



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research

Vol. 12, Issue, 03, pp. 54852-54855, March, 2022

<https://doi.org/10.37118/ijdr.24145.03.2022>



RESEARCH ARTICLE

OPEN ACCESS

EFFECT OF COVID-19 ON MAXILLOFACIAL SURGERY IN A HOSPITAL IN BRAZIL

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ARTICLE INFO

Article History:

Received 10th January, 2022
Received in revised form
16th January, 2022
Accepted 08th February, 2022
Published online 30th March, 2022

Key Words:

Maxillofacial Fracture, Facial Fracture,
COVID, Epidemiology.

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ABSTRACT

The purpose of this article is to understand the impact of Covid-19 on facial fractures treated at Santa Casa de Ribeirão Preto whose study is longitudinal and retrospective cohort and data were obtained from January 1, 2018 to December 31, 2020, resulting in a predominance of males (66.1%) with a decrease in the rates in all types of trauma and, in accidents, there was a predominance of domestic accidents (10.4%) and traffic accidents (77.4%). There was also an increase in cases of aggression (93.9%) and an increase in cases of abscess of odontogenic origin (100.0%) due to changes in primary-level care protocols to prioritize patients with Covid-19.

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Citation: Rogério Luiz de Araújo Vian, Ana Cláudia Farias Anhalt; Elisa Cândida Braga and Rudiney Jeferson Daruge. "Effect of Covid-19 on maxillofacial surgery in a hospital in Brazil", *International Journal of Development Research*, 12, (03), 54852-54855.

INTRODUCTION

With the first case of the COVID-19 epidemic being reported in 2019 in Hubei Province, China (Wang, 2020) there was a need for a worldwide change in human behavior and in emergency services in health in all areas (Upadhaya, 2020; Steffens, 2020). Health professionals around the world have dedicated themselves to studying and implementing prevention measures in the containment of contagion. The adoption of lockdown management seems to have significantly reflected in the etiology and occurrence of traumas, especially facial traumas, since behavior and exposure to predisposing factors are directly related to the restrictions imposed (Maffia, 2020). The procedures in Oral and Maxillofacial Surgery are considered particularly at risk in transmissions of diseases due to aerosol generated during surgical interventions, patient proximity and the operating environment (Givi, 2020). Therefore, the preparation of personnel and material during the pandemic has to be discussed for the adoption of investments in the system (Blachall, 2020). In the current scenario, it should be clear that proximity to the oral cavity / naso-oral mucosa is potential for aerosolization of secretions containing viral particles during surgical procedures that make most patients undergoing surgical interventions for facial fractures at high risk of COVID-19 transmission (Hsieh, 2020). In general, all elective procedures had to be canceled and rescheduled after safe strategies to limit occupational exposure to be identified (Van der Tas, 2020).

Some services have adopted preventive approaches based on a change of protocols (Bastianpilai, 2020) that began to adopt as an alternative the reduction of closed nasal fractures under local anesthesia. Another example of adaptation to outpatient clinical practices is reported by Hsieh et al (Hsieh, 2020) with the proposal of creating clinics with a controlled outpatient environment minimizing exposure to individuals with unknown status of COVID-19 and avoiding cross-contamination. Also, integrating appointments by telemedicine and triaging patients who need to be seen in person and those who can be postponed. In cases where surgery is required, the preoperative COVID-19 universal test is obtained by the surgery centers (Murphy, 2020). The application of lockdown measures seems to have resulted in a significant decline in some of the main causes of trauma (M.de Boutray, 2019; Jayasuriya, 2020) such as sports and leisure trauma, automobile accidents, in parallel with a decline in surgical procedures for facial trauma. It seems that this phenomenon has not previously reported precedent in the literature. In this study, thirteen French public hospital centers were evaluated and there was a fall in the incidence of facial trauma during the lockdown period. Yeung et al (Yeung, 2020) also had a reduction in the occurrence of care evaluating the lockdown period in London in relation to the same period of the year prior to the pandemic, 2019, both in the trauma service and in the provision of emergency services in the pandemic, in order to learn and plan the services in case of future restrictions on patient care in the lockdown period compared to the year before the pandemic.

