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SPECIAL ARTICLE COVID-19

COVID-19 Pandemic and its Impact on the Management of Head and Neck Cancer in the Spanish Healthcare System.

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Abstract

Introduction Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has represented a major challenge for healthcare systems worldwide, changing the habits of physicians. A reorganization of healthcare activity has been necessary, limiting surgical activity to essential cases (emergencies and oncology), and improving the distribution of health resources.

Objective To analyze the impact of the COVID-19 pandemic on head and neck cancer surgery management in Spain.

Methods A cross-sectional study, through an anonymous and voluntary online survey distributed to 76 Spanish otorhinolaryngology departments.

Results A total of 44 centers completed the survey, 65.9% of which were high-volume. A total of 45.5% of them had to stop high-priority surgery and 54.5% of head and neck surgeons were relocated outside their scope of practice. Surgeons reported not feeling safe during their usual practice, with a decrease to a 25% of airway procedures. A total of 29.5% were "forced" to deviate from the "standard of care" due to the epidemiological situation.

Conclusions Approximately half of the departments decreased their activity, not treating their patients on a regular basis, and surgeons were reassigned to other tasks. It seems necessary that the head and neck surgeons balance infection risk with patient care. The consequences of the reported delays and changes in daily practice should be evaluated in the future in order to understand the real impact of the pandemic on the survival of head and neck cancer patients.

Keywords
- COVID-19
- coronavirus
- otolaryngology
- aerosol generating procedures
- personal protective equipment
- cancer treatment
- head neck surgery
- mortality
- morbidity

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Introduction

Since its declaration as a Public Health Emergency of International Concern on 30 January, 2020, by the World Health Organization (WHO),[1] the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has represented a major challenge for healthcare systems worldwide, changing the way we understand medicine.[2] The exponential increase in cases since the first patient diagnosed in Spain (January 31, 2020) and the overload of primary and hospital care meant a great effort for society.[3,4] It was necessary to adapt the public health system to the epidemiological situation, reorganizing hospitals and restructuring primary care, limiting surgical activity to essential cases (emergencies and oncology), and improving the distribution of health resources (human, material, and structural).[5–9]

All these logistical challenges have led to the reduction or to the temporary suspension of almost all elective surgical activity in many centers affected by the pandemic.[10–13] This represents a serious problem in the case of oncological diseases in relation to their prognosis, morbidity and mortality,[14–16] and whose repercussions we are already beginning to suffer in our field.[17,18] In particular, surgery for head and neck (H&N) tumors consists of high-risk procedures for surgeons and other health workers because the operation field is on possible locations of SARS-CoV-2,[19] such as the upper respiratory tract.[7,12]

To date, there are few reports about the real situation of H&N cancer management during the pandemic,[16,17] and almost all the evidence comes from individual reports without addressing the situation in the Spanish healthcare system. The aim of the present study is to analyze the impact of the COVID-19 pandemic on H&N cancer surgery management in Spanish otorhinolaryngology – H&N surgical departments.

Material and Methods

An initial call for participation was sent out to Spanish regional members of the Young Otolaryngologists – International Federation of Otolaryngologic Societies (YO-IFOS) to act as representatives.[20] A cross-sectional study, assessing the impact of the COVID-19 pandemic on the activity of H&N oncological surgery was designed. A total of 76 otorhinolaryngology departments in Spain, all of them with accredited resident intern training, were eligible for participation in the survey. Details were reviewed by the respective country representatives to ensure that there was no duplication of data.

The data collection was carried out through an anonymous and voluntary online survey between March 15th 2020 and May 15th 2020, provided on 2 occasions to a representative from each department during this period by the *Sociedad Española de Otorrinolaringología – Cirugía de Cabeza y Cuello* (SEORL-CCC), where the characteristics of the study and purpose were informed. The survey was created with Survey Monkey (Survey Monkey, San Mateo, California, USA), so that each participant could complete the survey only once. The survey itself was developed in an iterative fashion, with drafts revised by the H&N Study Group of YO-IFOS and the H&N Reconstructive Surgery Working Group – H&N and Skull Base Commission of the SEORL-CCC, which include numerous certified H&N surgeons. In the final version of the survey, there were 27 questions divided into 5 sections: sociodemographic (5), office/clinic practice (7), surgery (11), and other treatment modalities (4). The survey included questions that addressed the status of the oncological surgery, outpatient activity, surgeon roles, volume, and treatment modalities, and protection measures, through dichotomous and/or categorical responses with a single possible option according to the Likert methodology.[21]

