# Maxillofacial Trauma During the COVID-19 Pandemic: The Effects on Facial Injuries and the Implications for the Vulnerable

### Dr Catrin Byrne, Prof. Simon Holmes

## Abstract

### Introduction

Oral and Maxillofacial services were greatly affected during the COVID-19 pandemic, by factors including reduced operating time and the need to limit face-to-face consultations. The situation affected the ways that facial fractures were managed, and there were particular implications for socially vulnerable people.

### Method

Data were collected on patients presenting to The Royal London Hospital with maxillofacial trauma during the pandemic. Medical records were used to assess the mechanisms and severity, as well as the management of injuries. Vulnerable patients were highlighted. Any complications were documented over twelve months.

### Results

104 patients were included, of whom 34 were vulnerable. 65.22% of injuries were non-accidental; this accounted for 38.60% of the injuries to non-vulnerable people, but 82.00% of the injuries to vulnerable people. Vulnerable people were also nearly twice as likely to receive no treatment, where “no treatment” is an absence of an informed clinical decision, as opposed to conservative management.

### Conclusion

During challenging conditions, the OMFS department at The Royal London Hospital made significant efforts to ensure that all their patients were appropriately treated and followed up. Although some were missed, the keeping of an on-call spreadsheet allowed the identification of patients who were not fully reviewed following their injuries. Most significantly, this audit has called to attention the continuing need to address inequity in healthcare. More needs to be done to address individual needs, to facilitate equal access to healthcare for all patients where possible.

## Introduction

In March 2020, during the COVID-19 pandemic, the first UK lockdown was enforced. A mandate for healthcare systems to reduce face to face contact where possible meant that open access walk-in clinics were not feasible. At The Royal London Hospital, the oral and maxillofacial surgery (OMFS) department recognised that the loss of the walk-in trauma clinic would have a large impact on their patient care. Previously, patients were given the walk-in clinic details and it was up to them to attend when they could. However, without this service, patients could only be reviewed by pre-arranged appointment, either in person or by phone. This placed a lot more weight on the clinician-patient communication at the initial consultation, to ensure a mutually acceptable plan was in place for review. It is possible that these changes made accessing care more difficult for certain groups of particularly vulnerable patients, such as victims of domestic violence who might not be able to privately take phone calls at home, or homeless people who have no fixed address and no access to a telephone.

Furthermore, the need to divert UK hospital staff and resources to the many patients with COVID-19 meant that there was significantly reduced capacity for non-emergency operating. Holmes et al produced a paper which offered guidance for OMFS surgeons on determining the best course of management for patients with facial fractures during the pandemic1. The paper suggests a classification of injuries into three groups, based on how likely their injuries are to result in complications if primary reconstruction is delayed. This helps clinicians to allocate valuable operating capacity to patients based on priority, and to identify patients whose injuries can predictably be managed conservatively.

With all these changes in mind, a spreadsheet was set up by the OMFS department with the aim of keeping a record of the patients seen by the on-call team, to ensure that all were appropriately followed-up. The on-call team were asked to document the name, hospital number, date of birth, injury details and outcome of every patient who was referred to them. The records could then be checked at a later date, to ensure that all necessary action had been taken. This spreadsheet, which was used throughout the first lockdown, provides an excellent opportunity to examine the practice of the department during the height of the pandemic. This audit aims to assess how well fracture management guidance was followed, and how robust the system was in ensuring that all patients, including the vulnerable, were followed up appropriately.

## Method

The data used for this audit was collected retrospectively from the OMFS on-call spreadsheet at The Royal London Hospital. Data was collected for a 3-month period between the 22nd of March 2020, which was when the first patient with a fracture was entered into the spreadsheet, and the 23rd of June 2020, which marked the end of the first UK lockdown. Patients were screened based on the referral details that were entered into the spreadsheet. For all entries that indicated a fracture might have been present, or where there was insufficient information to rule out a fracture, the full medical record was assessed. All patients entered into the spreadsheet who were referred and found to have at least one facial fracture were included.

The medical records of the included patients, including relevant imaging, were used to ascertain the mechanism and extent of each injury. Fractures were grouped according to their Holmes classification. Additionally, note was taken of any features which highlighted a patient as vulnerable. Patients who were deemed to be vulnerable included survivors of domestic abuse, individuals involved in gang violence, people with significant mental illness, those in prison, the homeless, and people with ongoing drug and/or alcohol abuse. Any patients where a safeguarding referral had been accepted were also highlighted as vulnerable.

The management of each injury was determined, based on the clinical notes. Management was classified into one of the following groups; Prompt surgical management, Delayed Surgical Management, Prompt IMF (intermaxillary fixation), Delayed IMF, Conservative Management, or No Treatment. For the purposes of the audit, “prompt” was defined as happening within 2 weeks of the initial injury. “Conservative management” was defined as being an informed decision made by a clinician and/or the patient that conservative management was the best course of action based on the patient’s clinical and personal situation, after any planned reviews had taken place. The decision must not have been influenced by difficulties in contacting the patient. This was to ensure that non-treatment in vulnerable people, who are more likely to be difficult to contact, was not overlooked. Any instances where these criteria were not met were designated as “No Treatment”.

