knowledge of the types of patients who could be referred for surgery. Despite the majority responding that the rotation was valuable, only 69% felt it involved an appropriate amount of time. The remaining third of students felt there was too little exposure (n=16) and only one reported that it was too much. Among those who felt the exposure was too little, comments indicated a desire for exposure to a wider variety of procedures, especially the more complex surgeries.

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| • Define the broader scope of oral and maxillofacial surgery, including both simple and complex procedures |
| • Recognize and distinguish cases that may require referral to an oral and maxillofacial surgeon |
| • Demonstrate operating room protocol, including sterile technique, gloving and gowning |

Fig. 1: Educational Objectives Related to OR Rotation

| Survey for D3 Students Prior to or Rotation | | | |
|---|--|-----|----|
| Circle Yes or No | | | |
| 1 | Do oral and maxillofacial surgeons (OMFS) perform facial cosmetic surgery? | Yes | No |
| 2 | Do OMFS correct facial deformities? | Yes | No |
| 3 | Do OMFS correct facial deformities? | Yes | No |
| 4 | Do OMFS perform salivary gland surgery? | Yes | No |
| 5 | Do OMFS perform tonsillectomy procedures? | Yes | No |
| 6 | Do OMFS perform grafting procedures with bone harvested from the hip? | Yes | No |

| | | | |
|----|--|-----|----|
| 7 | Do OMFS perform nerve repair procedures? | Yes | No |
| 8 | Do OMFS perform nerve repair procedures? | Yes | No |
| 9 | Do OMFS perform tumor resection and jaw reconstruction? | Yes | No |
| 10 | Do OMFS repair frontal sinus fractures? | Yes | No |
| 11 | Do OMFS treat nasal bone fractures? | Yes | No |
| 12 | Do OMFS treat orbital fractures? | Yes | No |
| 13 | Do OMFS place dental implants? | Yes | No |
| 14 | Do you think this rotation will help you better understand the scope of OMFS? | Yes | No |
| 15 | Do you expect to be actively involved in surgeries in the OR? | Yes | No |
| 16 | Do you expect to learn more about OR protocol and procedure? | Yes | No |
| 17 | Do you hope to learn how to scrub, gown and glove for the OR? | Yes | No |
| 18 | Do you expect that the attending or resident will explain the patients' diagnosis, rationale procedure and relevant surgical anatomy? | Yes | No |
| 19 | Do you expect to be familiar (from previous lectures) with the procedures done in the OR? | Yes | No |
| 20 | Do you expect the OR rotation to be valuable for you as a dental student? | Yes | No |
| 21 | Do you expect that the OR rotation will help you to better communicate with your patients who may be considering surgery in the OR setting? | Yes | No |
| 22 | Do you expect that the OR rotation will help you to be more knowledgeable with respect to the types of patients who might benefit from referral to the OMFS? | Yes | No |

Fig. 2: Pre-rotation Survey

| Survey for D3 Students after or Rotation | | | |
|--|--|-----|----|
| Circle Yes or No | | | |
| 1 | Do oral and maxillofacial surgeons (OMFS) perform facial cosmetic surgery? | Yes | No |
| 2 | Do OMFS correct facial deformities? | Yes | No |
| 3 | Do OMFS correct cleft lip and/or palate deformities? | Yes | No |
| 4 | Do OMFS perform salivary gland surgery? | Yes | No |
| 5 | Do OMFS perform tonsillectomy procedures? | Yes | No |
| 6 | Do OMFS perform grafting procedures with bone harvested from the hip? | Yes | No |
| 7 | Do OMFS perform nerve repair procedures? | Yes | No |
| 8 | Do OMFS perform TMJ replacement with prosthetic joints? | Yes | No |
| 9 | Do OMFS perform tumor resection and jaw reconstruction? | Yes | No |
| 10 | Do OMFS repair frontal sinus fractures? | Yes | No |
| 11 | Do OMFS treat nasal bone fractures? | Yes | No |
| 12 | Do OMFS treat orbital fractures? | Yes | No |
| 13 | Do OMFS place dental implants? | Yes | No |

