The impact of COVID-19 on cleft services in Great Britain & Northern Ireland

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KEYWORDS
Cleft; cleft lip; cleft palate; covid-19; covid; cleft services

Summary Introduction: Cleft lip and/or palate is the most common craniofacial anomaly and occurs in 1 in 650 to 700 live births in the United Kingdom (UK). The majority of cleft surgery is elective, and as a result, almost all cleft surgery was suspended across the UK in March 2020 during the first national lockdown. The UK has centralised regional Cleft Services which all use the same agreed target-age standards for primary surgery including lip and palate repairs. The coronavirus disease-2019 (COVID-19) response has caused a delay in carrying out procedures. The severity of this delay depends on the impact of COVID-19 on local trusts and R-value within that region. As the country goes through the second and third wave, the impact could be long lasting, and we aimed to quantify it so that the data could be used to guide service prioritisation in the NHS and help future workforce planning.

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Methods: An online survey was designed based on the cleft quality dashboard indicators and circulated nationally to all nine cleft regions in the UK. The survey was divided into three main headings:

- Duration of suspended cleft services
- Quantification of the impact on delayed in surgery/services
- Changes needed to restart surgery/services

Results: We obtained a 60% response rate with five completed surveys from five out of nine regions. All regions reported that they suspended their cleft services in March 2020 around the time of the first wave and the first national lockdown. There has been an impact on delayed surgical and clinical interventions for cleft patients. Regions were affected differently with some on an exponential waiting list growth projection, whereas other teams are on track to recover from the backlog within 7-22 weeks. There has been an impact on the allied health professionals’ services within the cleft multidisciplinary team. The cleft nurses’ 24-h reviews, Speech And Language Therapy (SALT), and psychology maintained service delivery in some format. Patient-facing services such as audiology and dentistry were significantly disrupted and continue to experience delays due to reduced capacity.

Conclusions: Various regions have seen a varied impact from COVID-19 on their services, from all cleft regions there seems to be an impact on achieving surgery within the national target age. The adverse effect of the COVID-19 impact is unlikely to be known for a few years to come; however, the data are a useful guide when supporting the allocation of resources within the healthcare setting.

A prospective long-term study is required to assess the impact of COVID-19 on cleft surgery, follow-up, assess access to allied health professional MDT clinics, and long-term complications.

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Introduction

Cleft lip and/or palate is the most common craniofacial anomaly and occurs in 1 in 650 to 700 live births in the United Kingdom (UK). The age at which the repair of the original cleft and subsequent procedures are undertaken can potentially impact the child’s speech, hearing, facial and dental development, and the social and psychological effects on both the child and the family.

Treatment of cleft patients has been centralised into nine regional services with agreed target age standards audited on quarterly basis through The Cleft Registry and Audit NETWORK (CRANE) cleft quality dashboard.

On the week commencing 23 March 2020, the UK announced a national lockdown, to minimise the spread of COVID-19. To maximise access to invasive ventilation if required, the whole NHS suspended all elective surgery. The majority of cleft surgery, other than airway interventions, is elective and was therefore suspended. After the ease of the lockdown measures in July-August, some services resumed predicated on the regional COVID-19 reproduction number (R). This suspension of elective surgery due to COVID-19 has created a staggering delay in carrying out procedures beyond the target age groups, far more than normally expected, the impact of which is currently unknown.

We circulated the survey nationally across the nine different cleft regions to assess the impact of COVID-19 on cleft services, to better estimate the recovery time and the resource required to re-establish the target age standards and access to cleft services.

Methods

An online survey was designed (Appendix 1) based on the Cleft Quality Dashboard’s quality indicators using Smartsurvey.co.uk. The survey was divided into three main headings:

- Suspension of cleft services
- Quantification of the impact on delay in surgery/services
- Restarting services and changes needed to restart surgery/services

The survey link was circulated nationally via the Cleft WhatsApp Group and PLASTA WhatsApp group on 20 August 2020 and a follow-up message on 1 September 2020 and emailed to the regional cleft coordinators.

Participating units were asked to submit their retrospective data from 23 March 2020 till 31 August 2020. Completed and >50% partially completed were included, <50% completed, and incomplete surveys were excluded.

