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1 **Effects of COVID-19 Pandemic on Otolaryngology Surgery in Italy: The**
2 **Experience of our University Hospital**

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22 Massimo Ralli: Substantial contributions to the conception of the work, revising the work critically,
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24 Antonio Minni: Substantial contributions to the design of the work, revising the work critically, final
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30 Antonio Greco: Substantial contributions to the interpretation of the data, revising the work critically,
31 final approval of the version to be published, agreement to be accountable for all aspects of the work;

32 Marco de Vincentiis: Substantial contributions to the interpretation of the data, revising the work
33 critically, final approval of the version to be published, agreement to be accountable for all aspects
34 of the work

35

36 **Abstract**

37 Otolaryngology and head and neck surgery underwent drastic changes during the COVID-19
38 pandemic. Since March 10, the first day of lockdown in Italy, diagnostic and therapeutic procedures
39 were limited to emergency and oncology patients, while outpatient procedures and clinical exams
40 were temporarily suspended to limit virus diffusion and reallocate personnel in COVID-19 dedicated
41 wards. In our otolaryngology unit, between March 10 and April 28, 2020, we performed 96 surgical
42 procedures; they mainly consisted in diagnosis and treatment of malignant tumors of the head and
43 neck (77%), management of acute upper airway obstruction in both adult and children (14.7%),
44 drainage of abscesses of the head and neck (6.2%), and treatment of nasal bone fractures (2.1%).
45 When comparing this data with that of the same period of 2019 for emergency and oncology
46 procedures, we noticed a drastic reduction of head and neck abscesses and nasal bone fractures, while
47 oncology surgery remained stable.

48

49 **Keywords:** COVID-19, SARS-CoV-2, Otolaryngology, Head and Neck Surgery

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51

52 **Introduction**

53 The Severe Acute Respiratory Syndrome CoronaVirus-2 (SARS-CoV-2), also known as COVID-19,
54 pandemic had dramatic effects on the healthcare systems of most countries worldwide ¹. Italy, the
55 second country for number of COVID-19-related deaths, also underwent profound changes, resulting
56 in a major decrease of non-urgent outpatient diagnostic visits and exams as well as surgical
57 procedures ^{2,3}.

58 As most disciplines, otolaryngology and head and neck surgery activity over the country underwent
59 drastic changes ⁴. Since March 10, 2020, the first day of lockdown in Italy, diagnostic and therapeutic
60 otolaryngology procedures were limited exclusively to emergency and oncology patients, while

61 outpatient procedures and clinical exams were temporarily suspended to limit virus diffusion and
62 reallocate personnel in COVID-19 dedicated wards ⁵.

63 The aim of this work is to report and discuss the changes in the surgical activity of our otolaryngology
64 unit, belonging to the third largest university hospital in Italy, during the pandemic. Particular
65 attention was given to the number of procedures and type of surgery performed during the pandemic,
66 and data was compared to the same period in 2019.

67

68 **Surgical activity in our otolaryngology unit**

69 During the COVID-19 pandemic, according to national regulations, only emergency and oncology
70 patients were treated in our unit. Urgent conditions were represented by respiratory distress, epistaxis,
71 head and neck abscesses, sudden sensorineural hearing loss, and acute vertigo attacks.

72 Surgical procedures performed in our unit during the pandemic principally consisted in
73 tracheostomies, pharyngeal, nasal and laryngeal oncology diagnostic biopsies performed as open
74 surgery, through microlaryngoscopy or endoscopy, and open head and neck oncologic procedures.

75 In all cases, specific COVID-19-related symptoms in the previous two weeks or direct exposure to
76 SARS-CoV-2 were investigated before admission, with special attention to cough, fever and anosmia
77 and dysgeusia ⁶. Also, a nasopharyngeal swab for SARS-CoV-2 was performed before hospitalization
78 and body temperature was measured before entering the operating room. Because of the potential
79 transmission of SARS-CoV-2 through aerosol ⁷ and the contiguity of physician and patient during
80 surgical procedures, personal protective equipment, including FFP2 masks covered by a surgical
81 mask, cap and shoe covers, surgical goggles, gloves and double gowns were used in the operating
82 room by all personnel ⁸.

