MANAGEMENT OF TRAUMATIC INJURIES IN THE ORAL AND MAXILLOFACIAL REGION. CONSIDERATION DURING THE COVID PANDEMIC

Adnan Babar, Zahra Saeed, Saad Mahmood, Zunaira Saeed*, Muhammad Ramzan Adeel, Soha Nawaz Kayani

Armed Forces Institute of Dentistry/National Institute of Medical Sciences (NUMS) Rawalpindi Pakistan, *Armed Forces Institute of Pathology/National Institute of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Corona viruses are a diverse group of pathogens that cause diseases of the upper respiratory tract similar to the common cold. Recently the world has been hit by an outbreak of a strain (SARS-CoV-2) of the virus referred to as the novel corona virus which has led to a global pandemic and has spread across 212 countries in the world causing an international health emergency. The novel Corona virus has a droplet spread and patients become symptomatic within 2 to 14 days after exposure to the pathogen. WHO advises maintenance of hand hygiene and social distancing to prevent the spread. Dental clinics and offices are at a great risk of spreading the infection as by generating aerosols from inside the oral cavity that not only pose a risk to the staff of the clinic but also to the patients. While all elective procedures are being deferred, maxillofacial traumatic injuries have to be dealt with on urgent basis because they lead to gross impairment of function and facial disfigurement. Therefore, protocols have been made for the treatment of emergent cases in these times of pandemic by which minimum exposure and spread can be ensured. These protocols include proper use of personal protective equipment, triaging of patients and evaluating the need of urgency for their treatment. When treatment is absolutely necessary, the department should ensure that guidelines as mentioned are followed as to limit the chances of spread of infection pre, per and post operatively.

Keywords: Corona, COVID-19, Dentistry, Maxillofacial surgery.

INTRODUCTION

There are 69,496 cases of COVID-19 reported in Pakistan as recorded at 6:00 AM (PST) on the 31st of May 2020. Ever since Pakistan's first case of coronavirus was reported on 26th February 2020, it has been a constant battle to manage the disease owing to our limited resources. Given the current situation not only the disease has to be managed but its spread also has to be limited. To do that so most of our outpatient departments in hospitals are closed but emergent cases have to be dealt with[1]. The fields of dentistry and maxillofacial surgery are at a great risk during the pandemic due to the generation of aerosols, direct contact and exposure with the oral cavity during procedures so all non-emergent cases are advised to be deferred and all emergencies are to be dealt with precautions[2,3].

A simple sieve to implement this method has been adapted by the University Of Washington for the better interest of their health care staff and patients according to which a surgery should be considered emergent if delaying it for >90 days or 03 months will have a detrimental effect on the outcome and prognosis of the case[4].

Maxillofacial trauma cases in particular have to be treated urgently because they lead to loss of function and significant disfigurement of the skeletal structure[5]. Protocols are devised to manage cases so that the spread can be prevented. A multidisciplinary approach to the management of maxillofacial trauma is advised to limit exposure of the number of personnel[6].

Transfer of Patients Needing Maxillofacial Surgical Intervention.

Telecommunication and teleconsultation should be practiced whenever possible. Any trauma patient requiring review by a maxillofacial surgeon can be discussed using an online portal and radiographs images can be shared while the patient is still in the emergency department of the

Correspondence: Dr Adnan Babar, Classified Specialist, Armed Forces Institute of Dentistry Rawalpindi Pakistan
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hospital. Shifting of the patient can then be done if necessary, to the maxillofacial surgery ward[7].

However, if any maxillofacial surgeon has to come in contact with a patient who requires examination and immediate management in the trauma center he/she should be donned in proper Personal Protective Equipment (PPE) as per guidelines[8]. PPE should include the following.

Gloves, Face mask, Air purifying respirators, Goggles, Face shield, Shoe covers, Head cap, Non-woven gown[8,9].