The recommendations should continue to change with the progress of the phases of the pandemic (Mckean, 2020) as more information is obtained, the protocol can be further refined and individualized for each institution (Hsieh, 2020). The Italian report (Allevi, 2020) states that there was a great reduction in care in general, being guaranteed care to facial traumas and tumors. In this sense, many alternatives have emerged proposed avoiding face-to-face care. An example of these studies proposing alternatives is that of Murphy et al (Murphy, 2020) that makes a systematic review on the efficiency of the virtual care model, if virtual fracture clinics can provide a means to treat patients remotely, using previously agreed protocols. They play an important role in the current COVID-19 pandemic due to the possibility of providing continued care in a challenging scenario. As the COVID-19 outbreak developed with peaks and consequent isolation measures at different times in different countries and their regions, the need to evaluate the impact of the pandemic on the Brazilian reality was. From this knowledge, it will be possible to plan our own with effective applicability in coping with a future situation with a preparation appropriate to our needs.

MATERIAL AND METHOD

The objective was to verify the influence of COVID-19 in relation to facial traumas and their etiologies. There was an increase or not in the cases, which etiological factor was predominant and especially if there was variation in the number of cases when we compared the prepandemic period with the first year of pandemic SARS COV-2. This study is in accordance with the Helsinki Declaration and recorded CAAE under the no.: 46381321.3.0000.5378.

Statistical analysis: Demographic and clinical data were evaluated using descriptive statistics. Categorical variables were expressed in frequencies and percentages. The frequency-between-year frequency adjustments were analyzed by the chi-square test for the goodness of the adjustment. Statistical significance was defined as $p < 0.05$. The analysis was performed using Software R (version 4.1.1).

RESULTS

From January 1, 2018 to 12/31/2020, 643 patients with a mean age of 36.6 years with male predominance were treated (Table 1). Data were collected from the medical records of patients treated in the period cited by the Bucomaxillofacial Surgery and Traumatology Service of the Hospital Santa Casa de Misericórdia de Ribeirão Preto- State of São Paulo- Brazil and are described in Table 2.

Table 1. Prevalence by age and gender

Year	N (%)	Age	Sex (Male) N (%)
		Mean \pm SD	
2018	283 (44.0)	34.5 \pm 21.8	192 (67.8)
2019	164 (25.5)	37.6 \pm 18.7	115 (70.1)
2020	196 (30.5)	38.8 \pm 19.8	118 (60.2)

Table 2. Type of trauma by year, N (%)

	2018		2019		2020		P-value *
	N	%	N	%	N	%	
ACCIDENT	83	29.3%	70	42.7%	77	39.3%	0.0462
AGRESSION	53	18.7%	20	12.2%	33	16.8%	0.25
PAIN	10	3.5%	2	1.2%	0	0.0%	-
INFECTION	46	16.3%	23	14.0%	26	13.3%	0.68
DISLOCATION	9	3.2%	4	2.4%	1	0.5%	-
FALL	77	27.2%	45	27.4%	47	24.0%	0.75
TUMOR	5	1.8%	0	0.0%	6	3.1%	-
OTHERS	0	0.0%	0	0.0%	6	3.1%	-
Total	283		164		196		

Percentage obtained from the total per year. (*) Chi-square test for goodness of fit. (-) Impossible to test.

In the years prior to the pandemic, the cases seen showed a gradual reduction that worsened in the year of the beginning of the pandemic. It is possible to see in this table that there was a variation over the years surveyed and, if we look at the period 2019-2020, we can see an increase in the cases of accidents (77 patients), aggressions (33 patients), falls (47 patients) and tumors (6 patients) and overall there was a fall in the number of people seen (196 patients) when compared

to 2018 and an increase in cases treated compared to the first year of the pandemic, there was 2019. No an increase, in absolute terms, in cases attended that caused accidents, falls and aggressions even though these numbers are statistically lower than those previously recorded (Table 2). In relation to accidents, there was an increase in domestic accidents and a decrease in traffic accidents, while aggressions showed an increase in cases (Table 3). In 2020, pain sagenerically and, especially mandibular pain, had a drastic reduction in care, not having reported patients treated with this pathology in that year (Table 3). Infections of odontogenic origin showed an increase in cases in 2020 even if it is a slight increase compared to 2019 and a reduction when compared to 2018 and the other infections showed no occurrence (Table 3). Mandibular dislocations showed a decrease in the number of cases treated over the research period (table 3). In 2020, a case of facial asymmetry was attended, a case of nonspecific pain and three cases of Temporomandibular Joint Dysfunction were attended, which when compared to previous years represents an onset of an increase in cases of dysfunction that could be associated with emotional disorders caused by prolonged confinement time (Table 3). In the same table we can observe that the event of fall from own height maintains a small oscillation over time (90.9%-2018; 80%-2019; 85.1%-2020) and may be associated with the greater permanence of people in their homes due to the rules of restriction of movement imposed by the various levels of government and, finally, occurred in 2020 several cases of tumors of dental origin (Table 3). By the types of traumas reported in table 3 we can analyze the types of injuries caused that may be associated with trauma and procedure complications (Table 4).

