

'Lessons from the pandemic for hand surgery - what have we learned, and what changes will we see going forward.'

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Introduction

The 2019 novel coronavirus (COVID-19) was declared as a pandemic by the World Health Organisation (WHO) on the 11th March 2020 ¹. It led to a global surge in critically ill patients leading to resource reallocation and streamlining of services. The lack of anticipation and preparation meant that changes in clinical practice had to be made in real time and management needed to be altered to offer the best patient care in the safest manner to mitigate the effect of COVID-19.

We are now 2 years and 3 months post-implementation of the initial lockdown in the United Kingdom. Within the realm of hand surgery, one could argue that these years have persuaded hand surgeons to accept debatable radiographs of hand fractures and manage injuries conservatively where operative approaches would have been favoured in the pre-pandemic era. This change in practice for patients presenting with hand-related acute injuries and chronic conditions led to clinicians becoming IT literate, virtually present and potentially deskilled due to COVID lockdown and changing

injury demographics. However, our practice has been resilient through this devastating period by conscious attempts to maintain a safe and excellent level of care, whilst unintentionally adapting to these unprecedented circumstances by the advent of standard operating protocols.

The landscape of hand surgery has been ever evolving in the last decades, adopting an entity of its own. With an increase in number of hand injuries in the pre-pandemic era, hand trauma has been at the forefront of the orthoplastics world. It is crucial that we reflect on our practice and changes adopted during the pandemic, evaluate the benefits and efficiency of the new standard operating protocols in place and implement those into our long-term plan in order to deliver safe and efficient care.

There is a plethora of lessons which we have all learnt from this pandemic, which caught the world unprepared. Although the changes made to cater for these unforeseen circumstances were far from voluntary, boundaries were pushed, and these formed the basis of resulting indirect

service improvements. At the heart of the standstill period of lockdown where time seemed to expand and collapse simultaneously, lie an excellent opportunity for us to identify the factors influencing our decisions, and our values when balancing health against societal and economic impacts.

Epidemiology and pattern of hand injuries

Reduced social interaction resulted in a change in epidemiology of hand injuries during the pandemic. Albeit the reduction in general trauma footfall during the pandemic², the volume of emergency hand presentations have remained unchanged in multiple centres across the UK². The types and mechanisms of injuries reflected the continuation of essential services such as construction and the increase in Do-It-Yourself projects at home. Domestic injuries with tools were the most common ones, followed by machinery and falls from standing height. Social isolation resulted in the dissolution of a support network and an increase in social and financial stressors, which led to an increase in

interpersonal violence and self-harm secondary to mental health conditions ³. Sporting injuries and motor vehicle accidents were reduced during the lockdown period compared to previous years, with almost half the incidence ⁴.

It is interesting to note that the inelastic components of emergency presentations, specifically injuries due to intrinsic patient-related factors such as falls in the elderly population, remained unchanged during lockdown ⁴. With regards to paediatric injuries, school closure and limited interactions led to a reduction of low-impact injuries from fights or sports activities ⁵. Therefore, fewer wrist injuries were seen during the lockdown period. However, a higher proportion of high impact injuries from falls off trampolines and bicycles were noted with an increase in Salter-Harris injury patterns ⁵.

These unique alterations to injury demographics influenced the allocation of resources during the pandemic.

Service reconfiguration: Standard operating practices, decision-making and planning

The need to minimise emergency department waiting times, patient contacts and expedition of management and care resulted in significant changes in our standard operating practices. Elective surgeries were halted and hand trauma services were streamlined to deliver safe and effective care whilst minimising the spread of infection ⁶. Senior decision-making at the time of presentation by consultant and hand fellows was encouraged, and specialist care through a “see-and-treat method” in the emergency department ².

With a reduction in staffing, facilities, and resources available, catering for an unchanged volume of hand trauma required a rapid change in resource allocation. Most hand trauma services were adapted to a “One-stop clinic”, a concept initially coined in 2004 for fast and efficient management of Head & Neck tumours ⁷, whereby patients were assessed, managed and reviewed by hand therapy with immediate splinting in a one-stop session. The combined decision-making approach had a positive impact on patient care and outcomes, and it reduces the number of hospital attendances required, minimising the spread of infection,

and improving compliance as patients were more likely to cancel follow-up appointments due to the fear of contracting COVID-19 ⁸.

Furthermore, time from date of injury to treatment was reduced, with a study showing increased compliance in meeting target wait times for treatment against predetermined standards during the pandemic ⁹.

With regards to surgical practices, cases were mainly consultant-led ¹⁰, with the regulation of surgical team to reduce staff exposure. There was a reduction in the meantime from presentation to surgery as well as the anaesthetic and surgical time which may be accounted for by the senior-led procedures ^{4,9}.

