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The impact of the COVID-19 pandemic on orthognathic patients; – what have we learned?

ABSTRACT

Background: Due to the COVID-19 pandemic orthognathic surgery was suspended in the UK. The effect this had on patients, to date, is unknown. **Aim:** A multi-centre, cross-sectional survey was conducted in the UK to investigate the health-related impact for patients on the orthognathic surgery pathway, including those on the waiting list for surgery. **Method:** A structured questionnaire was designed to explore the impact of the pandemic on the patients whose orthognathic treatment was temporarily cancelled. **Results:** Ninety-five questionnaires were returned giving a response rate of 65%. When asked if the delay due to the pandemic had caused emotional distress, 63% (51/81) agreed. Respondents experienced more distress, in relation to dental appearance (60%, 51/83), self-confidence (52% 50/83), facial appearance (53%, 44/83) and ability to eat and chew (59%, 50/83) during the pandemic. One hundred percent of patients would have had appliances fitted or their appliances adjusted during the pandemic and 93% percent of patients stated that they would attend for surgery if they were offered this during the pandemic. In **conclusion**, patients appear to have experienced emotional distress in relation to the delay with their orthognathic treatment. The patients should be given greater priority, during the remobilisation of elective surgery. They should have access to ongoing psychological support, where delays affect their treatment. The “surgery-first” approach may be considered, for suitable patients, to minimise the duration of the treatment journey.

Keywords: Orthognathic; COVID-19; orthodontics; questionnaire; surgical prioritisation; elective surgery.

INTRODUCTION

In response to the COVID-19 pandemic, the National Health Service (NHS) announced a suspension to all elective surgery in March 2020.¹ This included the provision of Orthognathic Surgery, which is carried out for approximately 3,000 patients a year.² In the United Kingdom (UK), the Federation of Specialty Surgical Association's (FSSA) *Clinical Guide to Surgical Prioritisation during the Coronavirus Pandemic* has classed Orthognathic Surgery as priority four (procedures to be performed in more than three months).³ This is unless it is being performed in relation to airway compromise, which does not respond to conservative treatment and the patient is unsuitable for a tracheostomy (priority two).

Patients who were ready for orthognathic surgery were postponed and patients who were undergoing pre-surgical orthodontics were put 'on-hold'. In addition, there was, and still is, a significant number of patients who were waiting for initial joint orthodontic and surgical assessment. Patients who had surgery immediately prior to lockdown were also affected. The psychological, financial, functional, and oral health impact of this delay on these patients is currently unknown.

There have been several studies, since the beginning of the pandemic, which have investigated the impact of delays on patients waiting for different elective procedures, such as cataract surgery, arthroplasty, and bariatric surgery.⁴⁻¹⁰ A national survey of orthodontic patients in active treatment revealed that 49% of patients were very worried about not being followed-up during the pandemic and wanted to see their orthodontist soon. Their main concern related to treatment duration being extended (73%), followed by worries about "things that are not supposed to happen" to their teeth.¹¹

It has been reported that 38% of orthodontic patients reported mental distress from the impact of the COVID-19 pandemic on their treatment.¹² No published studies to date involving patients undergoing combined orthodontics and orthognathic surgery.

The aim of this study was to determine the health-related impact on patients undergoing combined orthodontic and orthognathic treatment during the COVID-19 pandemic.

METHOD

This was a multi-centre, cross sectional study involving orthognathic centres in Scotland and England. In consultation with several multidisciplinary teams, a questionnaire was designed to explore the impact that the suspension of orthognathic treatment has had on patients. At all units patients were seen at a multidisciplinary clinic with the presence of a surgeon and an orthodontist, they were given information leaflet explaining the pathway of the orthognathic treatment.

Approval for the study was granted by the local Clinical Governance Committees at all participating units.

Questionnaires were distributed during the third UK national lockdown, between February 2021 – May 2021. The study was carried out on patients who had been seen on a joint orthognathic clinic and waiting for orthodontic treatment to commence and those who are ready for orthognathic surgery.