Table 3. Subtype of trauma second trauma

Type Trauma	Subtype_trauma	2018		2019		2020		P-value *	
		N	%	N	%	N	%		
ACCIDENT	DOMESTIC	2	2.4	0	0.0	8	10.4	-	
	SCHOOL	2	2.4	0	0.0	0	0.0	-	
	SPORTS	13	15.7	2	2.9	5	6.5	0.13	
	WORK	11	13.3	7	10.0	4	5.2	0.45	
	TRAFFIC	55	68.3	61	87.1	80	77.9	0.002	
	Total		83		70		77		
AGRESSION	AGRESSION	53	100.0	20	100.0	31	93.9	0.25	
	KNIFE	0	0.0	0	0.0	1	3.0	-	
	FACE	0	0.0	0	0.0	1	3.0	-	
	Total		53		20		33		
PAIN	PAIN	9	90.0	2	100.0	0	0.0	-	
	JAW	1	10.0	0	0.0	0	0.0	-	
	Total		10		2		0		
INFECTION	DENTAL	33	71.7	21	91.3	26	100.0	0.88	
	GLANDULAR								
	SUBMANDIBULAR	1	2.2	0	0.0	0	0.0	-	
	DENTAL IMPLANT	2	4.3	0	0.0	0	0.0	-	
	INFECTION	1	2.2	0	0.0	0	0.0	-	
	JAW	7	15.2	2	8.7	0	0.0	-	
	OTHERS	1	2.2	0	0.0	0	0.0	-	
	SKIN	1	2.2	0	0.0	0	0.0	-	
	Total		46		23		26		
	DISLOCATION	DISLOCATION	9	100.0	4	100.0	1	100.0	-
Total			9		4		1		
OTHERS	FACIAL ASSYMMETRY	0	0.0	0	0.0	1	16.7	-	
	PAIN	0	0.0	0	0.0	1	16.7	-	
	DTM	0	0.0	0	0.0	3	50.0	-	
	OTHERS	0	0.0	0	0.0	1	16.7	-	
	Total		0		0		6		
FALL	3 METERS	0	0.0	0	0.0	1	2.1	-	
	TREE	1	1.3	1	2.2	1	2.1	-	
	BALANÇO	0	0.0	0	0.0	1	2.1	-	
	ROCKING CHAIR	1	1.3	0	0.0	0	0.0	-	
	STAIR	3	3.9	7	15.6	3	6.4	-	
	OTHERS	1	1.3	0	0.0	0	0.0	-	
	OWN HEIGHT	70	90.9	38	80.0	40	85.1	0.80	
	REDE	1	1.3	0	0.0	0	0.0	-	
	ROOF	0	0.0	1	2.2	1	2.1	-	
	Total		77		45		47		
	TUMOR	MOUTH	2	40.0	0	0.0	0	0.0	-
		DENTAL	0	0.0	0	0.0	5	83.3	-
		JAW	3	80.0	0	0.0	1	16.7	-
Total			5		0		6		

Percentage obtained from the total per year. (*) Chi-square test for goodness of fit. (-) Impossible to test.

All types of injuries reported in Table 4 suffered, to a varied degree, a change in the percentages of care during the period studied.