Results

Five complete surveys were returned from 5 Cleft team, from across five different Cleft regions: 60% regional response rate. The completed surveys represented data from Addenbrookes Hospital, Cambridge, Royal Victoria Infirmary, Newcastle, The Spires Cleft Centre, Oxford, Morriston Hospital, Swansea, and The Royal Belfast Hospital for Sick Children, Belfast.

Various regions started suspending their services from 5 March 2021 to 23 March 2021. Four out of the five re-
gions report the suspension of their cleft services before the national lockdown official announcement. The Spire Cleft Centre, Oxford, was the last to suspend their services, on the day of the national lockdown announcement by the UK government.4

Table 2 quantifies the impact of operative delays of key operations beyond the quality indicator age timeframes (CLP3,04), or factors that may impact future quality indicators (CLP7,11,13), the table quantifies the delay in both new patient clinics and follow up clinics. Table 3 shows a higher number of delayed primary cleft lip repairs and a higher number of delayed primary plate repairs compared to the same timeframe in 2019. The long-term impact of these breaches and delays is unknown and will not be apparent for several years.

Table 2 shows the impact of COVID-19 on the allied health professionals and their impact on the associated quality indicators within the cleft multidisciplinary team. Three out of five regions continued with the cleft nurse new baby visits, whereas it was either delayed beyond their standard targets or still suspended (as of 31 August 2020 - Suspended in two out of five regions). The Northern Ireland cleft service reported the suspension was due to lack of replacement during staff maternity leave.

The Speech And Language Therapy (SALT) and clinical psychology services seemed to be the least affected with services running remotely after an initial period of delay beyond their standard targets. Patient-facing services such as dentistry, audiology and clinical photography are significantly impacted with some regions only recently restarting face-to-face (F2F) reviews, at the time of data collection (31 August 2020).

There has been a cumulative impact on the total number of cleft cases waiting for surgery; this is due to the backlog caused by the suspension of services and new patients’ addition to the waiting list. The ability to recover was variable, depending on the availability of operating lists in each region/within each team and the incidence rate of COVID-19 within that region, and the government’s level of restrictions in place to reduce the local COVID-19 incidence rate.

Table 1 shows the total number of pending cases in each region as of 31 August 2020, and the duration needed to clear the surgical backlog caused by the suspension of services due to COVID-19 without the addition of new cases. South Wales region seems to be the most affected, requiring 120 weeks to clear the total number of cases on their waiting lists based on their current number of lists/week and assuming no new patients’. Northern Ireland needs 78 weeks to clear the total number of cases on their waiting list with the same assumptions.

However, when we add the new cases per unit per year; figures extracted for each unit from the CRANE database based on the yearly new cases over the past 10 years (2010–2019). In that case, this will create an added staggering effect on the time needed to recover from the backlog. In South Wales and this produces exponential growth pattern in pending patients. Figure 1 shows the backlog in each region and the estimated time needed to clear the backlog based on four different lists availabilities, 0.25-4 lists per week. A list is equal to a two-session day list (morning and afternoon session) with a total of two patients per list (one patient per session).

Figure 1 shows South Wales has a current upwards projection with their current 0.25 lists/week. The overall trend shows that Northern Ireland has the least sharp decline, whereas the Northern Cleft service is the quickest to recover. All regions need at least 0.5–1 list per week to avoid an increase in their current backlog.

With the addition of new cases, for Wales, and Northern Ireland, they will be likely face an increasing number of backlogged cases especially if the country faces further elective operative restrictions due to a surge in COVID-19.

Table 6 shows that all regions at the time of completing the survey have restarted clinics. Most teams use virtual clinics, and some have restarted F2F clinics. Most cleft regions reported that SALT would likely continue using a permanent mixture between Virtual and Face to Face appointments.

**Discussion**

Several reports show an adverse effect of COVID-19 on adults undergoing surgery under general anaesthesia1–7, but relatively little data on children who need to undergo elective primary surgery. The literature on COVID-19 in children is relatively sparse, and it does appear to be less symptomatic in children than adults. However, there is some evidence of vasculitis-related disease in children, and its long-term complication has been directly linked to COVID-19.8

The majority of cleft surgery, other than airway interventions is elective. As a result, most cleft surgeries were suspended across the UK in March 2020, with regions restarting services depending on the local incidence of COVID-19 and availability of resources including access to PPE, virtual consultation platform, capacity in operating theatres and clinics and staffing.