Statistical Analysis

Statistical analysis was performed with IBM SPSS Statistics for Windows, version 24.0 (IBM Corp., Armonk, NY, USA). Statistical tests were 2-tailed with a 95% confidence interval (CI). Incomplete responses were excluded from the analysis. Normality was evaluated by the Kolmogorov-Smirnov test, and variances using the Levene test. Qualitative variables were expressed as frequency and percentage. The differences between groups were evaluated by the χ^2 test, the Fisher exact test, or by its variants as appropriate.

Results

A total of 44 hospitals completed the survey; there were 21 (47.7%) academic, 19 (43.2%) nonacademic, and 4 (9.1%) private hospitals. Most of these centers ($n = 29$; 65.9%) was considered, according to the volume of cases before the COVID-19 pandemic, as high-volume ($\geq$ 50 cases per year). The remaining 10 (22.7%) were moderate-volume (between 22 and 49 cases per year), and 5 (11.4%) were low-volume (between 0 and 21 cases per year).

Regarding the activity performed by H&N surgeons (HNS), more than half of the centers surveyed ($n = 24$; 54.5%) reported that, in order to take care of patients affected by COVID-19, they were relocated outside the H&N surgery scope of practice (working as staff in the intensive care unit [ICU], emergency room, COVID-19 units, other surgical disciplines and medical disciplines etc.) during this period. Likewise, a non-negligible percentage ($n = 20$; 45.4%) reported not feeling safe in their job as HNS during the COVID-19 pandemic, stating that the adjustments made by its their institution and local authority were not safe regarding H&N cancer management ($n = 18$; 40,9%).

Office/Clinical Practice

The previsit SARS-CoV-2 symptoms screening was not standardized; it was done in 19 centers (43.2%), it was not done in 24 (54.5%), and it was unknown in 1 (2.3%). The implementation of teleconsultation during the pandemic was analyzed. Most of the first consultations remained in-person in 30 of the centers (68.2%), as well as follow-up visits ($n = 40$; 90.9%). Going deeper into this question, 14 centers (31.8%) maintained between 75 and 100% of the first visits in person, 7 (15.9%) between 50 and 75%, 14 (31.8%) between 25 and

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Table 1 Percentage of complex procedures in head and neck cancer surgery that were performed during the pandemic compared with the previous situation

	Transoral laser microsurgery		High-powered drilling or sawing instruments		Transoral robotic surgery		Free flap reconstruction	
	n	%	*n*	%	*n*	%	*n*	%
0–25%	14	**31.8**	20	**45.5**	10	**22.7**	11	**25**
25–50%	6	13.6	4	9.1	2	4.5	4	9.1
50–75%	7	15.9	3	6.8	0	0	3	6.8
75–100%	13	29.5	4	9.1	3	6.8	8	18.2
NA	4	9.1	13	29.5	29	65.9	18	40.9

Abbreviations: N, number of centers; NA, not applicable.

50%, and 9 (20.5%) between 0 and 25%. Regarding the follow-up visits, 7 (15.9%) maintained between 75 and100% of them, 9 (20.5%) between 50 and 75%, 14 (31.8%) between 25 and 50%, and 14 (31.8%) between 0 and 25% ($p = 0.309$). The evaluation of the use of nasofiberscopy in the consultations showed that 28 (63.6%) centers maintained it in between 75 and 100% of the cases for the first visits and only in 17 (38.6%) for the follow-ups ($p = 0.067$).

Head and Neck Surgery

At some point during the pandemic, 20 (45.5%) of the surveyed centers had to stop high-priority oncological surgical activity due to the epidemiological situation. A minority of respondents "strongly agreed" ($n = 9$; 20.5%) or "agreed" ($n = 11$; 25%) that this represented a significant delay in surgeries of this type, compared with 14 (31.8%) who "disagreed", and 10 (22.7%) who "strongly disagreed". "Low-priority" oncologic surgery was stopped in 26 (59.1%) centers due to the epidemiological situation. Most respondents "strongly agreed" ($n = 9$; 20.5%) or "agreed" ($n = 20$; 45.5%) that this represented a significant delay in surgeries of this type, compared with 9 (20.5%) who "disagreed", and 6 (13.6%) who "strongly disagreed". Most of the centers "disagreed" ($n = 20$, 45.5%) or "strongly disagreed" ($n = 9$; 20.5%) that these delays had a negative influence on the prognosis of the patients.