Table 4. Type of Lesion

Type of Lesion	2018		2019		2020		P-value (*)
	N	%	N	%	N	%	
ABSCESS	27	9.54	13	7.93	15	7.65	0.75
BRUXISM	0	0.00	0	0.00	1	0.51	-
CELLULITIS	7	2.47	4	2.44	10	5.10	0.23
ANEURYSMAL BONE CYST	0	0.00	0	0.00	1	0.51	-
ORAL SINUS COMMUNICATION	2	0.71	0	0.00	0	0.00	-
DTM	5	1.77	0	0.00	0	0.00	-
BLUNT WOUND	31	10.95	8	4.88	11	5.61	0.0364
FRACTURE	134	47.35	93	56.71	108	55.10	0.33
FRACTURE + BLUNT WOUND	6	2.12	0	0.00	2	1.02	-
BRUISE + SWELLING	0	0.00	0	0.00	1	0.51	-
HYPERPLASIA	1	0.35	0	0.00	0	0.00	-
INFECTION	3	1.06	2	1.22	0	0.00	-
DISLOCATION	13	4.59	6	3.66	2	1.02	0.10
DISLOCATION + BLUNT WOUND	2	0.71	0	0.00	0	0.00	-
JAW	3	1.06	1	0.61	0	0.00	-
SOFT TISSUES NECROSIS	0	0.00	1	0.61	0	0.00	-
BONE NECROSIS	2	0.71	0	0.00	0	0.00	-
BONE INFECTION	5	1.77	1	0.61	0	0.00	-
EAR BLEEDING	1	0.35	0	0.00	0	0.00	-
OTHERS	2	0.71	0	0.00	4	2.04	-
BLUNT WOUND	0	0.00	1	0.61	0	0.00	-
TRAUMA	36	12.72	33	20.12	35	17.86	0.14
TUMOR	3	1.06	1	0.61	4	2.04	-
SOFT TISSUE ULCER	0	0.00	0	0.00	1	0.51	-

Percentage obtained from the total per year. (*) Chi-square test for goodness of fit. (-) Impossible to test.

Table 5.1. Type of lesion /Injury site

Type of Lesion	Injury Site	Year			P-value (*)
		2018	2019	2020	
ABSCESS	DENTAL	26	13	15	0.83
	FACE	1	0	0	
CELLULITIS	DENTAL	7	4	10	0.23
ANEURYSMAL BONE CYST	JAW	0	0	1	-
ORO ANTRAL COMMUNICATION	UPPER JAW	2	0	0	-
DTM	JAW	4	0	0	-
BLUNT WOUND	MOUTH	1	0	0	-
	SCALP	1	0	0	-
	FACE	5	3	0	-
	FRONTAL	1	0	1	-
	LOWER LIP	7	0	1	-
	LOWER LIP AND UPPER LIP	0	0	2	-
	UPPER LIP	6	3	3	-
	TONGUE	5	0	2	-
	JAW	3	1	1	-
	NOSE	1	1	0	-
	EAR	1	0	0	-
	EYELID	0	0	1	-
	FRACTURE	ZYGOMATIC ARCH	1	3	12
BLOW OUT		1	0	1	-
DENTAL		2	2	3	-
DENTAL + UPPER LIP		1	0	0	-
DENTOALVEOLAR		4	2	1	-
FRONTAL		0	1	2	-
LE FORT I		2	0	0	-
LE FORT I + JAW		1	1	0	-
LE FORT II		0	0	2	-
LE FORT II + ZYGOMATIC ARCH		0	0	1	-
LE FORT III+ JAW		0	4	0	-
JAW		48	31	22	0.15
JAW + NOSE + UPPER JAW		0	0	1	-
JAW + ZYGOMATIC + ORBIT		0	1	3	-
JAW + ZYGOMATIC ARCH		0	0	1	-
NOSE		58	26	45	0.32
NOSE + DENTAL		0	0	1	-
ORBIT		4	9	3	-
ORBIT + ZYGOMATIC ARCH + BLOW OUT		0	1	0	-
ORBIT + ZYGOMATIC ARCH		9	7	9	0.71
ORBIT + LE FORT I + JAW	1	1	0	-	
ORBIT + JAW	1	3	1	-	
ORBIT + NOSE	0	1	0	-	
ORBIT + DENTOALVEOLAR	1	0	0	-	

Among the types of injuries mentioned above, we can highlight the significant variation in cases of blunt injuries, fractures and traumas, and most of them show a reduction in the sample when compared to the other years studied in the period. Mandibular dislocations, bone infections also had a reduction in cases. The exception is tumors, other unspecified lesions, cellulite that showed increase in reported cases. Table 5.1 describes the types and places of occurrence of lesions involving soft and hard tissue of the face and oral cavity, with abscess and cellulitis being the lesions whose most common origin is dental tissue. The Aneurysmal Bone Cyst had a case diagnosed, in the bucosinusal communications identified in the present study (2) I emphasize that the cases were directly related to implants installed in the maxilla without compliance with the protocol widely known by professionals specialized in the area with conebeam computed tomography for the correct measurement of bone height and width. The blunt-contusion injuries affected different facial regions and the face with a clear reduction in subsequent years and, mainly, in the year 2020.