All values presented in this report are correct to 2 significant figures.

### Standards

The ideal standard for follow up of referred patients would be that all patients should have been followed up by the department. However, the authors acknowledge that sometimes patients choose not to engage with follow-up. Therefore, this audit looked at whether attempts had been made by the department to contact the patient, if it had been indicated that further contact was required. The standard was set that 0% of patients should go without review due to a failure of the department to reach out to them.

The second standard was that management of fractures should reflect the suggestions of Holmes et al. That is to say that fractures in Group 1 should have been strongly considered for operative management, that fractures in Group 3 should have been managed conservatively, and that the management of fractures in Group 2 should fall somewhere in between. This was assessed globally, rather than by setting a specific numerical target, as patient factors mean that classifications such as these cannot be followed in every clinical scenario.

Finally, a third standard was set that the outcomes of the vulnerable should not be significantly worse than those of the general populations.

## Results

At total of 104 patients met the criteria for inclusion, of whom 34 were deemed to be vulnerable. 23 were seen in the first month, of whom 10 were vulnerable (43.48%). In the second month there were 32 patients, of whom 21 were vulnerable (65.63%). The third month saw 42 patients, of whom 8 were vulnerable (19.05%).

The types of injuries also changed over the 3 months; in the first month, 65.22% of injuries were classed as non-accidental. This figure decreased in months 2 and 3 to 43.75% and 45.24% respectively. The vast majority of accidental injuries happened outside, with only 14.9% of accidental injuries taking place indoors. Over the whole 3-month period, the most common mechanism of injury was accidental injury outdoors, followed by intentional injury by an unknown person. There were 2 patients who were unsure of the mechanism of their injuries (Fig. 1). Vulnerable people presented with more non-accidental injuries, with 28 of the 34 vulnerable patients having non-accidental injuries (82.00%), compared to just 21 of the 70 non-vulnerable people (38.60%).

*Figure 1. The mechanisms of injury of facial fractures seen between 22/03/20 and 23/06/20.*

Of the 104 patients, 21 were classified as having had no treatment. In 13 cases attempts were made by the team to contact the patients, but contact was ultimately unsuccessful. In the remaining 8 cases the lack of definitive management was due to a failure of the OMFS team to follow up on plans to review the patient. This means that sufficient follow-up was not attempted in 7.69% of cases.

In terms of injury severity, 7 patients were identified as having fractures in Group 1; severe fracture patterns with a high likelihood of complication if not promptly operated on. 6 of the 7 Group 1 fractures were in people identified as vulnerable. There were 47 fractures classified as Group 2, and 50 in Group 3.

On the whole, patients’ injuries were managed according to the Holmes classification, with 71.43% of Group 1 fractures being actively treated (Fig. 2), and 88% of Group 3 fractures being managed conservatively (Fig. 4). Group 2 fractures had more mixed results, with 57.45% of cases having some form of active treatment, but 29.79% having no treatment at all (Fig. 3). Of the patients who received no treatment, 19 of them have had no further contact with the department.

*Figure 2. The management of fractures seen between 22/03/20 and 23/06/20, classified as Holmes Group 1.*

*Figure 3. The management of fractures seen between 22/03/20 and 23/06/20, classified as Holmes Group 2.*

*Figure 4. The management of fractures seen between 22/03/20 and 23/06/20, classified as Holmes Group 3.*

Complications were recorded in 10 cases. All of the complications that were documented occurred in patients with Holmes Group 2 fractures. Of those, 5 were treated promptly, 1 had delayed treatment, 1 was managed conservatively, and 3 were not treated.

When comparing the outcomes of the two groups of patients, 29.41% of vulnerable patients received no treatment, compared to 15.71% of non-vulnerable patients. Complications were documented within the year following presentation for 3 of the 34 vulnerable patients (8.82%), and 7 of the 70 non vulnerable patients (10%).

## Analysis

The standard of 0% failure to follow up was almost attained. Attempts were made to follow up 92.31% of patients, and the team succeeded in following up 79.81%. There is certainly improvement to be made, but it is good to see that a significant majority of patients were followed up, especially given that this was, at the time, an entirely novel clinical environment.

Whilst it is regrettable that 8 patients were identified who were not contacted by the department for follow-up, this audit has demonstrated that using a spreadsheet to track patient progress and outcomes is an effective strategy to ensure that the eventual identification of such patients is possible.

The Holmes classification works well as a tool for classifying injuries in a way that makes it easy to prioritise the most severe fractures. Its use in this audit also draws attention to the fact that, whilst decision-making seems clear at the extremes of the spectrum, there might be ambiguity around how to treat injuries in Group 2. It is interesting to note that all the recorded complications occurred within cases of Group 2 injuries. This indicates that perhaps there were cases which would have been better managed with alternative courses of action in the first instance.