Data from the five teams from five regions showed that all cleft services were being suspended before the national lockdown official announcement. This likely reflects increased local COVID-19 bed occupancy and reallocation of resources in preparation for worsening incidence at each trust in March 2020. These data are not currently available from the Office of National Statistics.

The reported data suggested an increase in various primary and secondary cases breaching the quality indicator age timeframes.1 In particular, the concern is the delay to primary palate closure. It is generally thought that speech and hearing are improved by early cleft palate repair.9 A delay could result in a higher prevalence of velopharyngeal impairment, a higher fistula rate, and the need for more speech therapy and secondary surgery.10 However, it is a controversial area of cleft care; some European units elect to delay cleft palate repair to reduce midfacial growth retardation.11 However, there is evidence to suggest delay does result in long-term articulation problems, secondary to learned compensatory behaviours in speech.12,13

It is expected that there will be a delay in carrying out procedures, far more significant than would typically be the case, this does depend on the impact of COVID-19 on local trusts and the R-value within each region. The total num-
Table 1  Quantification of delay 23/March/2020 - 31/August/2020 beyond indicator age timeframe.

<table>
<thead>
<tr>
<th>Cleft Service/Team</th>
<th>Quality Dashboard indicators[3]</th>
<th>Addenbrooke’s Hospital</th>
<th>Royal Victoria Infirmary</th>
<th>The Spires Cleft Centre</th>
<th>Morriston Hospital</th>
<th>Royal Belfast Hospital for Sick Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of primary cleft lip repair cases delayed during COVID-19</td>
<td>CLP03</td>
<td>2 (1)</td>
<td>13 (0)</td>
<td>12</td>
<td>9 (0)</td>
<td>3 (0)</td>
</tr>
<tr>
<td>Number of primary cleft palate repair cases delayed during COVID-19</td>
<td>CLP04</td>
<td>12 (5)</td>
<td>2 (0)</td>
<td>17</td>
<td>9 (0)</td>
<td>3 (0)</td>
</tr>
<tr>
<td>Number of speech surgery cases delayed during COVID-19 (pharyngoplasty, intravelar veloplasty, Buccal flap, fistula repair)</td>
<td>CLP07</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>Number of orthognathic procedures delayed during COVID-19</td>
<td>CLP13</td>
<td>9</td>
<td>0</td>
<td>-</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Number of ABG cases delayed during COVID-19</td>
<td>CLP11</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Number of delayed (face-to-face) central cleft clinics during March - August</td>
<td>-</td>
<td>4</td>
<td>52</td>
<td>26</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Number of delayed (face-to-face) spoke cleft clinics (if applicable) during March - August</td>
<td>-</td>
<td>6</td>
<td>22</td>
<td>3</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Total number of current cases pending on the waiting list (All cleft cases)</td>
<td>-</td>
<td>89</td>
<td>100</td>
<td>98</td>
<td>60</td>
<td>39</td>
</tr>
<tr>
<td>10-year average (2010-2019) of new cases per year[3]</td>
<td>74.9</td>
<td>62.2</td>
<td>45.3</td>
<td>39.6</td>
<td>40.9</td>
<td></td>
</tr>
</tbody>
</table>

(x) Number of cases breached within the same period in 2019.

Table 2  Allied health professionals within the cleft multidisciplinary team.

<table>
<thead>
<tr>
<th>Cleft Service/Team</th>
<th>Quality Dashboard indicators[3]</th>
<th>Addenbrooke’s Hospital</th>
<th>Royal Victoria Infirmary</th>
<th>The Spires Cleft Centre</th>
<th>Morriston Hospital</th>
<th>Royal Belfast Hospital For Sick Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft Nurses Review - New Baby Visit</td>
<td>CLP01</td>
<td>No Delay</td>
<td>No Delay</td>
<td>No Delay, Seen Remotely</td>
<td>Delayed Till F2f</td>
<td>Suspended</td>
</tr>
<tr>
<td>Cleft Nurses Review - Other Audiology Review Clinics</td>
<td>CLP02</td>
<td>Suspended Till F2f</td>
<td>No Delay</td>
<td>Suspended</td>
<td>Delayed Till F2f</td>
<td>Suspended</td>
</tr>
<tr>
<td>Speech And Language Therapy Review Clinics</td>
<td>CLP05</td>
<td>Delayed Till F2f</td>
<td>Delayed Till F2f</td>
<td>Suspended</td>
<td>Delayed Till F2f</td>
<td>Suspended</td>
</tr>
<tr>
<td>Dentist Review Clinics</td>
<td>CLP06</td>
<td>Delayed &amp; Remote</td>
<td>Delayed F2f</td>
<td>Suspended</td>
<td>Delayed F2f</td>
<td>Delayed F2f</td>
</tr>
<tr>
<td>Orthodontist Review Clinics</td>
<td>CLP09/11/13</td>
<td>Delayed &amp; Remote</td>
<td>Suspended</td>
<td>Suspended</td>
<td>Delayed F2f</td>
<td>Suspended</td>
</tr>
<tr>
<td>Clinical Psychology</td>
<td>CLP10</td>
<td>Delayed &amp; Remote</td>
<td>No Delay, Seen Remotely</td>
<td>Suspended</td>
<td>Delayed &amp; Remote</td>
<td>Suspended</td>
</tr>
<tr>
<td>Clinical Photography</td>
<td>-</td>
<td>Suspended Till F2f</td>
<td>Suspended</td>
<td>Suspended</td>
<td>Delayed Till F2f</td>
<td>Suspended</td>
</tr>
</tbody>
</table>