| | | | |
|----|--|----------|---------------------------|
| 14 | Did this rotation help you to better understand the scope of OMFS? | Yes | No |
| 15 | Were you actively involved in some of the surgeries? | Yes | No |
| 16 | Did you learn more about OR protocol and procedure? | Yes | No |
| 17 | Did you learn how to scrub, gown and glove for the OR? | Yes | No |
| 18 | Did the attending and /or resident explain the following to you: | | |
| A | Patient's diagnosis? | Yes | No |
| B | Nature of the surgical procedure? | Yes | No |
| C | Rationale for treatment? | Yes | No |
| D | Surgical anatomy? | Yes | No |
| 19 | Do you consider the OR experience to be an important rotation for dental students? | Yes | No |
| 20 | Did the OR rotation help you to be better prepared to communicate with your patients who may be considering surgery in the OR setting? | Yes | No |
| 21 | Did the OR rotation help you to become more knowledgeable regarding the types of patients who might benefit from referral to the OMFS? | Yes | No |
| 22 | Please indicate the date of your rotation | | |
| 23 | Was amount of exposure to the OR (circle your response) | Too Much | About Right Too Little |
| 24 | Please make any additional comments in the space below | | |

Fig. 3: Post-rotation Survey

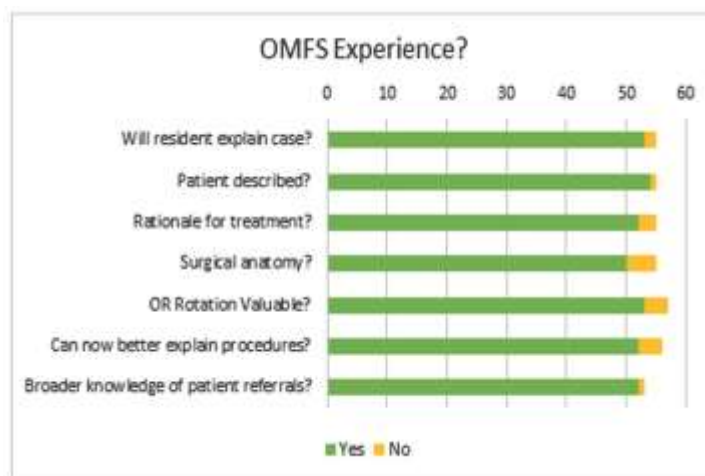


Fig. 4: Student responses to post rotation outcome questions

Table 1: Student responses to OMS scope questions, pre and post rotation

| | Yes-Yes | No-Yes | Yes-No | No-No | P-Value* |
|-------------------------------------|---------|--------|--------|-------|----------|
| Q1: Perform cosmetic surgery? | 55 | 1 | 1 | 0 | 0.2500 |
| Q2: Correct facial deformities? | 55 | 1 | 0 | 1 | 0.5000 |
| Q3: Correct CLP? | 53 | 0 | 2 | 2 | 0.2500 |
| Q4: Perform salivary gland surgery? | 50 | 2 | 4 | 1 | 0.0156 |

| | | | | | |
|---|----|---|---|---|--------|
| Q5: Perform tonsillectomy? | 38 | 5 | 5 | 9 | 0.0009 |
| Q6: Perform grafting with bone harvested from hip? | 50 | 1 | 4 | 2 | 0.0313 |
| Q7: Perform nerve repair procedures? | 48 | 4 | 4 | 1 | 0.0039 |
| Q8: TMJ replace with prosthetic? | 51 | 2 | 2 | 2 | 0.0625 |
| Q9: Perform tumor resection and jaw reconstruction? | 55 | 0 | 1 | 1 | 0.5000 |
| Q10: Correct frontal sinus fracture? | 55 | 1 | 1 | 0 | 0.2500 |
| Q11: Correct nasal bone fracture? | 54 | 1 | 2 | 0 | 0.1250 |
| Q12: Correct orbital fracture? | 53 | 1 | 2 | 1 | 0.1250 |
| Q13: Place dental implants? | 54 | 0 | 2 | 1 | 0.2500 |

