



Strategies to overcome limitations in Otolaryngology residency training during the COVID-19 pandemic

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Received: 18 June 2020 / Accepted: 17 July 2020 / Published online: 23 July 2020
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Abstract

Purpose The COVID-19 pandemic has produced an unequalled human crisis forcing a radical reorganization in the healthcare system. Otolaryngologists are at high risk of exposure, and changes in medical and surgical activities have reduced the learning opportunity for residents and fellows. We believe that even during COVID-19 crisis it is mandatory to guarantee an optimal training, and here, we propose some strategies, based on our experience, to further increase our trainees' learning curve.

Methods We asked our trainees to fill out an electronic survey about several aspect of their training: a first section focused on the reduction of clinical activities and the perceived impact of the pandemic on residents' skills; the second part outlined the type of attended training activity and the perceived benefit.

Results Surgical training has been reported by our residents as the activity perceived to be the most contracted during the pandemic. According to residents' opinion the most useful activities were dissection ($n=8$, 53.4% residents) and online journal clubs/webinars ($n=7$, 46.6% of residents). Residents' suggestions included actively participating to tracheostomy procedures on SARS-CoV-2 positive patients, attending lessons held by senior consultants on basic ENT topics and promoting collegial discussion of inpatient clinical cases.

Conclusion Building on this dramatic experience, we must be ready for a global restructuring of the residency program to provide an adequate trainee education for the future surgeons.

Keywords Otolaryngology · Training · Residency · Covid-19 · Cadaver dissection

Introduction

Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is leading to a human, economic and social crisis attacking societies at their core. The World Health Organization (WHO) defined COVID-19 as a pandemic that infected 6.2 million people, causing 376,320 deaths as of June 02, 2020. Italy has been one of the most affected countries with more than 33,000 confirmed deaths [1]. Given that there is no specific treatment or vaccine for SARS-CoV-2, social distancing measures (SDM) appear to be those with the strongest scientific validity to prevent the spread of the disease [2]. Hence, there have been clear consequences in the planning of daily clinical activities. Based on the recommendations given by multiple scientific societies [3, 4], hospitals are admitting only urgent and emergent cases with 70% of chief surgeons reporting a 50–90% decrease of elective surgical cases [5, 6]. The reduction of outpatient and surgical activities occurred

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in all surgical fields but concerns about SARS-CoV-2 transmission during transnasal surgery [4, 7], and potentially any procedure involving the upper airways, contributed to a further slowing of activities in Otolaryngology departments. All measures to prevent the transmission of SARS-CoV-2, combined with the redistribution of human resources, have drastically reduced the learning opportunities for resident and fellows.

The purpose of this article is to report our experience in a tertiary care center, in terms of strategies to overcome the educational constraints caused by COVID-19. Besides a description of the learning methods implemented during the pandemic, the study reports the perceived impact of COVID-19 on residents and the relevance of alternative training approaches.

Materials and methods

All ENT residents of the University of Insubria (Varese, Italy) were asked to fill out an electronic survey during the last week of the most restrictive measures of social distancing (May 11–15). General information such as age, gender, year of residency and hospitals of attendance in the period March–April 2020 were collected. The survey investigated several aspects: a first section focused on the reduction of clinical activities and the perceived impact of the pandemic on residents' skills; the second part outlined the type of attended training activity and the perceived benefit. Each question was scored on a scale 0–5 to define the severity of a problem (0—Absent, 1—Very mild, 2—Mild, 3—Moderate, 4—Important, 5—Most important), the frequency of attendance (0—Less than 5%, 1—Between 5 and 25%, 2—Between 25 and 50%, 3—Between 50 and 75%, 4—Between 75 and 95%, 5—More than 95%) or the utility of the training method (0—No, 1—Very low, 2—Low, 3—Moderate, 4—High, 5—Very High). In addition, all residents reported (i) the most useful educational activity, (ii) the prevalent anatomical site studied during dissection training and (iii) proposals to improve training during pandemic.