This was further facilitated by the implementation of local anaesthetic pathway and procedures under Wide-Awake Local Anaesthetic No Tourniquet technique (WALANT), obliterating the need for anaesthetic peri-operative care and avoiding the related morbidities ¹⁰. It aids in timely surgical care, minimises hospital encounters, reduces in-stay periods

and contributes to cost efficiencies ¹¹. Patients experience has been satisfactory and pain-free ¹². It had improved post-operative recovery time post-operatively and obviated the need for tourniquet ¹³. Functional recovery was shown to be similar with the use of WALANT compared to regional anaesthesia based on validated patient outcomes scoring systems (quickDASH) ¹⁴.

Further changes in operative practice consisted of the use of absorbable sutures to reduce further appointments for suture removals, and dressings given to patient to change at home, sometimes cast removal instructions.

The updated British Society for Surgery of the Hand (BSSH) ¹⁵ and British Orthopaedics Association (BOA)¹⁶ guidelines favoured a conservative approach to hand trauma during the pandemic. This change in practice aimed to minimise hospital attendance and patient contact, however the long-term impact of conservative management might lead to a higher rate of mal-union or non-union requiring further osteotomy and fixation. Thus metacarpal fractures management during the pandemic were most non-operative and did not seem to

have changed much from the pre-pandemic times, and early patient-reported outcomes showed satisfactory functional results ¹⁷. However phalangeal fractures have less of a consensus and the long-term effect and outcomes of the higher proportion of conservatively managed fractures remain unclear.

NHS innovation and technology initiative – What good looks like framework for digital transformation

Multimedia use increased exponentially during the pandemic, and social isolation acted as a catalyst for digital transformation of the NHS. It formed a vital part of consultation, one of the biggest assets that has been retained since. Consultations and meetings have been brought into the virtual platform which respected the social distancing rules, whilst ensuring patients are receiving optimised care and follow-ups. Encrypted photographic images were transferred to electronic notes acting as a visual aid for virtual follow-ups and monitoring ¹⁰.

To maintain patient safety, education and autonomy became a vital part of virtual consultations. In addition to the primary prevention campaigns by the British Association of Plastics Reconstructive and Aesthetic Surgeons (BAPRAS)¹⁸ and BSSH¹⁵ to avoid unnecessary exposure to injury-prone activities. There was an increased compliance in giving out written advice and guidance as well as the development of rehabilitation and wound care videos and hand surgery and therapy apps. Interestingly, giving patients more autonomy and responsibility in caring for their own wounds and rehabilitation helped increase patient compliance and confidence, with similar outcomes¹⁰. This work entails a cultural shift rather than simply a behavioural one.

Accessibility to digital services should cater for all literacy and inclusion requirements. Having access to healthcare information empowers the individual and allows them to have an active role in their post-operative care and functional recovery¹⁹.

Moreover, there was an increased interest in virtual fracture clinics whereby closed hand injuries seen acutely were referred for senior review and assessment via the trauma virtual pathway. This reduced the waiting time upon acute presentation, avoided duplication, minimised direct patient contact and aimed for a high quality of care with senior decision making ²⁰. Videoconference replaced traditional in person morning meetings, where team members can join even when not on site or on duty. It offers a platform for discussion and planning of each day's activities and to gain the departmental consensus on optimal management plans.

To further facilitate streamlining of care, diagnostic tools such as mini-C-arm were set up in the hand fracture clinic thus allowing fracture manipulation and position check after immobilisation by an IRMER certified practitioner without the patient leaving the clinic ¹⁰. Novel diagnostic modalities such as cone-beam computed tomography (CBCT) scans allow rapid diagnosis of occult radiocarpal fractures with reduced radiation exposure, and may be used as a point-of-care diagnostic tool in the emergency department ²². This is

relevant to suspected scaphoid injuries, whereby immediate diagnosis will streamline care via the scaphoid fracture pathway thus reducing the burden on services with regular follow-ups, unnecessary immobilisation and prolonged waiting time for further imaging such as Magnetic Resonance Imaging (MRI) scans ¹⁰.

Value-based healthcare system, Eco friendliness and cost-effectiveness

We can be certain that the onset of COVID-19 has added unparalleled pressure on an overburdened NHS system. In a pre-pandemic global assessment, the UK was the second country in high alignment with value-based healthcare. Such healthcare relies on outcomes-based and patient-centered care, payment linked to performance and quality and standardisation of practice.

This is reflected in the implementation and magnitude of programmes such as ‘Getting it Right First Time’, where

unwarranted variations are addressed via guideline updates and 'NHS Right Care' based around problem-identification, evidence-based solution, innovation, and improvement. They promote collaborative work, as demonstrated during the pandemic between Ortho-plastics teams and emergency care professionals ²³.