Printed anonymised questionnaires were distributed to patients via letter, with a covering letter explaining the rationale for the study. Questionnaires were deemed invalid if gross deficiencies were noted.

To explore the impact of cancellations or delays in treatment, the questionnaire assessed four main domains; emotional distress; worsening of functional deficits; financial loss; eagerness to resume treatment. A five-point Likert scale was used, and the respondents asked to strongly disagree (1), disagree (2), neither agree or disagree (3), agree (4), or strongly agree (5) with a number of different statements.

Shapiro-Wilks was used to test for normality in the questions utilising Likert scales and Cronbach-Alpha was used to test for reliability for the questions using Likert scales.

RESULTS

A total of 146 patients were invited to complete the questionnaire. Ninety-five questionnaires were completed in total giving a response rate of 65%. Two questionnaires were discarded as they had gross deficiencies. Not all respondents completed all questions.

Ninety-seven percent (84/87) of respondents felt that there had been a delay in their treatment. Dental appearance (67%, 62/93) and self-confidence (66%, 61/93) were the main reasons why respondents sought orthognathic treatment, followed by facial appearance (59%, 55/93) and the ability to eat and chew (60%, 56/93). The Cronbach alpha was 0.840 for questions asking if the pandemic had caused emotional distress and 0.832 for questions asking if the reasons for seeking treatment had worsened during the pandemic. This shows excellent reliability as values were > 0.7 .

For all Likert-style questions the Shapiro Wilk test confirmed data were not normally distributed ($p < 0.001$). When asked if the delay due to the pandemic had caused emotional distress, 63% (51/81) agreed (Figure 1). Respondents experienced more distress, in relation to dental appearance (60%, 51/83), self-confidence (52% 50/83), facial appearance (53%, 44/83) and ability to eat and chew (59%, 50/83) during the pandemic.

When asked if anything had worsened during the COVID-19 pandemic, 55% (45/82) agreed that their self-confidence had worsened during the pandemic. In all other factors (dental appearance, facial appearance, ability to eat and chew, ability to breath and speech) less than 50% of patients agreed that they had worsened.

Of the 50 patients in pre-surgical orthodontics, 68% (34/50) had been in fixed appliances for over two years. Of the 23 patients waiting to start pre-surgical orthodontics 58% (14/24) had been waiting between 12 – 18 months to have appliances fitted.

One hundred percent of patients would have appliances fitted or have their appliances adjusted during the pandemic. Ninety three percent of patients would attend for surgery if they were offered this during the pandemic. Forty-six percent of patients (18/39), on the surgical waiting list, had been waiting twelve or more months and 31% of patients on the list

had been given a date that had been cancelled at the beginning of the pandemic. The effect of the delay on their facial appearance and dental appearance were the biggest worries for patients on the surgical waiting list followed by the effect of prolonged orthodontics on appearance and oral health (figure 3). Very few were worried about contracting COVID-19 in hospital and only 6 of the 42 patients on the surgical waiting list were worried about the financial effects of delay on their treatment.

DISCUSSION

To the best of the authors' knowledge, this is the first study to assess the impact of COVID-19 on patients undergoing orthognathic treatment. The aims were to evaluate the impact of the pandemic on this group of patients and assess if the measures put in place to manage them were considered adequate.

Patients overwhelmingly experienced more emotional distress because of the delays in their treatment. They also generally agreed that they experienced more distress with regard to self-confidence, facial appearance, dental appearance, chewing and eating. Many of them were seen on, or at least offered, a video consultation during the pandemic. Our data would suggest that more needs to be done for these patients. Even though most of the patients in this study were routinely screened by a psychologist prior to embarking on orthognathic treatment, there was no provision for psychological support during the pandemic. The offer of video consultation was limited to patients who had had been previously offered a date for surgery, which was then cancelled due to COVID-19. The purpose of these appointments was to inform the patients of the cancellation. It was not designed, nor intended to provide psychological support or stress management. A lesson learned is that it may have been beneficial to have provided a comprehensive, multi-disciplinary video consultation with the presence of the clinical psychologist for all patients affected by the delays resulting from COVID-19

Our results suggest that continued psychological support would have been beneficial, and that this should be the ideal standard of care during a pandemic. This could even be considered for patients who have a significant wait for surgery in non-pandemic times. Prior

to COVID-19, long waiting lists were commonplace within the National Health Service and this study highlights the effects that delays and cancellations, in general, have on patients waiting for orthognathic surgery.