F2F: Face to Face. Cleft nurses review (other): Include post-operative review, dressing clinics, etc.
Table 3  Impact on surgical lists.

<table>
<thead>
<tr>
<th>Cleft Service/Team</th>
<th>Addenbrooke’s Hospital</th>
<th>Royal Victoria Infirmary</th>
<th>Spires Cleft Centre</th>
<th>Morriston Hospital</th>
<th>Royal Belfast Hospital for Sick Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of cases pending on the waiting list (All cleft cases)</td>
<td>89</td>
<td>100</td>
<td>98</td>
<td>60</td>
<td>39</td>
</tr>
<tr>
<td>Number of cleft operating lists per week as of August 2020</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>0.25 (1/month)</td>
<td>0.5 (2/month)</td>
</tr>
<tr>
<td>Date cleft operating restarted</td>
<td>08/07/2020</td>
<td>18/06/2020</td>
<td>21/07/2020</td>
<td>01/06/2020</td>
<td>05/05/2020</td>
</tr>
<tr>
<td>Number of lists compared to Pre-COVID-19</td>
<td>Fewer than Pre-COVID-19</td>
<td>More than Pre-COVID 19</td>
<td>Fewer than Pre-COVID-19</td>
<td>Fewer than Pre-COVID-19</td>
<td>Fewer than Pre-COVID-19</td>
</tr>
<tr>
<td>The average number of cases per list as of August 2020</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Number of weeks needed to recover from the backlog - *assuming no new cases were added</td>
<td>22.25</td>
<td>7.692307692</td>
<td>49</td>
<td>120</td>
<td>39</td>
</tr>
<tr>
<td>PPE used in August 2020</td>
<td>FFP3 &amp; Visor</td>
<td>FFP3 &amp; Visor</td>
<td>FFP3 &amp; Visor</td>
<td>Surgical masque type IIR</td>
<td>FFP3 &amp; Surgical masque type IIR</td>
</tr>
</tbody>
</table>

PPE: personal protection equipment.

Figure 1  Projection based on current lists* per region.
*List = morning and afternoon session with a total of 2 patients

The number of cases is likely to increase with new baby referrals in addition to the existing backlog.

Despite services restarting at the time of writing, the total number of cases waiting for surgery could increase. This depends on the regional variation of COVID-19 bed occupancy, staff sickness, capacity and resource allocation during upcoming regional lockdowns. It is also difficult to predict the impact over the coming winter months with the complex interaction of flu and other viral infections mimicking COVID-19 symptoms as well as the introduction of COVID vaccination program.

Different trusts within different regions have had access to a variable number of operating lists per week, depending on trust capacity. The majority of the cleft regions report a reduced number of theatre availability than pre-COVID-19. Wales and Northern Ireland have had access to the least number of operating lists per week, and the current projection shows either a potential growth of their waiting list or needing a more prolonged duration than others to recover. Units will experience an increase in their backlog numbers if areas are further impacted with significant numbers of COVID-19 cases leading to suspension of elective activity.
Cleft surgeons spend a more extended period close to the faces of anaesthetised patients. They are exposed to leaks around the endotracheal tubes for a more significant duration than any other theatre staff member. The majority of cleft teams reported using an FFP3 facemask and a head-visor during cleft cases as personal protection equipment (PPE) to minimise their risk. This interferes with using the microscope and loupes and introduces its problems, particularly during extended operations.