83 From March 10 to April 28, 2020, we performed 96 surgical procedures. They included 74 (77%)
84 procedures for diagnosis and treatment of malignant tumors of the head and neck, 14 (14.7%) surgical
85 procedures for the management of acute upper airway obstruction in both adult and children
86 (tracheostomies, aspirated foreign body extraction, laryngeal postoperative bleeding), 6 (6.2%)

87 surgical interventions to drain abscesses of the head and neck (retropharyngeal, peritonsillar,
88 parapharyngeal, submandibular, parotid and floor of mouth abscesses), and 2 (2.1%) surgical
89 treatments of nasal bone fractures (Fig. 1). Other emergency conditions encountered in our unit during
90 this period, such as epistaxis, did not require surgery.

91 Figure 2 shows details of the oncologic procedures performed in our unit during the pandemic. Most
92 of them were diagnostic microlaryngoscopy procedures for laryngeal cancer (38 procedures, 51.4%),
93 followed by total laryngectomies (7 procedures, 9.4%), parotid gland tumor surgery (7 procedures,
94 9.4%), endoscopic surgery for nasal and paranasal sinus cancer (6 procedures, 8.1%), oral cancer
95 surgery (5 procedures, 6.8%), neck dissection (4 procedures, 5.3%), subtotal laryngectomies (3
96 procedures, 4.1%), thyroidectomies (2 procedures, 2.7%), rhinopharynx cancer endoscopic biopsies
97 (1 procedure, 1.4%), and external ear canal carcinoma biopsy (1 procedure, 1.4%).

98 Figure 3 shows a comparison of this data with the same period of 2019. From March 10 to April 28,
99 2019, we performed 195 procedures. Most of them were procedures for diagnosis and treatment of
100 malignant tumors of the head and neck (41%), followed by elective surgery (30.3%), upper airway
101 management (12.8%), head and neck abscess drainage (9.7%), and nasal bone fracture surgical
102 treatment (6.2%). Except for elective surgery, which has been suspended, the main changes were
103 found for head and neck abscesses (a decrease of 68.4%) and for nasal bone fractures (a decrease of
104 83.3%).

105

106 **Discussion**

107 During the COVID-19 pandemics, the activity of our otolaryngology unit underwent profound
108 changes still ensuring the diagnostic and therapeutic procedures for emergency and oncology patients.
109 When comparing current data for emergency and oncology procedures to the same period of 2019,
110 we noticed a 50.77% decrease of the overall number of surgical procedures, mainly due to the
111 reduction of beds to avoid contagion (one patient/room), the reduction of available operating rooms
112 and sessions, and the reallocation of nursing and support staff to COVID-19 wards. However, we

113 observed a drastic reduction of head and neck abscesses and nasal bone fractures. In 2019, infectious
114 abscesses represented a frequent cause of surgical urgency in our unit, while their number decreased
115 of nearly 70% during the pandemic. A possible explanation could be the interruption of non-urgent
116 dental activities (endodontic treatment, implantology and dental extractions) for odontogenic
117 abscesses ⁹ and the decreased number of tonsillitis following reduced interpersonal relationships
118 during lockdown for peritonsillar abscesses. The drastic reduction of nasal bone fractures (nearly
119 85%) could be attributable to the cessation of sporting and recreational events and to the reduction of
120 car accidents during the lockdown ¹⁰.

121

122 **Conclusion**

123 The COVID-19 pandemics had a drastic effect on the activity of our otolaryngology unit. Surgical
124 activity was limited to emergency and oncology patients, with a severe impact on other conditions.
125 As the current measures of lockdown continue, it will be difficult to perform scheduled and new
126 exams in a timely manner causing the risk of diagnostic delays with severe impact on patients' health.

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156 **Figure Legends**

157 **Figure 1:** Dot plot showing the main areas of surgical procedures performed in our otolaryngology
158 unit during the COVID-19 pandemic.