The proportion of highly complex procedures and/or of aerosol producing procedures in H&N surgery performed in each hospital during the pandemic compared with the previous situation was evaluated. The results are shown in ►**Table 1**, noting that most procedures were reduced to < 25% even though, in most centers, SARS-CoV-2 screening was performed prior to any surgical procedure ($n = 41$; 93.18%), both for aerosols producing and nonproducing procedures. The various protocols used for screening a are shown in ►**Table 2**. It is noteworthy that H&N oncology surgery was absolutely contraindicated in SARS-CoV-2-positive patients in 15 (34.1%) of the centers.

Other Treatment Options

The existence of changes in the treatment algorithm for H&N oncology cases was evaluated (►**Table 3**). Half of the surveyed centers found "Strongly agree" ($n = 2$; 4.5%) or "agree" ($n = 20$; 45.5%) that changes have been made during the pandemic. It is concerning that 13 (29.5%) reported that they had been "forced" to deviate from what they consider "standard of care" in the management of H&N oncology cases due to the epidemiological situation. Despite these data, the reported proportion of H&N oncology patients who had a shift from surgery to radiotherapy or chemotherapy-radiotherapy protocols was 0-25% in most centers ($n = 33$; 75%). In 7 centers (15.9%) this shift was observed for 25-50% of the patients and in 4 centers (9.1%) it was observed for 50-75% of the patients.

Discussion

The SARS-CoV-2 pandemic has represented a major challenge for healthcare systems worldwide, changing the way we understand medicine.[2] Various recommendations on the

Table 2 SARS-CoV-2 infection screening protocols used in head and neck cancer surgeries

	Aerosol-generating surgeries		Non-aerosol generating surgeries		*p-value*
	n	%	*n*	%	
1 RT-PCR	29	**65.9**	31	**70.5**	0.978
1 RT-PCR + Chest CT	9	20.5	7	15.9	
2 RT-PCR	3	6.8	3	6.8	
No testing	3	6.8	3	6.8	

Abbreviations: CT, computed tomography; N, Number of centers; RT-PCR, real time polymerase chain reaction.

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Table 3 Elements in the management of head and neck oncology cases negatively affected during the COVID-19 pandemic

	Radiotherapy		Chemotherapy		Investigative work-up	
	n	%	*n*	%	*n*	%
Strongly agree	5	11.4	5	11.4	15	34.1
Agree	8	18.2	10	22.7	14	31.8
Disagree	18	40.9	17	38.6	4	9.1
Strongly disagree	10	22.7	10	22.7	8	18.2
Not applicable	3	6.8	2	4.5	3	6.8

choice of patients, as well as elective and urgent procedures, and the necessary protection measures during the current situation have been published regarding H&N oncological surgery.[7,12,22–25] Despite this, few reports about the current situation regarding H&N oncological surgery exist to date. Therefore, the objective of the present study was to analyze the impact of the COVID-19 pandemic on H&N cancer surgery units in Spain, this being the first study of this kind so far.

The results of the present study revealed that, due to the epidemiological situation, in half of the surveyed centers it was necessary to cease H&N cancer surgery activity. The consequences of these delays and changes in daily practice should be evaluated in the future to understand the real impact of the pandemic on H&N the prognosis of cancer patients. These results are similar to the ones found in countries such as the USA or Italy,[17,26] which could be attributed to a number of reasons; for example, the need to relocate surgeons to other units to treat patients (as it has been seen in the results obtained), or to try to minimize the risk of in-hospital COVID-19 transmission, as well as any postoperative pulmonary complications that may ensue. On the one hand, patients with cancer are at an increased risk of contracting COVID-19 compared with noncancer patients,[15] and the rate of mortality among this patient cohort has been found to be 5.6% compared with 2.3% for the average population.[27] On the other hand, surgical treatment delays have been shown to significantly increase the risk of recurrence and reduce overall survival.[28] Despite this, data have suggested that the 30-day mortality and morbidity were significantly higher in patients undergoing both elective and emergency surgery when SARS-CoV-2 infection was confirmed perioperatively.[29] Therefore, each case must be assessed in a personalized way and H&N surgeons have to triage patient care and balance their decisions with their own safety and that of the support staff. Existing evidence suggests that perioperative infection must be addressed using COVID-19 free circuits rather than avoiding surgery,[30] and in case the patient tested positive, a 4-week delay could be enough depending on clinical status without compromising the prognosis.[31]

