AB103. SOH23ABS_208. The use of 3D-printing in the management of 'Terrible Triad' of the elbow

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Background: A 48-year-old male presented with an elbow injury consistent with 'Terrible Triad' of the elbow following an 8-foot fall from a roof. The orthopaedic team felt no 'off-the-shelf' solutions were suitable to treat this postoperatively. A new solution was required in order to keep the wrist pronated while allowing for controlled movement of the elbow, and adjustment during the healing process.
Methods: A 3-dimensional (3D) Scanning kit was used to scan the patient's arm. The scanning process uses high resolution non-contact mapping to sculpt an exact fit for the individual patient. The main body of the splint was printed on a digital light processing (DLP) printer, however different parts were printed using various other 3D printing technologies such as fused deposition modelling (FDM) and stereolithography (SLA).
Results: The patient underwent open reduction and internal fixation and was subsequently fitted with this model which fit perfectly, was adjustable, and did not need require revision. He has attended two follow-up clinics to assess the progress so far and satisfactory results were seen on X-rays.
Conclusions: The model created in this case can act as a template for a variety of future splints and long-term fixations as this allows for adjustment during the healing process. This is an important case as it shows potential for altering management strategies of complex elbow injuries in the future. This case also shows that custom printing can lead to a lot more comfort for patients for many weeks and still provide a high standard result.
Keywords: 3-dimensional (3D); elbow; printing; splint; terrible triad

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Footnote

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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