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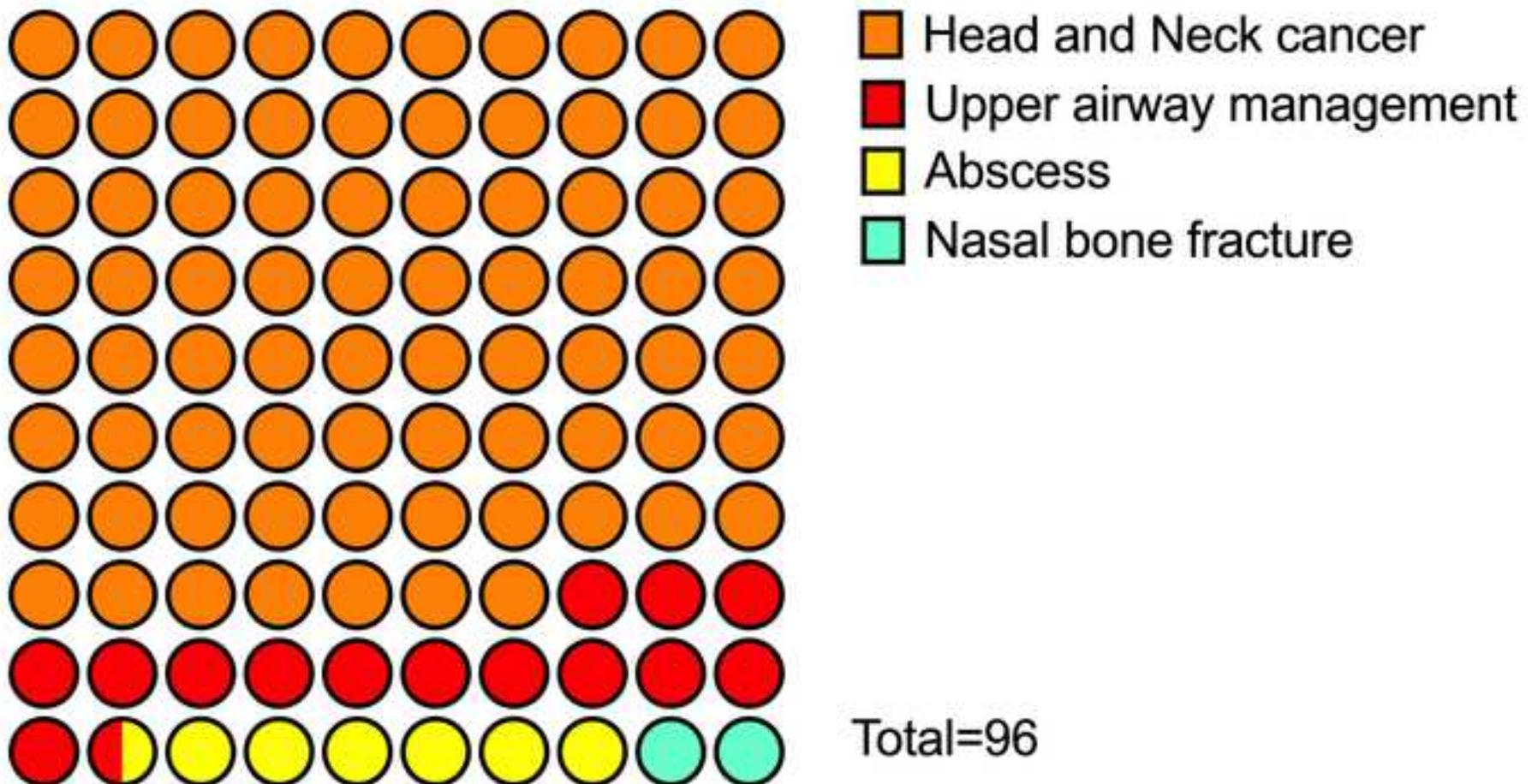
160 **Figure 2:** Oncologic surgical procedures performed in our unit during the pandemic (reference
161 period: March 10 to April 28, 2020)

162

163 **Figure 3:** Comparison between surgical procedures performed in our unit during the pandemic and
164 in during the same period in 2019.

