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How has COVID-19 affected surgical practice in Oral and Maxillofacial Surgery in the East Midlands, UK?

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ABSTRACT

The impact on the provision of care within the NHS due to COVID-19 can not be understated. It has created various challenges for Oral and Maxillofacial Surgeons due to the high-risk nature of working within this specialty. The aims of this study were to identify the ongoing clinical activities at the height of pandemic, the guidance issued to staff regarding the use of personal protective equipment and the changes to maxillofacial practice. A prospective analysis was commenced within six Oral and Maxillofacial Surgery units in the East Midlands, UK with data being collected by means of a 10-item questionnaire relating to changes in patient care during this time. The responses were analysed to identify compliance with the national guidance produced by the British Association of Oral and Maxillofacial Surgeons.

An 87% response rate was obtained (26 respondents from 30 invitations). 73.1% of participants confirmed all surgical members of staff were offered fit tests for FFP3 masks. All units reported a continuation of Head and Neck cancer and emergency operations with a complete reduction in TMJ and orthognathic surgery. FFP3 masks were the most popular masks used for theatre activity whilst FFP2 and surgical masks were more widely used for examining patients and performing procedures in the emergency department. Changes in maxillofacial practice included the use of local flaps compared to free flaps, use of inter-maxillary fixation (IMF) where appropriate for craniofacial trauma and routine COVID-19 testing for all inpatients.

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Introduction

The COVID-19 pandemic has far reaching implications for the provision of care in hospitals. Numerous concerns have been expressed regarding patients not receiving their usual care by restricting their visits to hospitals and increasing waiting lists.¹

COVID-19 is the disease caused by severe acute respiratory distress syndrome coronavirus-2 (SARS-CoV-2). The respiratory system is primarily affected, specifically causing lower respiratory tract infections and there is a large variation in the presentation from minimal symptoms to acute respiratory distress syndrome.² Clinicians working within Oral and

Maxillofacial Surgery (OMFS) are at a higher risk of contracting the virus due to the proximity of our treatments to the mouth and nasopharynx.³ In addition to this many of our procedures are aerosol generating (which refers to procedures that produce aerosols of respiratory secretions). The long incubation period of the virus present additional challenges which necessitate the optimisation of our testing protocols and admission criteria. Patients may be asymptomatic during OMFS procedures but may still be capable of spreading the virus.⁴ Due to the high-risk nature of working within this specialty, an audit was conducted focusing on the ongoing clinical activities, changes to our practice and what guidance was issued

Abbreviations: OMFS, Oral and Maxillofacial Surgery; BAOMs, British Association of Oral and Maxillofacial Surgeons; RCS, Royal College of Surgeons; PPE, personal protective equipment.

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to members of staff regarding the use of personal protective equipment (PPE) at the height of the pandemic.

Materials and methods

A prospective audit was designed and the questionnaire (Table 1) used for data collection was developed in accordance with the guidance published by the British Association of Oral and Maxillofacial Surgeons (BAOMS) on the 19th March 2020. The guidance has been implemented indefinitely until the threat from COVID-19 has been overcome. Our standards were taken from the guidance published and are as follows:

- 1) FFP3 mask is essential for all close face to face contact with patients for examination and treatment
- 2) All routine clinics/minor operating should be cancelled
- 3) To ensure continued care of OMFS oncology patients, trauma and emergencies
- 4) Avoid non urgent surgery as much as possible but particularly where aerosols are generated.⁵

The questionnaire was disseminated amongst six different OMFS units in the East Midlands by email. All surgical members of staff were invited to complete the questionnaire and responses were collected anonymously between the 6th April 2020 and the 10th May 2020.

Questionnaire

The questionnaire was comprised of ten questions in total with multiple choice answers and open-ended questions. Our objectives were to evaluate the ongoing clinical activities, departmental use of PPE in different clinical scenarios and the changes to surgical practice.

Results

All OMFS units within the East Midlands responded to our questionnaire. A 87% response rate was obtained (26 complete responses from 30 invitations). At least once response was collected from each of the 6 units. 73.1% of participants confirmed all surgical members of staff were offered fit tests for FFP3 masks, 19.2% reported not all surgical members of staff were offered fit tests for FFP3 masks and 7.7% were unsure. Every unit reported a complete reduction in orthognathic and TMJ surgery with a continuation of Head and Neck cancer and emergency operations (Fig. 1).

The analysis of mask choices revealed FFP3 masks are generally the most popular option amongst clinicians (Table 2). However, 42.3% of responses indicated surgical masks are the preferred choice when examining patients during ward rounds. We report 100% of participants expressed they would

Table 1 – Audit questionnaire (imported into google forms).