It should be preferred to treat the patient in the emergency department if possible however any patient requiring surgical intervention has to be shifted to a specialty specific facility for further management.

Table-I: Groups of maxillofacial trauma injuries suggesting the urgency of treatment needed.

Group A: Patients requiring immediate treatment, poor prognosis with delay in treatment.
NOE fractures
Fractures involving base of the skull and leading to complications such as CSF rhinorrhea
Blow out fractures of the orbit
A fracture of the zygomatico maxillary complex which is comminuted
Comminuted mandibular fractures
Nerve injuries particularly trigeminal and facial nerves
Group B: patients in whom if the treatment is delayed, prognosis might be compromised.
Fractures involving floor and walls of orbit with or without diplopia
Displaced fracture of the zygoma or fractures of zygomatic arch
Displaced mandibular, condylar and Lefort I fractures
Fractures of the dentoalveolar segments
Nasal bone fractures that are grossly displaced
Group C: patients in whom treatment can be delayed without an effect on prognosis of the case.
Fracture only involving the anterior table of the frontal sinus
Fracture of only one orbital wall without significant diplopia
A simple mandibular fracture without significant displacement

Prerequisites to Management of A Patient With Maxillofacial Trauma

It is advised to ensure meeting the following criteria before a patient is shifted to the maxillofacial surgery ward and managed. Triaging and screening of patients[10,11]. COVID testing and PCR which is repeated twice over a 48 hour period. Once before shifting and once before surgical intervention Designated room or ward[12].

Receiving A Patient At The Maxillofacial Surgery Department

After having met the aforementioned prerequisites, the patient should be transferred in a designated ambulance with minimum number of staff members. The patient should be taken through an elevator to avoid contamination of all floors and hallways, to a well-ventilated room. The number of attendants and visitors should be kept to a minimum possible. It is preferable if the patients have toilet and shower facilities within their rooms or wards. Proper personal protective equipment and hand hygiene measures should be available to healthcare staff, sanitary workers and all those coming in contact with the patient[13,14].

Making A Diagnosis

The diagnosis making should be such that it minimizes the risk of spread of disease. A thorough clinical examination whilst following precautions should be performed and only necessary radiographs should be requested and taken. It is suggested that the radiology department should be located within the vicinity of the hospital and radiographs that prompt a gag reflex such as the occlusal views should be avoided and substituted with extra oral techniques such as the PA view, PNS view and the OPG[15].

Treatment Planning

Closed treatment for the management of facial fractures should be preferred whenever possible to reduce the risk of exposure at which healthcare personnel are put during aerosol generating procedures. The use of self-drilling MMF screws is recommended[16]. MMF achieves an adequate reduction of the fracture and leads to a good post-surgical occlusion. It however does require a prolonged limitation of function[17]. However, if open reduction is required, care must be taken and strict protocols should be followed.

status of COVID-19 in the patient so that necessary precautions may be taken.

- Polymerase chain reaction (PCR)[18,19],
- HRCT Chest[20].

The PCR is a quick and reliable test for the detection of coronavirus however it may lead to false negatives in some cases. On the other hand CT scan of the chest proves to be more reliable as early changes can be detected if the patient has the disease[21].