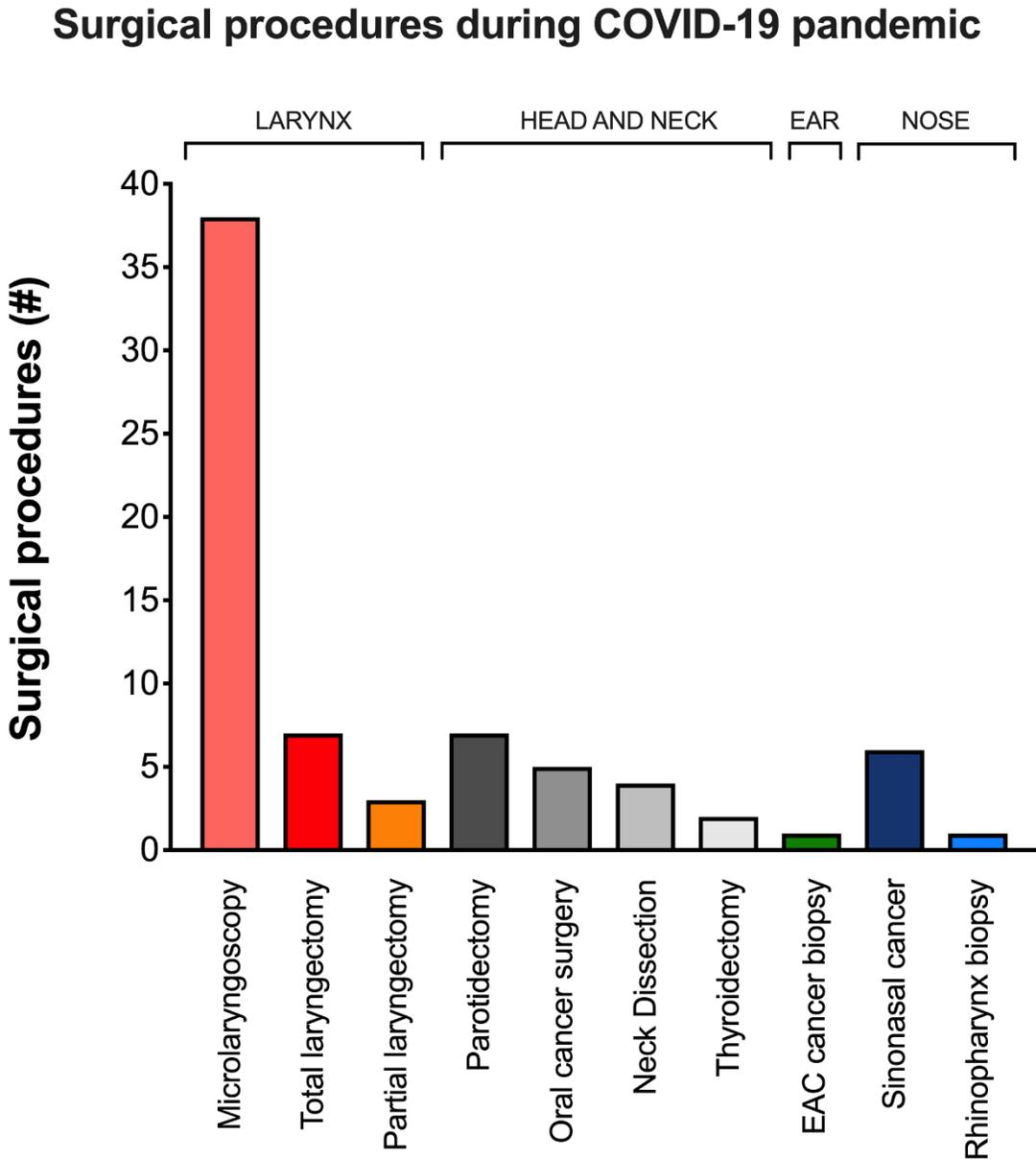
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Areas of surgical procedures during COVID-19 pandemic



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Figure 2.



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Surgical procedures: comparison between 2020 and 2019