- 1) Name of the Trust you are employed by:
- 2) Have all surgical staff members been offered FFP3 fit testing? (Yes/No/Unsure)
- 3) Please detail from the following list (Orthognathic, TMJ, Oncology, Emergency operations, MOS/dento-alveolar procedures) which clinical activities are being carried out at this moment in time?
- 4) For each of the following clinical scenarios, please detail which type of mask (surgical mask/FFP2/FFP3) you would use:
 - a) Ward round examination of a patient
 - b) Patient examination in the emergency department (ED)
 - c) Treatment of acute maxillofacial emergencies e.g. splinting teeth, lacerations
 - d) Performing/assisting with a tracheostomy
 - e) Oncology Theatres
 - f) Emergency Theatres (abscesses, facial trauma)
- 5) Within your Trust, has there been a change of practice with regards to ongoing theatre activity (e.g. increased use of local flaps and IMF)?

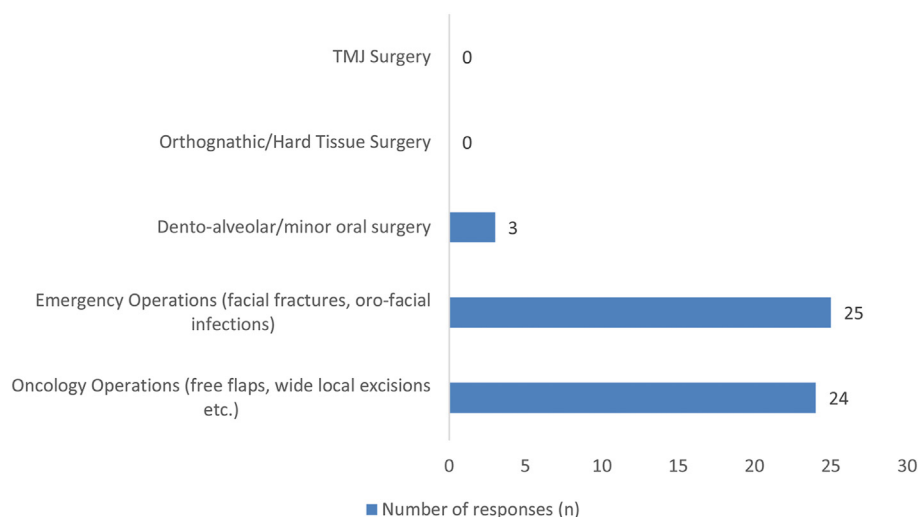


Fig. 1 – Types of operations carried out at the height of the pandemic at different trusts.

Table 2 – Mask choices for different patient-based scenarios.

Procedure	Surgical mask	FFP2	FFP3	N/A
Ward round patient examination	42.3%	19.2%	30.8%	7.7%
Patient examination in the emergency department (ED)	11.5%	34.6%	50%	3.8%
Emergency procedures (lacerations, splinting etc.)	3.8%	19.2%	73.1%	3.8%
Tracheostomies	0%	0%	100%	0%
Oncology operations	3.8%	0%	96.2%	0%
Emergency operations (facial fractures, abscesses etc.)	0%	0%	100%	0%

use FFP3 masks when performing emergency operations and surgical tracheostomies.

Our data reflected several changes to maxillofacial practice with various implications for our patients. Almost every unit in the region reported a reduction in the number of free flaps being performed for reconstructive Head and Neck Surgery. There is a greater utilization of local flaps being utilised for closure of the defect following resection as opposed to free flap reconstruction. Where possible, wide local excisions were also being performed with a view to bring selected patients back in the future reconstruction. Numerous changes were also noted in the management of craniofacial trauma. The increased use of steri-strips and resorbable sutures became apparent from our responses. In addition to this, the use of inter-maxillary fixation (IMF) for facial fractures has generally increased to avoid the production of aerosols during open procedures.

Discussion

COVID-19 presents numerous challenges to oral and maxillofacial surgery, namely minimising exposure to the virus and ensuring the safety of surgical staff whilst maintaining effective care for our inpatients and emergency admissions. In addition to this, all maxillofacial units have been asked to halt any elective surgery as per BAOMS guidance. Our aim was to research if BAOMS guidance was adhered to by auditing the appropriate PPE protocols for different maxillofacial procedures and verifying these were implemented within all the units within the region. By means of a questionnaire we were able to obtain the relevant data pertaining to ongoing activities within each Trust, what guidance was issued to staff regarding PPE and any changes to our practice.

Working within OMFS places us in close proximity to the nose and nasopharynx which have been shown to be reservoirs for high concentrations of SARS-CoV-2-virus.⁶ Additionally, the available literature demonstrates the transmission rate of coronaviruses to health care professionals who are exposed to aerosol generating procedures (AGPs) is significantly increased.⁷ AGPs have been defined as procedures which are more likely to generate higher concentrations of infectious respiratory aerosols relative to coughing, sneezing, and breathing.⁸ Within the context of maxillofacial practice many of the procedures we perform are aerosol generating such as the surgical removal of teeth, reduction and fixation of fractured facial bones and tracheostomies. Consequently, the type of mask worn during patient contact has become extremely important. Three different types of masks are available to us: surgical mask, FFP2 and FFP3. Their

respective efficacies are categorized by their filtering ability.⁹ It is imperative that each individual who is to wear an FFP3 mask must be fit-tested to determine if a proper seal is created and our data reflects the majority of surgical staff were offered fit tests (73.1%). To further minimise this increased risk to staff, across all units in the East Midlands, there has been a complete reduction in elective operations which generate aerosols such as Orthognathic and TMJ surgery.