It is saddening to see that not only did vulnerable people make up a significant proportion of the patients seen, they were also more likely to present with more serious injuries. Furthermore, they were disproportionately represented in the patients who received no treatment for their injuries, and those who were not contactable for follow-up.

Anecdotally, there were several instances where it was clear from the clinical notes at the time of presentation that a patient was known to be homeless or to not have their own phone, and telephone consultations were still planned, with notes indicating that patients had given a friend or family member’s phone number, or would borrow a phone for the appointment. These patients were often not able to be contacted. This may have been because the clinicians felt that they had been told face-to-face appointments should be limited to those with severe clinical injuries, although they had clearly recognised that a phone appointment would be difficult for the patient in question.

Similarly, there were many instances where patients who were noted to not speak any English were given telephone appointments, which were then very difficult and usually resulted in the patient subsequently being brought in for a face-to-face appointment anyway. There was also one patient given a telephone appointment for review even though he was deaf. Thankfully the clinician had also obtained an email address for the patient, so they were contacted and brought in for a face-to-face appointment. This is another instance where it appears from the notes as though the clinician recognised the patient’s individual needs, yet felt unable to offer them an appropriate review appointment within the constraints of the system.

### Limitations

There were limitations to this audit, which should not be overlooked. The first was that the data were collected from the on-call spreadsheet, and the completeness of the data relied on the junior clinicians documenting every single patient referred to them. It is possible that some referred patients were not documented on the spreadsheet at all, due to human error, so the data cannot be regarded as complete.

Secondly, the definition of “conservative management” used meant that planned reviews had to be followed up on. Therefore, in cases where it was decided that the patient should be reviewed but was not seen again, the outcome was categorised as “No Treatment”, even if a decision for conservative management was later recorded in the notes. Many of these might well have been for conservative management if the patients had been reviewed, but for the purposes of this audit it was important not to overlook them.

It is possible that some cases were resolved, but not documented. For example, decisions may have been made after talking to patients on the telephone or the ward, or after talking to more senior clinicians, but not recorded in the clinical notes. However, it is the obligation of healthcare professionals to keep accurate and contemporaneous records, including all decision making about patient care2. Although patients might be satisfied with a treatment decision being made but not recorded, compared to receiving No Treatment, it is still not an acceptable outcome.

Finally, the figure of 10 recorded complications might be smaller than the actual number, as there were 19 cases where contact between the department and the patient was discontinued before management was concluded. There were also a further 4 cases where review was planned following treatment, but did not take place. It is possible that any number of these patients experienced complications, but have either not sought further treatment or have received care elsewhere.

## Conclusions

During extremely challenging conditions, the OMFS department at The Royal London Hospital made significant efforts to ensure that all their patients were appropriately treated and followed up. Although some were missed, the keeping of an on-call spreadsheet allowed the identification of patients who were not fully reviewed following their injuries. Following this audit, those patients will be contacted to apologise for the delay in reviewing them and to determine whether they have any outstanding issues related to their initial injuries, so that treatment can be offered where appropriate.

The Holmes classification was a useful tool when evaluating treatment decision retrospectively, and called attention to possible confusion surrounding fracture patterns in Group 2. It might be useful in future for clinicians to consider the Holmes classification when determining the management plan for new injuries. Perhaps this would result in further consideration specifically for Group 2 fractures.

Most significantly, this audit has called to attention the continuing need to address inequity in healthcare. Health equity means that everyone should have “a fair opportunity to attain their full health potential”, wherever possible3. That means recognising the different needs of individuals, and using a range of strategies to adapt our care and systems to address those needs, so that all patients may access the same level of care.

In the case of OMFS trauma reviews, there are several strategies that can be employed to improve rates of appropriate follow-up, particularly in the vulnerable. Face to face reviews should be utilised where patients don’t have reliable access to a phone. Furthermore, if patients with no phone are given a specific appointment to attend, they should also be given advice on what to do if they miss the appointment, as they might otherwise be lost due to inability to contact the department. The same should be offered to patients who have been victims of domestic violence, whose attackers might prevent them from using the phone or attending appointments. Similarly, face to face reviews can be utilised in cases where patients have certain communication needs that prohibit effective telephone consultations, such as deafness. For patients who have a phone but don’t speak enough English to be able to participate fully in a telephone consultation, NHS Language Line has a service whereby their interpreters can participate in a 3-way phone conversation along with a clinician and a patient. This is a valuable tool which can be used to allow non-English speaking patients to fully engage in their own healthcare decision making, without the need for a face-to-face appointment.

In the event of another lockdown, all of these considerations will be taken into consideration when planning review and management of patients with maxillofacial fractures. If that situation arises, this audit could be repeated to assess whether improvement has been made. It would also be useful to repeat the audit outside of lockdown circumstances, to assess for any differences.

## References

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