Results

A cohort of 15 residents was examined. 6 were female and 9 were male (M:F = 1.5). The mean age was 29.4 ± 2.4 years. The group includes different years of residency: 7 (46.6%) were on the first year, 3 (20%) on the second year, 3 (20%) on the third year and 2 (13.4%) on the fourth year. Ten residents (66.6%) attended the main hub of the residency program (4 at first, 2 at the second, 3 at third, and 1 at fourth year of residency, respectively), being the hospital of Varese, during March–April 2020, while 5 residents attended 3

different affiliated hospitals, being part of the rotation program: 3 residents (20%) frequented the Hospital of Como (at first, second and fourth year of residency, respectively), 1 resident (6.6%) attended the Hospital of Busto Arsizio (at first year) and 1 resident (6.6%) attended the Hospital of Monza (at first year). Results of the survey are reported in Table 1. According to residents' opinion, the most useful activities were dissection ($n = 8$, 53.4% residents) and online journal clubs/webinars ($n = 7$, 46.6% of residents). The prevalent anatomical sites studied during dissection sessions were the nasal and paranasal sinuses (70%), the oral cavity (20%) and neck (10%). Residents' suggestions included actively participating to tracheostomy procedures on SARS-CoV-2-positive patients, attending lessons held by senior consultants on basic ENT topics and promoting collegial discussion of inpatient clinical cases.

Discussion

The COVID-19-induced limitations entail a substantial overhaul of the various facets of the training activity in Otolaryngology, with an even more complex task in a period where receiving correct information about the virus, facing the fear of infection and having adequate personal protective equipment (PPE) are crucial elements in the management of the pandemic (Table 1—Q1, Q2, Q3).

As reported by the cohort of residents included in the study, there is a perceived reduction of all learning activities with a general concern that COVID-19 may have a negative impact on final skills, more evident among senior residents (Table 1—Q9, Q10).

Clinical activity

Inpatients and outpatients care during COVID-19 pandemic must respect two essential points: (i) the use of proper PPE with respect of SDM and (ii) the planning of dedicated shifts both to reduce exposure and to prevent the spread of the virus among healthcare workers. Wearing disposable FFP2/N95 masks, water-resistant gown, gloves, goggles, cap and full-face visor shield are now considered imperative, especially dealing with patients with unknown COVID-19 status [3, 4]. Moreover, clinical examination must be performed with as few as possible healthcare workers in the room. In our experience, the staff performing daily clinical examinations is composed by one supervisor (that can be either an attending or a senior resident), one resident (that can be either a senior or a junior resident), one nurse and the patient alone without any relatives or accompanying persons [8, 9]. However, a reduction of all clinical activities was reported (Table 1—Q5, Q6, Q7). An interesting proposal, also applied in other surgical divisions, is to organize

Table 1 Self-reported questionnaire and results for each year of residency

	Y 1 n=7	Y 2 n=3	Y3 n=3	Y4 n=2	Total n=15
Impact of COVID-19 in clinical activity <i>The higher the score, the more severe the problem</i>	<i>Mean ± Std. dev.</i>				
1. Properly informed about COVID-19	3.4 ± 0.9	3.3 ± 1.5	4 ± 1	3 ± 0	3.4 ± 0.9
2. Fear of contracting SARS-CoV2	3.2 ± 1	3 ± 1	3.6 ± 1.5	2.5 ± 0.7	3.2 ± 1
3. Inadequate protection against SARS-CoV2 exposure	2.7 ± 1.4	3.3 ± 0.5	3.6 ± 0.5	2.5 ± 2.1	1 ± 1.2
4. Inadequate skills in relation of your year of residency	2.4 ± 1.2	3 ± 0	3 ± 1	4 ± 0	2.8 ± 1
5. Reduction of global learning during pandemic	4.4 ± 0.7	4.3 ± 1.1	5 ± 0	4 ± 0	4.4 ± 0.7
6. Reduction of learning activity in the inpatient clinic	4.1 ± 1	4 ± 1	4.3 ± 0.5	3 ± 1.4	1 ± 1
7. Reduction of learning activity in the outpatient clinic	4.1 ± 0.7	4.3 ± 1.1	4.3 ± 0.5	2 ± 1.4	3.9 ± 1
8. Reduction of surgical training during pandemic	4.4 ± 1	4.3 ± 1.1	5 ± 0	5 ± 0	4.6 ± 0.8
Effects on training <i>The higher the score, the more severe the problem</i>					
9. Impact of COVID-19 on your global training	3.2 ± 1.1	3 ± 1	5 ± 0	4 ± 0	3.7 ± 1
10. Impact of COVID-19 on your surgical skills	3 ± 1	3 ± 1	4.3 ± 0.5	3.5 ± 0.7	3.3 ± 0.9
Alternative learning <i>The higher the score the higher the attendance or utility of training</i>					
11. Perceived utility of alternative learning methods	3.5 ± 0.8	3 ± 1	3.3 ± 0.5	3.5 ± 0.7	3.4 ± 0.7
12. Frequency of activity in dissection lab	4 ± 0.5	3.3 ± 0.5	3.6 ± 0.5	3.5 ± 0.7	3.7 ± 0.5
13. Utility of dissection lab training	3.5 ± 1.7	4 ± 1	4.6 ± 0.5	4 ± 0	3.9 ± 1.2
14. Online Journal Club/lectures attendance	2.8 ± 0.9	2.3 ± 0.5	4 ± 1	3 ± 0	1 ± 0.9
15. Utility of online learning	3.5 ± 0.9	3.6 ± 0.5	4.3 ± 0.5	3.5 ± 0.7	3.7 ± 0.8
16. Participation to in-house tumor board	2.7 ± 1.9	3 ± 2.6	4 ± 1	4.5 ± 0.7	3.2 ± 1.8
17. Utility of online tumor board	3.3 ± 1.6	3 ± 2	3 ± 1	3.5 ± 0.7	3.2 ± 1.37