The shape of hand trauma has evolved since the onset of the millennium. There has been a 76% increase in the preceding two decades before the pandemic, which highlighted a need for restructuring of services and the adoption of a 'hub and spoke' model ²⁴. The onset of lockdown has witnessed an unchanged burden of hand trauma, albeit a change in injury demographics. We are now faced with increasing elective case backlogs with 4.43 million patients in February 2020 to 6.48 million in April 2022. The number of patients waiting over a year for treatment has increased by 29 folds ²⁵. The consequent patient deconditioning due to health-burdens as well as the over stretched healthcare system remains a dilemma.

Whilst unintentional, the fortuitous adoption of digital technologies significantly reduced the NHS carbon footprint. Virtual appointments reduced travels, estimated as a reduction of carbon emission equivalent to 40,000 cars in a year, whilst updated data hosting methods and remote monitoring technologies have saved approximately 10,000 tonnes of carbon ²¹. Moreover, the cost-benefit of virtual follow-ups is immense, allowing estimated savings of more than £100,000 per year, whilst the adoption of the WALANT technique can reduce costs by 70% ⁸.

During this post-pandemic era, focussing on value-based healthcare is more important than ever, promoting 'equitable, sustainable and transparent use of the available resources to achieve better outcomes and experiences for every person' ²³.

Conclusion

COVID-19 impacted our already overstretched National Healthcare System (NHS) and hand surgery was not spared. The resulting reduced theatre availability, staff redeployment and cancellation of elective called for a restructuring of hospital resources. This challenge has forced us as a speciality to devise novel techniques, involving minimal patient contact due to the social distancing rules, faster time from diagnosis to management with the implementation of a one-stop shop clinics, senior decision making earlier on and reviewing the selection criteria for surgical management of injuries thus minimising the perioperative burdens on the NHS, avoiding the unwanted risks of surgery for patients and aiming towards a more tailored and holistic care based on individual needs ². There has been an increasing use of technology and multimedia for follow-ups thus optimising resources in terms of time and staff, eco-friendly methods of managing hand-related injuries and conditions such as 3D-printing and thermoplastic splinting at the time of presentation. Public awareness was key for injury preventions, and patient education about self-management of wounds and post-operative care as well as therapy compliant.

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References

1. Injury patterns of patients with upper limb and hand trauma sustained during the COVID-19 pandemic lockdown in the UK: a retrospective cohort study - PubMed [Internet]. [cited 2022 Jun 30]. Available from: <https://pubmed.ncbi.nlm.nih.gov/33713858/>
2. Atia F, Pocnetz S, Selby A, Russell P, Bainbridge C, Johnson N. The effect of the COVID-19 lockdown on hand trauma surgery utilization. *Bone Jt Open*. 2020;1:639–43.
3. Ho E, Riordan E, Nicklin S. Hand injuries during COVID-19: Lessons from lockdown. *J Plast Reconstr Aesthet Surg* [Internet]. 2020 [cited 2021 Feb 7];0. Available from: [https://www.jprasurg.com/article/S1748-6815\(20\)30687-2/abstract](https://www.jprasurg.com/article/S1748-6815(20)30687-2/abstract)
4. The Impact of COVID-19 on Hand Trauma - Serag Saleh, Harrison Faulkner, Kelsi Golledge, David J. Graham,

Richard D. Lawson, Michael J. Symes, Brahman S.

Sivakumar, 2021 [Internet]. [cited 2022 Jun 30]. Available from:

https://journals.sagepub.com/doi/10.1177/15589447211028918?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed)

5. Types, management and complications in paediatric distal radial fractures sustained during COVID-19 lockdown -

Lucy C. Walker, Farouk Hamad, Christopher Wilson, David O'Connor, Simon W Richards, Jeremy J Southgate, 2022 [Internet]. [cited 2022 Jun 30]. Available from:

https://journals.sagepub.com/doi/10.1177/17531934221074307?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed

6. Welman T, Hobday D, El-Ali K, Pahal GS. The COVID-19 Pandemic: The effect on hand trauma in Europe's busiest major trauma centre. *J Plast Reconstr Aesthet Surg* [Internet]. 2020 [cited 2021 Jan 14];0. Available from:

[https://www.jprasurg.com/article/S1748-6815\(20\)30594-5/abstract](https://www.jprasurg.com/article/S1748-6815(20)30594-5/abstract)