Maxillofacial Surgical Procedures

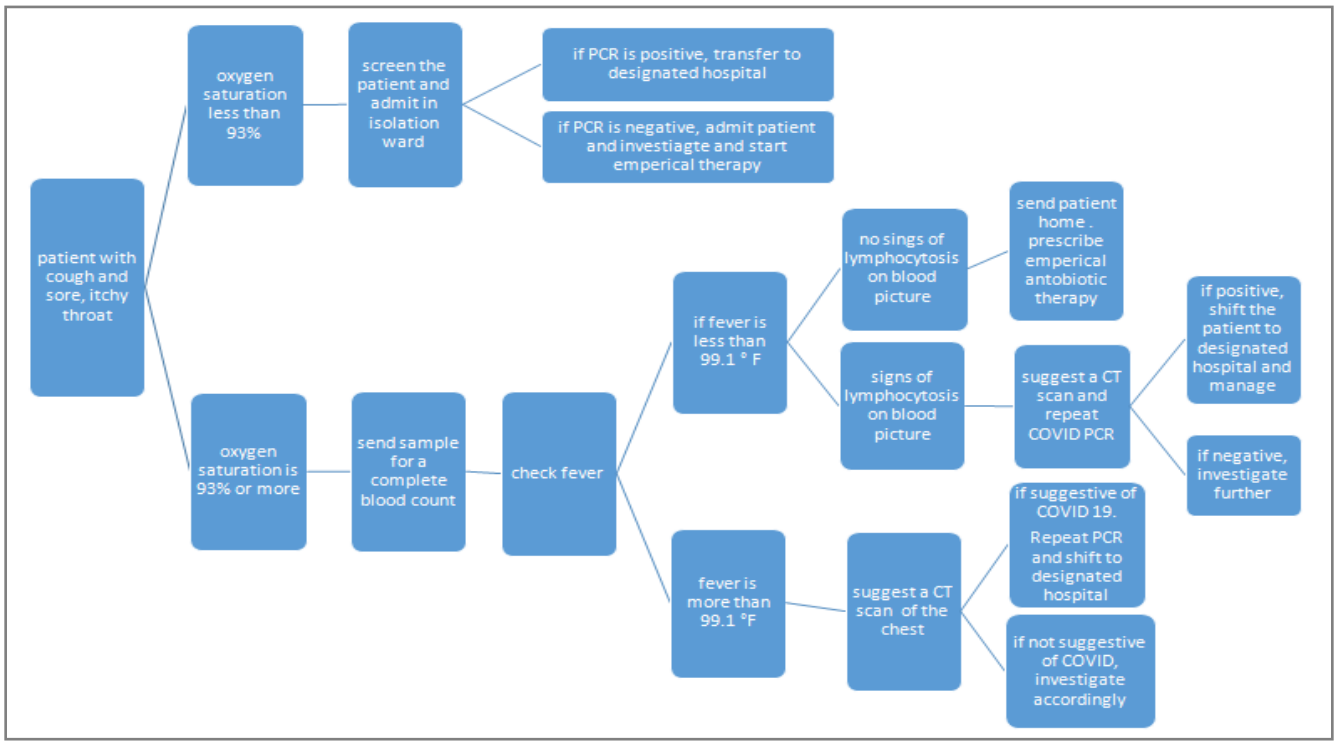

Figure: Triaging of patients for SARS-CoV-2.

To make this decision easier the maxillofacial fractures can be divided into three groups that suggest the urgency and need of treatment.

Preoperative Testing of The Patient Prior to Maxillofacial Surgery

As mentioned before the management of a patient in this pandemic is indeed a multidisciplinary task. Before a patient is declared to be fit for anesthesia, along with other imaging and blood work it is suggested that the following two investigations be carried out to determine the

The surgical team should have proper access to personal protective equipment and should be fully aware with the donning and doffing protocols. Patients should be taken to the operation theater through designated lifts and pathways[22]. Before the procedure is started, there should be an emphasis on limiting the number of members of the operating team and those involved in pre and post-operative care of the patient. It is preferable that the surgery is completed by one single team and exchange of members does not take place during the procedure or surgery[23]. More-

over, the surgical technique with the shortest possible operating time and the least possible intraoral exposure should be selected[24].

Intubation should be done by a well-trained anesthetist using the quickest technique with the greatest chance of success in a single attempt. The patient should preferably be draped in disposable linen drapes and whatever disposable instruments can be used should be utilized[25].