independent teams of residents able to support inpatient, outpatient and surgical activities [10]. Therefore, we planned different resident groups rotating between different activities, so that not all residents are present at the same time in the same place [11].

This combination of strategies has proved successful because at the time of collection of the questionnaire none of our residents contracted SARS-CoV-2 infection.

Surgical training

During COVID-19 breakout we have experienced a sharp decrease in elective surgery with a consequent notable limitation of the practice chances for residents and fellows [12]. Surgical training has been reported by our residents as the activity perceived to be the most contracted during the pandemic (Table 1—Q8). In this scenario, it is extremely important to find alternatives to ensure surgical skills implementations such as step-by-step video-surgery and online workshops that anyway help only partially the practical training of surgeons.

Therefore, our dissection lab (DL) has gained a pivotal role in the training of surgical anatomy and techniques [13]. As reported by our residents, DL activities are the most useful learning methods to improve their skills during the

pandemic (Table 1—Q13). In DL it is possible to mimic surgical procedures in complete security, respecting SDM [6]. DL setting allows senior consultants to supervise attending or senior residents performing step-by-step surgical procedures and to explain anatomy and technical notes to junior residents. It can also provide video material which can be edited and shared with other centers to be used for training. Moreover, DL allows in-depth anatomical and surgical knowledge in different subsites, and we were able to focus on nasal and paranasal sinuses (70%), oral cavity (20%) and neck (10%).

Another option is live surgery, where residents and fellows can follow the operation being performed live via videoconferencing, without being physically present in the operating room.

Multidisciplinary management of oncological patient

The head and neck oncologic care is very complex and requires a multidisciplinary team approach that needs to be upheld. To date, supported by the technology, we were able to plan virtual multidisciplinary tumor boards with the same frequency as before, once a week. Each resident, supervised by an attending, prepares the clinical cases which are going

to be discussed and sends the list to all the participants in order that everyone is informed. All participants connect to the intranet system, which allows consultation of data concerning the clinical case, and during the weekly online videoconference, draw-up the interdisciplinary report. Residents and fellows can participate in teleconferencing to the virtual tumor board and learn from it [14].

Didactic education

The last but not the least aspect of the training is the didactic. Frontal lectures, journal clubs, and case conferences are also important during residency and fellowship, but cannot be attended in person in respect of the SDM. Video lectures and grand rounds can be delivered through many electronic platforms where people are able to follow the lecturer and be actively involved in discussion. The different referral centers for specific otolaryngologic domains should offer lectures or surgical videos to be shared. Fellowship can be conducted in the same way: fellows can follow all the departmental activities through these instruments and by implementing surgical techniques discussion with the faculty members with video demonstrations [15].

Conclusions

We are facing unprecedented times right now which brought unexpected consequences hitherto. The changes in our daily practices are evolving, but it is necessary to reformulate a plan in order to guarantee the best management for the patients and guarantee the continuity of the residents' training and education in ENT. Setting up independent teams of residents and limiting exposure opportunities resulted in a sound strategic combination of maintaining clinical practice while preserving trainees' safety. The dissection activity is the best way to maintain the learning curve of surgical skills and therefore must be implemented when possible. As reported by our residents, on-line journal clubs/webinars were the second most important activity during pandemic; moreover, online lectures had the advantage of sharing knowledge among different centers, preventing the isolation of the single institution and maintaining an active encouragement in the production of didactic material.

Acknowledgements MTZ is a Ph.D. student of the "Biotechnologies and Life Sciences" course at Università degli Studi of Insubria, Varese, Italy.

Compliance with ethical standards

Conflict of interests No conflict of interests or funding has been disclosed for this article.

Ethical approval No ethical approval or informed consent was needed for this type of article.

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