Table 5.2. Type of lesion/Injury site

Type of Lesion	Injury Site	Year			P-value (*)
		2018	2019	2020	
FRACTURE + BLUNT WOUND	FRONTAL + FACE	1	0	0	-
	LE FORT I + UPPER LIP	1	0	0	-
	JAW + LOWER LIP	0	0	2	-
	NOSE	2	0	0	-
	NOSE + UPPER LIP	2	0	0	-
BRUISE AND SWELLING	FACE	0	0	1	-
INFECTION	DENTAL	0	1	0	-
	TONGUE	1	0	0	-
	JAW	1	1	0	-
	PAROTID GLAND	1	0	0	-
DISLOCATION	DENTAL	3	1	1	-
	DENTOALVEOLAR	1	0	0	-
	JAW	9	5	1	-
DISLOCATION + BLUNT WOUND	UPPER LIP + DENTOALVEOLAR	1	0	0	-
	JAW + DENTOALVEOLAR	1	0	0	-
TUMOR	ANEURYSMAL BONE CYST	0	1	0	-
	JAW	1	0	0	-
	OSTEOMA	1	0	0	-
SOFT TISSUES NECROSIS	MANDIBULA	0	1	0	-
BONE NECROSIS	MANDIBULA	2	0	0	-
BONE INFECTION	JAW	5	1	0	-
BLEEDING	EAR	1	0	0	-
OTHERS	DENTAL	0	0	1	-
	JAW	1	0	1	-
BLUNT WOUND	NOSE	0	1	0	-
TRAUMA	DENTAL	1	2	0	-
	FACE	35	31	34	0.18
TUMOR	CANCER	0	1	2	-
	DENTAL	0	0	1	-
	JAW	3	0	1	-
SOFT TISSUES ULCER	MANDIBULA	0	0	1	-

Facial fractures from the reported traumas caused varying types of fractures with isolated fractures to more complex fractures. In 2020 there was an increase in zygomatic arch fractures, Le Fort II fracture sand sands and multiple fractures (orbit + zygomatic arch + mandible) which was in the opposite direction of the other fractures that presented an important reduction when comparatous the first year of the pandemic with the other years included in the study. In this study, the number of cases treated showed a reduction (2018- N:283; 2019- N: 164; 2020-N: 196) but maintaining a predominance of males (2018- N: 67.8%; 2019- N: 70.1%; 2020-N:60.2%). The expectation was for an even greater reduction in care because with the routine restriction of circulation of the population the understanding was that there would be a reduction in the rates of trauma. This reduction occurred, but not with the expected intensity and, in some types, there was even a relative increase such as aggression and traffic accidents and this conflicts with articles that report a decrease (M. de Boutray,2020; Jayasuriya, 2020; Yeung, 2020). This can be explained by the degree of social distancing measures. The lower the rate of participation, the more likely the occurrence of traffic, work and sports accidents occurs. However, due to the direction of the basic structure of care for the treatment of patients with Symptoms of Sars Cov-2 in 2020, there was an abandonment in the diagnosis of dental and mandibular tumors at the primary level of care and, such cases, they were directed to our service for biopsy (N:6). Dental infections maintained a volume of care with a small negative variation (2018- N:33; 2019- N:21; 2020- N:26) and this can also be credited for changes in care at the primary level (Wang,2020; Upadhyaya, 2020; Steffens, 2020). In this study, we came to the conclusion that the biggest cause of falls are those that originate from their own height, followed by traffic and domestic accidents, even during the lockdown period (M. de Boutray,2020; Yeung, 2020). The fractures showed a reduction and their treatments followed the surgical protocols and prevention the dissemination of SARS COV-2 (Upadhyaya 2020; Givi, 2020; Hsieh, 2020; Hsieh, 2020; Van der Tas,2020; McKean,2020). The pandemic and its restrictions had an impact on facial traumas causing not only its reduction, but also changing its etiology and the associated types of injury, as shown in this article.

It would be interesting to publish new articles establishing a comparison between countries and with greater or lesser urbanization.

Conflict of Interest: There are no conflicts of interest.

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