The high level of emotional distress reported by this group of patients provides an argument that they should be given greater priority in the remobilisation of elective surgery. Most orthognathic surgery, under the Federation of Specialty Surgical Association's (FSSA) *Clinical Guide to Surgical Prioritisation during the Coronavirus Pandemic* has been classed as priority four (procedures to be performed in more than three months).³ There are hundreds of different elective surgical procedures and perhaps more detailed sub-prioritisation should be considered for this group, due to the significant psychological impact of dentofacial deformities. Studies have shown that patients who are psychologically distressed before orthognathic surgery have a more complicated post-operative recovery.¹³ A combination of the distress caused by delays and cancellations, as well as the distress commonly seen in the pre-operative phase of treatment should be a cause for real concern.

Cataract surgery (CS) is one of the most common elective procedures in the NHS. A UK survey of patients on a waiting list for CS, carried out between May and June 2020, showed that 64% of patients agreed their eyesight was reducing their quality of life, and 70% were prepared to attend hospital within one month for surgery.⁴ Conversely, 27% of the patients were prepared to wait until cases of COVID-19 had reduced or a vaccine was available. Another cross-sectional study of a CS waiting list showed that over 80% of patients were willing to attend hospital during the pandemic for surgery.⁵ In our study, 93% of orthognathic patients were willing to attend hospital for surgery during the pandemic, and 100% were willing to have their braces fitted and their appliances adjusted. There was a clear desire, therefore, for patients to continue with their treatment throughout the pandemic. Our study does not support the anecdotal misconception that patients with dentofacial deformities are likely to reverse their decision to undergo orthognathic treatment due to the circumstances of the pandemic.

Delays and long waiting lists cause distress and frustration. Combined orthodontic and orthognathic treatment is already a long patient journey, with the British Orthodontic

Society suggesting typical treatment duration to be 24 – 36 months.¹⁴ Where this is further increased by events such as a pandemic, close monitoring and counselling of patients is highly recommended. In addition, consideration should be given to modifying the treatment pathway, where possible, to reduce its duration and minimise its negative impact on patients. There is evidence to suggest that the “surgery-first” approach significantly reduces treatment time, and psychological stress when compared with the “orthodontics-first” approach.¹⁵⁻¹⁷ This may be due to the exaggerating effect of orthodontic decompensation on their facial disharmony and malocclusion. Delays in the treatment pathway, including lengthy surgical waiting lists, even under normal conditions, will only compound the unfavourable psychological effects of pre-surgical orthodontics. It could therefore be argued that the surgery-first approach is beneficial, for suitable patients, in bypassing this phase as well as reducing the wait for surgery and simplifying the treatment journey. In addition, concern with the risks associated with “the effect of prolonged orthodontics on my oral health” was found to be the second greatest concern of patients on the waiting list for orthognathic surgery in our study. But, we acknowledge that the “surgery first” approach may not be suitable for all the cases of malocclusion and skeletal deformities, this should be considered as deemed appropriate.

We acknowledge the limited NHS resources that were available to support patients during the pandemic, but we would like to shed some light on this particular group of patients, who unfortunately were disadvantaged, with no clear pathway to help them cope with the consequences of their dentofacial deformities and the ongoing uncertainty of when the surgical service would resume. Other specialities may have been affected in a similar way and evaluation of the impact of COVID-19 should be considered by them separately as appropriate, but this was beyond the scope of our study. We would like to highlight that the impact of the pandemic on orthognathic patients is likely to be more profound than other group of patients due to the fact that presurgical orthodontic treatment “dental decompensation” tends to increase facial dysmorphology. Perhaps that fact that presurgical ortho exaggerates the undesirable pretx dento-facial features would justify a greater degree of emotional distress because the treatment has made them worse and having to cope with even longer duration of time in that state may lead to heightened concerns compared with other patients who may possibly be physically distress due to chronic condition.