*P-value from Associated McNemar's Mid-P test for symmetry

Table 2: Student responses regarding expectations and course objectives, pre and post

| | Yes-Yes | No-Yes | Yes-No | No-No | P-value* |
|---|---------|--------|--------|-------|----------|
| Q14: Will rotation help you better understand OMFS? | 53 | 2 | 1 | 1 | 0.1250 |
| Q15: Expect to be involved in surgeries in OR? | 24 | 8 | 14 | 11 | <0.0001 |
| Q16: Expect to learn more about OR protocol? | 55 | 1 | 1 | 0 | 0.2500 |
| Q17: Hope to learn how to scrub in OR? | 45 | 0 | 12 | 0 | 0.0002 |

*P-value from Associated McNemar's Mid-P test for symmetry

Discussion

The purposes of having an OR rotation for dental students are to better familiarize them with the scope of the specialty, to have them learn about OR protocol and proper scrubbing and gowning, and to have them become more informed about specific operations so that they will be better able to communicate with patients who may be potential candidates for such procedures. The results of this study indicate that most of these goals are achieved. However, although one of the objectives was to have students gain a better appreciation of the scope of the specialty, it was of interest to note that most students already were well informed and that their perceptions did not change dramatically as a result of the OR rotation. Prior studies^(4,5) have demonstrated that dental students accurately assess the scope of practice for most procedures, including third molar extractions, reconstructive and orthognathic surgery, implants, cleft surgery, and TMJ surgery. This is important since they represent the future specialty referral base.

The benefits of an OR rotation were clearly demonstrated by well over 90% of responding students indicating that the rotation was a valuable educational experience, gave them a better understanding of complex maxillofacial procedures, and made them more familiar with OR protocol and procedures. A similar number reported favorable interactions with residents and attending staff during their rotation, and they indicated

that the rotation would better enable them to discuss surgical procedures and make appropriate referrals of their own patients. However, one-third of the students felt that the 2 days were an insufficient time for exposure to the operating room and approximately one-fourth reported inadequate time for hands-on experiences such as scrubbing and gowning and involvement in surgery. The value of practical, hands-on experience, as opposed to pure didactics, is well documented in medical education.^(1,2,6)

One of the inherent problems in structuring an undergraduate rotation in the OR setting is the difficulty in offering a standardized experience for all students.⁽⁷⁾ Surgeons vary in their willingness to teach and in their pedagogical philosophies and techniques. Moreover, there is an inherent "pressure to produce" in most settings, which also impacts an attending surgeon's willingness to devote time and energy to predoctoral teaching in the OR setting. Also, the relatively short duration of the OR rotation means that there will be a certain randomness regarding what procedures an individual student actually observes. Despite these weaknesses, it is evident that an OR experience is beneficial for dental students. However, it would appear that it would be advantageous for the time spent to be more than 2 days so that students are exposed to a greater variety of cases and have more time to learn OR protocol.

The importance of the role model in student development is also well established, and an OR rotation exposes the students to multiple attending surgeons. Wright⁽⁸⁾ reported that personality, clinical skills, clinical competence and teaching ability were most important to students in identifying role models, and that the role models identified by students strongly influenced what clinical specialty was chosen for residency training. As recently noted by Hupp,⁽⁹⁾ mentoring is critical to the future of the specialty of oral and maxillofacial surgery, especially in our current and changing environment where there are numerous challenges to ongoing recruitment of highly qualified residents.

One of the weaknesses of this study (and of the OR rotation itself) is that student experiences vary so much, based on the attending and resident staff to whom they are assigned and on the wide variation in procedures performed on any given day. The scheduling variability can be mitigated to a certain extent by requiring students to attend Grand Rounds during their entire OMS rotation, so that the breadth of cases performed by the department is demonstrated. Furthermore, if the pedagogical philosophy of the department places appropriate emphasis on undergraduate education, this philosophy should tend to pervade the entire department, so that students will experience and report favorable interaction with both residents and attending staff. Such was the case in our student sample. This is important not only for the student, but also for the specialty, as these students represent the future referral base for oral and maxillofacial surgeons.

Conclusion

An OR rotation is clearly beneficial for all dental students and should be incorporated into the curriculum in those oral and maxillofacial surgery departments in which it is currently not being done. To assure its effectiveness, it is important for the program to have the proper support of the faculty and their understanding of its intent. Based on the findings from this study, its effectiveness may be also be improved by involving more than 2 days.

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