7. Witcher TP, Williams MD, Howlett DC. 'One-stop' clinics in the investigation and diagnosis of head and neck lumps. *Br J Oral Maxillofac Surg.* 2007;45:19–22.
8. Sadr MAH, Gardiner MS, Burr MN, Nikkhah MD, Jemec MB. Managing Hand Trauma during the COVID-19 pandemic using a One-Stop Clinic. *J Plast Reconstr Aesthet Surg.* 2020;73:1357.
9. Khor WS, Lazenby DJ, Campbell T, Bedford JD, Winterton RIS, Wong JK, et al. Reorganisation to a local anaesthetic trauma service improves time to treatment during the COVID-19 pandemic – experience from a UK tertiary plastic surgery centre. *J Plast Reconstr Aesthet Surg.* 2021;74:890–930.
10. Picardo NE, Walker H, Vanat Q, Nizar B, Madura T, Jose R. Service reconfiguration in the department of hand surgery during the UK COVID-19 lockdown: Birmingham experience. *Postgrad Med J.* 2021;97:532–8.

11. Hobday D, Welman T, O'Neill N, Pahal GS. A protocol for wide awake local anaesthetic no tourniquet (WALANT) hand surgery in the context of the coronavirus disease 2019 (COVID-19) pandemic. *Surg J R Coll Surg Edinb Irel.* 2020;18:e67–71.
12. Alves RS, Consoni DAP, Fernandes PHO, Sasaki SU, Zaia IM, Santos SBD, et al. BENEFITS OF THE WALANT TECHNIQUE AGAINST THE COVID-19 PANDEMIC. *Acta Ortop Bras.* 2021;29:274–6.
13. Ki Lee S, Gul Kim S, Sik Choy W. A randomized controlled trial of minor hand surgeries comparing wide awake local anesthesia no tourniquet and local anesthesia with tourniquet. *Orthop Traumatol Surg Res OTSR.* 2020;106:1645–51.
14. Ruterana P, Abitbol A, Castel LC, Gregory T. WALANT technique versus locoregional anesthesia in the surgical management of metacarpal and phalangeal fractures: Lessons from the Covid-19 crisis. *Hand Surg Rehabil.* 2022;41:220–5.

15. Coronavirus Information | The British Society for Surgery of the Hand [Internet]. [cited 2021 Jan 14]. Available from:
https://www.bssh.ac.uk/professionals/coronavirus_information.aspx
16. BOA. Coronavirus (COVID-19) update regarding BOA activities and events [Internet]. [cited 2021 Jan 14]. Available from:
<https://www.boa.ac.uk/resources/coronavirus-covid-19-update-regarding-boa-activities-and-events.html>
17. Rojoa DM, Raheman FJ, Irvine E, Sharma V, Macdonald CR, Cutler L. The Impact of COVID-19 on the Choice of Treatment for Hand Fractures: A Single-Centre Concordance Study. *J Hand Surg Asian-Pac* Vol. 2022;27:261–6.
18. COVID-19 Advice for Members | BAPRAS [Internet]. [cited 2021 Feb 7]. Available from:
<https://www.bapras.org.uk/professionals/About/member-resources/covid-19-advice-for-members>

19. What Good Looks Like framework [Internet]. NHS Transformation Directorate. [cited 2022 Jun 30]. Available from: <https://www.nhsx.nhs.uk/digitise-connect-transform/what-good-looks-like/what-good-looks-like-publication/>
20. Anderson GH, Jenkins PJ, McDonald DA, Meer RVD, Morton A, Nugent M, et al. Cost comparison of orthopaedic fracture pathways using discrete event simulation in a Glasgow hospital. *BMJ Open*. 2017;7:e014509.
21. The role of digital technologies in meeting NHS net zero targets [Internet]. NHS Transformation Directorate. [cited 2022 Jun 30]. Available from: <https://www.nhsx.nhs.uk/blogs/the-role-of-digital-technologies-in-meeting-nhs-net-zero-targets/>
22. The use of cone-beam computed tomography (CBCT) in radiocarpal fractures: a diagnostic test accuracy meta-analysis | SpringerLink [Internet]. [cited 2022 Jun 30]. Available from:

<https://link.springer.com/article/10.1007/s00256-021-03883-9>

23. Defining value-based healthcare in the NHS — Centre for Evidence-Based Medicine (CEBM), University of Oxford [Internet]. [cited 2022 Jun 30]. Available from: <https://www.cebm.ox.ac.uk/resources/reports/defining-value-based-healthcare-in-the-nhs>
24. ORA - Oxford University Research Archive [Internet]. [cited 2022 Jun 30]. Available from: <https://ora.ox.ac.uk/objects/uuid:475d5468-6368-410c-b2ed->
25. NHS backlog data analysis [Internet]. [cited 2022 Jun 30]. Available from: <https://www.bma.org.uk/advice-and-support/nhs-delivery-and-workforce/pressures/nhs-backlog-data-analysis>