Before the commencement of the procedure an intraoral wash with povidine-iodine solution should be done to reduce the bacterial and viral load of the oral cavity[26]. The use of usual chlorhexidine dis-infectant rinses has been proven insufficient against the corona virus because it is only effective against aerobes, anaerobs and fungi[27,28]. The doors of the operating room should remain closed at all times during the surgery limiting the possible routes of entrance and exit.

A transcutaneous approach after applying a bio occlusive dressing on the oral cavity is preferred over an intraoral approach to minimize exposure from the oral cavity. A scalpel should be preferred to make an incision over an electro cautery device. The use of suction and irrigation devices should be limited. A bipolar cautery device with lowest power settings should be used to achieve hemostasis if required and closure should be done with resorbable sutures so they do not have to be removed from the oral cavity[29].

Table-II: Management of maxillofacial trauma in the COVID-19 pandemic.

Recommendations for management of Maxillofacial Trauma
Prefer a closed procedure over an open reduction and internal fixation of the fracture
Preoperatively have the patient rinse with povidine mouth rinse
For making incisions prefer a scalpel over a monopolar diathermy
If the use of bipolar cautery is required for achieving hemostasis, use it at its lowest setting
Prefer the use of self-drilling screws for fixation of fractures
Minimal amount of irrigation should be used and avoided if it can be
If drilling is to be done, use a slow speed device that is powered by battery
In cases that require osteotomy, use an osteotome instead of a bone cutting saw
Limit the use of suction and irrigation devices
Avoid the use of long term intermaxillary fixation
Management of mandibular fractures
Closed reduction and treatment to be preferred
If at all, open reduction and internal fixation is required, prefer the use of self drilling screws for IMF. Use a bioocclusive dressing over the oral cavity and approach via a transcuatenous approach
Management of maxillary and zygomatic bone fractures
Prefer closed management of fracture
Attempt to use a Carroll Girard screw to reduce the fracture.
For fixation, if stability is achieved by plating the infraorbital rim and the frontozygomatic suture avoid approaching the fracture site intraorally
Management of fractures of the frontal bone
Evaluate the emergency of treatment. Delay if possible
Avoid any endoscopic procedures as they generate aerosols and hence increase the risk of spread of disease
If there is a need consider stripping the mucosa of the frontal sinus manually and avoid the use of powered devices

Adapted from Arbeitsgemeinschaft für Osteosyn these fragen Craniomaxillofacial (AOCMF) guidelines for management of patients during the COVID pandemic.

After the surgery is over the anesthesia circuit should be disinfected with a sterilizing solution that contains approximately 12% H2O2 (hydrogen peroxide) and a disinfectant cong-taining chlorine (2000 mg/L) should be used to disinfect the floor, surfaces and all reusable

instruments. The disinfection process should begin at least after 15 minutes following the departure of the operating team and the patient from the operating theater[30].

Post Operative Evaluation of The Patient

While the patient is in the surgical ward post operatively he/she must be clinically evaluated regularly particularly if symptoms of COVID-19 are noticed or reported since the incubation period of the particular virus is documented to be approximately 14 days and the initial PCR could have been a false negative.

Patient Followup

In these times of pandemic, patient follow up visits should be kept to a minimum. Patient should be contacted on regular basis and follow ups through phone calls and online consultation should be carried out. An appointment should only be planned if the patient has an issue that cannot be addressed by the above mentioned methods.

CONCLUSION

The review of available study material and articles clearly states that maxillofacial surgeons, anesthetists, otolaryngologists and respiratory therapists are at great risk to contract the Novel Corona Virus due to the nature of their work and the excessive exposure to the oral and nasal cavity therefore protocols devised need to be followed for the safety of healthcare workers and to prevent the spread of disease. Triaging should be done and the urgency to treat maxillofacial trauma should be determined. Invasive treatment options should be avoided unless needed.

If the surgery is absolutely required, the patients should be adequately screened and the surgery should be carried out in such a way that will minimize aerosol generation and hence the spread of disease. Follow-ups should be managed by telemedicine and teleconsultation on regular weekly basis.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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