Cleft is managed in a multidisciplinary team with allied health professionals heavily involved in the patient’s cleft journey. Cleft nurse specialists (CNS) will contact the family within 24 h of diagnosis, as it is vital for the parents to learn about the diagnosis and birth procedure. This service was still maintained across most regions after an initial delay. Northern Ireland reported the suspension of their CNS service due to maternity leave and the inability to recruit a replacement during the COVID-19 pandemic.

SALT review clinics play a vital role in speech development and identify the early need for secondary surgery to prevent the development of learned compensatory behaviours in speech. Across most of the regions, they were able to continue their clinics virtually after an initial period of delay. The delay was due to a combination of the time required to set up the software needed for virtual clinics, lack of readily available PPE due to supply chain impact at the start of the pandemic, and changes required to create safe social distancing for staff within the clinic.

The majority of regions reported that going forward, SALT will continue to utilise both a virtual platform and as well as selective F2F appointments if there are concerns. Similarly, most regions reported the ability to restart a significant portion of their new and follow-up clinics using a virtual platform. The most common is NHS Attend Anywhere system. The introduction of a virtual platform has allowed teams to recover from clinic backlogs with a reported higher number of clinics running in most regions compared to pre-COVID time, at the time of completing the survey (Table 4).

**Conclusions**

All regions have seen a varied impact from COVID-19 on their services, some cleft regions significantly more than others. All regions had an impact on achieving primary surgery within the target age. The adverse surgical effect of this impact is unlikely to be known for a few years to come.

The implementation of virtual platforms has been vital in restarting aspects of the cleft services. However, this is not possible for patient-facing services such as audiology and dentistry; the impact of delayed diagnosis and treatment within these MDT services are not formally measured.

A prospective long-term study is required to assess the impact of COVID-19 on patient outcome and long-term complications. These data are currently being collected nationally, by The University of Edinburgh, The Queen’s Medical Research Institute through a National Institute for Health Research Project.

A future re-survey of the impact of COVID-19 on cleft services at the end of the pandemic would be useful to measure the ending result on the impact of delay due to COVID-19. These figures are useful for local cleft services to negotiate with their trust an increase in the number of clinics, and lists needed to recover from any backlog and catch up on delayed cases.

Nationally these data are useful for future workforce planning with potentially aim at increasing the overall number of cleft and palate surgeons and allied health professionals in the UK.

**Conflict of Interest**

None declared.

**Acknowledgements**

Mary Bance Cleft Net East Network Manager
Juan-Jose Blasco Cleft Net East Data Manager
Berry Steven The Spires cleft service Network Manager

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**Table 4  Restarting Cleft MDT Clinics.**

<table>
<thead>
<tr>
<th>Cleft Service/Team</th>
<th>Addenbrooke’s Hospital</th>
<th>Royal Victoria Infirmary</th>
<th>Spires Cleft Centre</th>
<th>Morriston Hospital</th>
<th>Royal Belfast Hospital for Sick Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resumed (face-to-face) central cleft clinic</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Date restarted</td>
<td>18/08/2020</td>
<td>07/07/2020</td>
<td>29/07/2020</td>
<td>01/06/2020</td>
<td>30/07/2020</td>
</tr>
<tr>
<td>Moved to a new format</td>
<td>Virtual</td>
<td>Virtual</td>
<td>Virtual &amp; F2F</td>
<td>Virtual</td>
<td>F2F</td>
</tr>
<tr>
<td>If virtual, what software platform</td>
<td>NHS Attend</td>
<td>NHS Attend</td>
<td>NHS Attend</td>
<td>NHS Attend</td>
<td>Anywhere</td>
</tr>
<tr>
<td>Number of cleft clinics/week</td>
<td>The same as Per COVID-19</td>
<td>More than Per COVID-19</td>
<td>The same as Per COVID-19</td>
<td>More than Per COVID-19</td>
<td>The same as Per COVID-19</td>
</tr>
<tr>
<td>Number of cleft clinics/week</td>
<td>4/week</td>
<td>4.5/week</td>
<td>2/week</td>
<td>4/week</td>
<td>1/week</td>
</tr>
</tbody>
</table>

F2F: Face to Face.
Ethical approval

Not required.

Funding

None.

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