Surgery for H&N tumors consists of high-risk procedures because surgeons operate on possible locations of SARS-CoV-2, such as the upper respiratory tract. Its mucous membranes could harbor the virus, and aerosolization of the SARS-CoV-2 may be extremely high during these procedures, particularly when powered instruments are employed.[7,22,25] Therefore, personal protective equipment is mandatory for otorhinolaryngologists and other healthcare workers dealing with H&N cancer patients.[7,12,25] In this sense, it is worrying that, in approximately half of the centers, surgeons did not feel safe or considered that the protection measures adopted were insufficient. This could be one of the reasons for the marked decrease in the performance of these types of procedures, even though most centers perform screening with at least one polymerase chain reaction (PCR) test before any surgery.

The possible risk of infection during upper airway procedures, both in consultations and in the operating room, is a reality in daily practice.[12,13,20,24] Anecdotal reports from Wuhan and Italy suggested that otolaryngologists may be infected at higher rates than colleagues in the same hospitals, and the first reported death of a physician in both China and the United Kingdom was of an otolaryngologist.[20] One of the main techniques in the diagnosis and follow-up of patients with H&N cancer is fibroscopy,[32] a procedure with a high risk of aerosol production,[33–35] although its use in daily clinical practice does not seem to have been affected by the pandemic, maintaining in-person consultations and regardless of the fact that approximately half of the centers do not carry out symptoms screening for COVID-19 prior to the visit.[36]

One of the strengths of the present study is the sample size obtained through the electronic survey, with a response rate of 57.89%, a percentage similar to those of related studies,[37–39] and was completed mostly by centers with a high volume of cases.[40] Therefore, the conclusions of the present study could be considered representative of the situation in Spain. Despite this, there are several limitations involved in a study with this methodology and design. The use of such surveys has been studied and shows that even with a standardized questionnaire the results must be interpreted with caution. Departments with less impact on activity secondary to the pandemic or in regions with a low incidence of COVID-19 could be a negative influence in the motivation to participate in the study. Only 0torhinolaryngology H&N surgical departments with accredited resident intern training were surveyed, so relevant information from other specialties that are also dedicated to H&N cancer surgery, such as maxillofacial surgery, plastic surgery or general surgery, and centers without this type of training

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may have been lost. It is also not possible to know how many departments never received the survey, especially in nonacademic institutions, and thus did not have the opportunity to report. Given that the data was collected via survey and voluntary reporting, there is a bias toward collecting data from departments with mild affectation or with such a degree of affectation that it did not allow them to answer the survey. We tried to mitigate this as much as possible by sending out surveys several weeks after the initial pandemic wave.

Conclusions

On the one hand, findings suggested that 45.5% of the surveyed H&N departments had to stop high-priority oncological surgical activity, 54.5% of the surgeons were reassigned to other tasks outside their scope of practice, and 29.5% of HNS reported that they had been "forced" to deviate from what they consider "standard of care" in the management of H&N oncology cases due to the epidemiological situation. On the other hand, in 45.4% of the centers, the HNS reported not feeling safe in their job, so it seems necessary to assess the infection risk (of patients and of the surgical team) with patient care.

Conflict of Interests
The authors have no conflict of interests to declare.