With regards to essential clinical activities such as the treatment of active malignancies and emergency procedures, the necessary precautions must be taken to reduce the likelihood of transmission. Therefore, within the questionnaire, an emphasis was placed on which masks were ultimately used in these types of scenarios. The results of our questionnaire generally show FFP3 masks to be the most popular choice. This is largely due to BAOMS guidance initially stipulating FFP3 masks are essential for all face to face contact with patients. However, not all units were compliant with this. A significant reason for not meeting this standard was the national shortage of PPE. Therefore, on the 22nd April 2020, BAOMS published an update to its guidance regarding the re-use of FFP3 masks, stipulating one mask may be used for an entire clinical session without removing it.¹⁰ In this update, clinicians were informed surgical masks could be used for aerosol generating exposures (AGEs) such as patient examinations. This is because the amount of viral aerosol generated by speech, coughing or a sneeze is thought to be minimal together with the short duration of patient examination, the protection provided by a visor and surgical mask may be sufficient where there are no additional risk factors. As this update was within our data collection period, our results reflected 42.3% and 11.5% of participants expressed they would wear surgical masks when examining patients during ward rounds and in the emergency department respectively. These percentages were higher than expected but further reinforced the need to be pragmatic with our finite supplies of PPE.¹¹

Within this discussion, we have chosen to highlight the practice of surgical tracheostomies as they are a common procedure within OMFS. They are performed during Head and Neck reconstructive surgery, life threatening airway emergencies and most recently play a part in the management of some COVID-19 positive patients to aid weaning. A surgical tracheostomy is an AGP and exposes clinical staff to airway secretions. It is therefore recommended by BAOMS and Public Health England (PHE) that FFP3 masks must be worn when performing and/or managing tracheostomies. This is widely reflected in the data gathered as 100% of participants expressed if they were asked to perform or assist with a surgical tracheostomy, their choice of mask would be the FFP3.

The final section of our questionnaire focused on the changes to our practice due to COVID-19. There is no doubt that the pandemic has forced us to alter our practice and the overall reduction in the availability of operating theatres has resulted in maxillofacial units categorising procedures based on priority, as seen in the literature.¹²

The provision of care for patients with active malignancies has been one of the greatest concerns arising from the pandemic. Our data reveals one of the most common changes to practice was use of local flaps following cancer resection as opposed to reconstruction with a free flap. This enables a reduction in the number of staff required and allowed more patients to be treated within one theatre session due to the reduced operative time. However, these patients may need to return to hospital in the future to have an elective neck dissection and/or reconstruction with a free flap or more intense clinical or radiological surveillance. They may also be affected disproportionately in terms of mortality from the virus as they often have multiple comorbidities.¹³ Consequently, the effect of the pandemic on this group of patients has led to numerous concerns being raised by NHS England that decreased access by these individuals to healthcare may lead to more deaths due to untreated cancer.²

Another area of maxillofacial surgery which has undergone significant changes to practice is the management of craniofacial trauma. The responses from our questionnaire indicate IMF is being used more often to manage facial fractures in which stability can be achieved using closed reduction alone. This is supported by guidance issued by AO CMF on the 22nd April 2020 which states if internal fixation is not required for stability of the reduction, closed procedures are favoured.¹⁴ This also possesses the additional benefit of avoiding AGPs. In terms of minor craniofacial trauma presenting through the emergency department e.g. lacerations, the use of steri-strips has become more popular. Our responses also indicated the increased use of resorbable as opposed to non-resorbable sutures. The rationale for this change in practice is centered on preventing unnecessary attendance to hospitals and GP practices for suture removal thereby reducing potential exposure to the virus.

Lastly, the changes to our admission protocols as a result of COVID-19 will likely be long-lasting. On the 14th May 2020, the NHS roadmap stated patients who are to be admitted for an elective operation will need to isolate themselves and be asymptomatic before being admitted.¹⁵ In addition to this, any patients requiring emergency admission will also require a negative COVID-19 test prior to attending theatre. At this moment in time, the duration of this guidance is unclear however until the trajectory of the pandemic improves, it is reasonable to expect we will be routinely testing patients for COVID-19 prior to or on admission.

Conclusion

Our audit demonstrated the presence of a unified approach to how we manage our daily activities in light of the COVID-19 pandemic in OMFS in the East Midlands. For healthcare professionals, having access to and using the correct PPE underpins our ability to successfully treat our patients whilst

maintaining our own safety. Provisions have been made in our own hospital for redeployment of junior doctors across wards to establish a stable provision of care for surgical inpatients as per the guidance published by the Royal College of Surgeons.¹⁶ Our data suggests maxillofacial units in the East Midlands are largely compliant with the guidance issued by BAOMS. In a small number of cases where units were not compliant with the PPE recommendations it should be viewed with consideration of the PPE shortages across the country and the updated guidance.

Ethical approval

Not required.

Declaration of competing interest

None.

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