Should all routine orthognathic surgery cases be allocated to “Category 4” in the event of a future pandemic, or should more consideration be given to operating on those whose quality of life is significantly affected by their dentofacial deformity, based on psychological assessment? Obviously, this would partly depend on the transmissibility and severity of the infectious disease and the consequent demands on NHS facilities. A case series looked at 59 patients who had orthognathic surgery between June 2020 and November 2020 in one unit in the UK. No patients were diagnosed with COVID-19 pre-operatively and none had developed COVID-19 30 days postoperatively.¹⁸ At this time there was no approved vaccine in use. Pre-operative-testing, isolation and infection control procedures were the only precautions utilised. The masks used were FFP3 initially, but these were downgraded to fluid-resistant masks in response to changes in government guidelines. Orthognathic patients tend to be younger and physiologically fitter (ASA I and II) compared with groups of patients waiting for other elective surgery. It could therefore be argued that they are a relatively safe cohort to treat during the current COVID-19 pandemic and potentially during a similar future pandemic.¹⁹

In summary, this study highlighted several aspects related to the orthognathic pathway which need to be addressed and shed the light on the following learned lessons; 1. A proactive structured support mechanism should be in place to deal with distress secondary to surgical cancellation. 2. Awareness of NHS authorities should be raised with respect to this group of patients and their level of distress resulting from delays to their treatment. 3. Clinicians and managements should be prepared for future events that may lead to the suspension of this type of elective surgery due to pandemics or health related crisis. Psychology based support programme should be in place and ready to implement and a structured multidisciplinary video consultation should be provided to patients. We recommend full engagement of staff to identify alternative solutions of working to provide orthognathic surgery amidst pandemics rather than reactionary attitude of closing down the service which as an easier solution in the short term. When another pandemic strikes, we ought to be better prepared

The authors appreciate the limitations of this study. Unfortunately, there does not appear to be a universally accepted index that can be used to measure emotional distress in patients waiting for surgery, and the orthognathic quality of life questionnaire may not be sensitive enough for this purpose. We also agree that the sample was heterogenous, as the cancellation, due to the COVID-19 pandemic affected various groups of patients. Some are in orthodontic braces, while others were awaiting a date for surgery, with or without braces. Subdividing the sample into multiple subgroups, based on their stage on the orthognathic pathway would have required a larger sample

The questionnaire response rate was satisfactory and compares favourably with previous studies. It is possible that the patients who responded may have been those experiencing the most distress due to the delays to their treatment and this could skew the data. In addition, there may also be patients who, during the pandemic, decided to no longer pursue orthognathic treatment and thus did not complete the questionnaire. We have no objective evidence to prove or disprove that those patients, were more or less nervous than the respondents. In this study, affirmative statements were used with Likert scales. This could have potentially led patients to agree more readily with the statements presented.

In conclusion, patients report that they have experienced emotional distress in relation to the delay with their orthognathic treatment. The authors suggest that these patients could be given higher priority during the remobilisation of elective surgery. It is also recommended that patients have access to ongoing psychological support during periods of delay in their orthognathic treatment, of whatever cause. The “surgery-first” approach, in suitable patients, provides a method of potentially eliminating the often-unfavourable effects of pre-surgical orthodontics, particularly in class III patients, and may improve the patient’s treatment journey.

CONFLICT OF INTEREST STATEMENT

The authors declare not conflicts of interest.

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Legends of the figures

Figure 1. The delay to my treatment due to cancellations or postponements during the COVID-19 pandemic has cause me emotional distress. 1 – Strongly disagree, 2 – disagree, 3 – Neither agree or disagree, 4 – Agree, 5 – Strongly Agree.

Figure 2. I feel that my self-confidence has worsened or deteriorated during the COVID-19 Pandemic. 1 – Strongly disagree, 2 – disagree, 3 – Neither agree nor disagree, 4 – Agree, 5 – Strongly Agree.

Figure 3. Respondents' biggest worries regarding treatment. Respondents were asked to select all that worried them.

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