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References

1 Coronavirus [Internet]. Available in: https://www.who.int/emergencies/diseases/novel-coronavirus-2019 [cited 03.10.20]
2 Mayo-Yánez M. Research during SARS-CoV-2 pandemic: To "Preprint" or not to "Preprint", that is the question. Med Clin (Barc) 2020;155:86–87
3 Situación de COVID-19 o Coronavirus en España. Available in: https://covid19.isciii.es/ [cited 03.10.20]
4 Spiteri G, Fielding J, Diercke M, et al. First cases of coronavirus disease 2019 (COVID-19) in the WHO European Region, 24 January to 21 February 2020. Euro Surveill 2020;25(09): 2000178
5 Coimbra R, Edwards S, Kurihara H, et al. European Society of Trauma and Emergency Surgery (ESTES) recommendations for trauma and emergency surgery preparation during times of COVID-19 infection. Eur J Trauma Emerg Surg 2020;46(03): 505–510
6 Finley C, Prashad A, Camuso N, et al. Guidance for management of cancer surgery during the COVID-19 pandemic. Can J Surg 2020; 63(22):S2–S4
7 Mayo-Yánez M, Calvo-Henríquez C, Lechien JR, Fakhry N, Ayad T, Chiesa-Estomba CM. Is the ultrasonic scalpel recommended in head and neck surgery during the COVID-19 pandemic? State-of-the-art review. Head Neck 2020;42(07):1657–1663. Doi: 10.1002/hed.26278
8 Zhao C, Viana A Jr, Wang Y, Wei H-Q, Yan A-H, Capasso R. Otolaryngology during COVID-19: Preventive care and precautionary measures. Am J Otolaryngol 2020;41(04):102508
9 Fakhry N, Schultz P, Morinière S, et al; French Society of Otorhinolaryngology, Head and Neck Surgery (SFORL) French Society of Head and Neck Carcinology (SFCCF) French consensus on management of head and neck cancer surgery during COVID-19 pandemic. Eur Ann Otorhinolaryngol Head Neck Dis 2020;137 (03):159–160
10 Di Martino M, García Septiem J, Maqueda González R, et al. [Elective surgery during the SARS-CoV-2 pandemic (COVID-19): a morbimortality analysis and recommendations on patient prioritisation and security measures]. Cir Esp (Engl Ed) 2020 Nov;98(09):525–532
11 Iacobucci G. Covid-19: all non-urgent elective surgery is suspended for at least three months in England. BMJ 2020;368: m1106
12 Givi B, Schiff BA, Chinn SB, et al. Safety Recommendations for Evaluation and Surgery of the Head and Neck During the COVID-19 Pandemic. JAMA Otolaryngol Head Neck Surg 2020;146 (06):579–584
13 Kowalski LP, Sanabria A, Ridge JA, et al. COVID-19 pandemic: Effects and evidence-based recommendations for otolaryngology and head and neck surgery practice. Head Neck 2020;42(06): 1259–1267
14 Aminian A, Safari S, Razeghian-Jahromi A, Ghorbani M, Delaney CP. COVID-19 Outbreak and Surgical Practice: Unexpected Fatality in Perioperative Period. Ann Surg 2020;272(01):e27–e29
15 Lei S, Jiang F, Su W, et al. Clinical characteristics and outcomes of patients undergoing surgeries during the incubation period of COVID-19 infection. EClinicalMedicine 2020;21:100331
16 Brar S, Ofo E, Hyde N, et al. Outcomes of elective head and neck confirmed or suspected cancer surgery during the COVID-19 pandemic. Eur Arch Otorhinolaryngol 2020;•••;: Doi: 10.1007/s00405-020-06194-2
17 Riva G, Pizzo C, Fassone E, Pecorari G. Head and neck cancer surgery in COVID-19 pandemic in Northern Italy. Oral Oncol 2020;107:104835
18 Sistiaga Suárez JA, López Álvarez F, Ferrandis Perepérez E, et al. Head and neck cancer in times of COVID-19: Emotion-based medicine. Acta Otorrinolaringol Esp (Engl Ed) 2021;72(01):1–2
19 Day AT, Sher DJ, Lee RC, et al. Head and neck oncology during the COVID-19 pandemic: Reconsidering traditional treatment paradigms in light of new surgical and other multilevel risks. Oral Oncol 2020;105:104684
20 Sowerby LJ, Stephenson K, Dickie A, et al. International registry of otolaryngologist-head and neck surgeons with COVID-19. Int Forum Allergy Rhinol 2020;10(11):1201–1208. Doi: 10.1002/alr.22677
21 EQ-5D. Available in: https://euroqol.org/ [cited 04.10.20]
22 Radulesco T, Lechien JR, Sowerby LJ, et al. Sinus and anterior skull base surgery during the COVID-19 pandemic: systematic review, synthesis and YO-IFOS position. Eur Arch Otorhinolaryngol 2020;•••: Doi: 10.1007/s00405-020-06236-9
23 Mehanna H, Hardman JC, Shenson JA, et al. Recommendations for head and neck surgical oncology practice in a setting of acute severe resource constraint during the COVID-19 pandemic: an international consensus. Lancet Oncol 2020;21(07): e350–e359

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24 Balibrea JM, Badia J, Rubio Pérez I, et al. Manejo quirúrgico de pacientes con infección por COVID-19. Recomendaciones de la Asociación Española de Cirujanos. Cir Esp 2020;98:251–259
25 Chiesa-Estomba CM, Lechien JR, Calvo-Henríquez C, et al. Systematic review of international guidelines for tracheostomy in COVID-19 patients. Oral Oncol 2020;108:104844
26 Morrison DR, Gentile C, McCammon S, Buczek E. Head and neck oncologic surgery in the COVID-19 pandemic: Our experience in a deep south tertiary care center. Head Neck 2020;42(07): 1471–1476. Doi: 10.1002/hed.26262
27 Yu J, Ouyang W, Chua MLK, Xie C. SARS-CoV-2 Transmission in Patients With Cancer at a Tertiary Care Hospital in Wuhan, China. JAMA Oncol 2020;6(07):1108–1110
28 Chen MM, Harris JP, Orosco RK, Sirjani D, Hara W, Divi V. Association of Time between Surgery and Adjuvant Therapy with Survival in Oral Cavity Cancer. Otolaryngol Head Neck Surg 2018;158(06):1051–1056
29 COVIDSurg Collaborative. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study. Lancet 2020;396 (10243):27–38
30 Glasbey JC, Bhangu A, et al; COVIDSurg Collaborative. Elective Cancer Surgery in COVID-19-Free Surgical Pathways During the SARS-CoV-2 Pandemic: An International, Multicenter, Comparative Cohort Study. J Clin Oncol 2020;6:JCO2001933
31 COVIDSurg Collaborative. Delaying surgery for patients with a previous SARS-CoV-2 infection. Br J Surg 2020;25: . Doi: 10.1002/bjs.12050
32 Guidelines NCCN. Head and Neck Cancer. Available in: https://www.nccn.org/ [cited 04.10.20]
33 Radulesco T, Verillaud B, Béquignon E, et al; French Association of Rhinology (AFR) French Society of Otorhinolaryngology, Head and Neck Surgery (SFORL) COVID-19 and rhinology, from the consultation room to the operating theatre. Eur Ann Otorhinolaryngol Head Neck Dis 2020;137(04):309–314
34 Farneti P, Sorace F, Tasca I. Personal protective equipment for ENT activity during COVID-19 pandemic. Eur Arch Otorhinolaryngol 2020;277(10):2933–2935
35 Sayin İ, Devecioğlu İ, Yazıcı ZM. A Closed Chamber ENT Examination Unit for Aerosol-Generating Endoscopic Examinations of COVID-19 Patients. Ear Nose Throat J 2020;99(09):594–596
36 Paleri V, Hardman J, Tikka T, Bradley P, Pracy P, Kerawala C. Rapid implementation of an evidence-based remote triaging system for assessment of suspected referrals and patients with head and neck cancer on follow-up after treatment during the COVID-19 pandemic: Model for international collaboration. Head Neck 2020;42(07):1674–1680
37 Singh HK, Patil V, Chaitanya G, Nair D. Preparedness of the cancer hospitals and changes in oncosurgical practices during COVID-19 pandemic in India: A cross-sectional study. J Surg Oncol 2020;122 (07):1276–1287
38 Guo T, Kiong KL, Yao CMKL, et al. Impact of the COVID-19 pandemic on Otolaryngology trainee education. Head Neck 2020;42(10):2782–2790
39 Mannelli G, Ralli M, Bonali M, et al. Impact of COVID-19 pandemic on Italian Otolaryngology Units: a nationwide study. Acta Otorhinolaryngol Ital 2020;40(05):325–331
40 Eskander A, Merdad M, Irish JC, et al. Volume-outcome associations in head and neck cancer treatment: a systematic review and meta-analysis. Head Neck 2014;36(12):1820–1834

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