



Developmental Dysplasia Of The Hip

Use of Axial3D model to aid in the preoperative planning of complex paediatric developmental dysplasia of the hip case.

Abstract

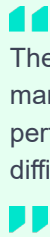
A physical 3D printed model was used help plan reconstruction of the acetabulum using a section of the patient's iliac crest. The model provided a much greater impression of the femoral head & acetabular surface.

Clinician

Mr. James Ballard, Consultant Orthopedic Surgeon

Healthcare Provider

Royal Belfast Hospital for Sick Children, Northern Ireland



The impression of femoral head and acetabular articulation was enhanced greatly by the manufacturer of the 3D print which helped in terms of surgical planning. We were able to perform our osteotomy in the correct position giving us maximum coverage in what was quite a difficult surgical decision and the model helped us a great deal in getting the optimal correction.

**Mr. James Ballard, Consultant Orthopedic Surgeon,
Royal Belfast Hospital for Sick Children, Northern Ireland**

Case

A six year old patient presented with a late presentation of a right dysplastic left hip. Investigations showed the hip was not dislocated but contained within a very high volume socket. At the time he had undergone multiple surgeries for containment but still had a high volume acetabulum. Given the complexity of the pathology and surrounding anatomy additional information was required.

Solution

The surgeon was provided with a 1:1 scale physical 3D model of the patient's pelvis along with their proximal femur to show the exact size and shape of the eroded socket as well the articulating surface on the femoral head.



FIG 1
Anterior medical aspect of ilium ischium and pubis in situ.

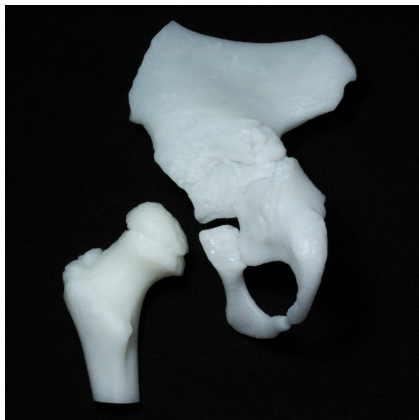


FIG 2
Full pelvis model with proximal femur.



FIG 3
Posterior aspect of proximal femur showing worn femoral head.

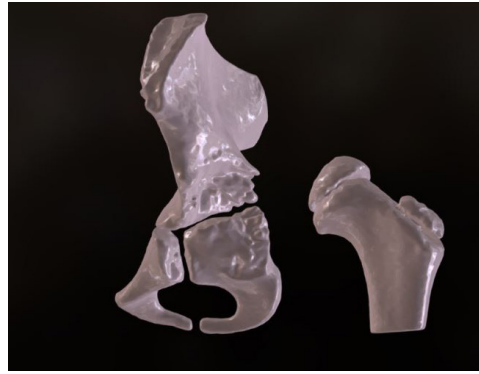
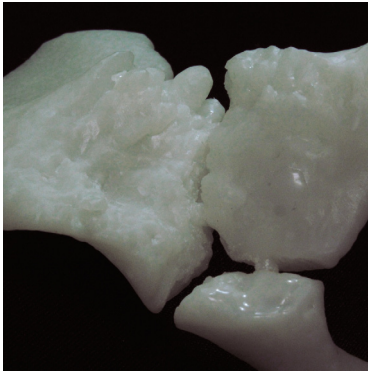


FIG 4 (Left)

Close up of acetabulum showing extend of damage to articulating surface.

FIG 5 (Right)

3D interactive visualization used to explain procedure to patient and parents.

Result

The physical 3D model offered a much better understanding of the articulating surfaces within the patient and allowed for a more accurate diagnosis of the patients pathology. With the physical 3D model it was discovered that there was damage to not only the acetabulum but also the femoral head through frictional wear.

Conclusion

Using the physical 3D printed model to assess the patients anatomy outside of the body and on 1:1 scale, the surgeon could properly assess the patient's pathology. Allowing for artificial articulation of the joint to fully assess the extent of the damage. This led to a much greater understanding of the pathology and eventual preoperative insight not available with conventional imaging.

Benefits



Patient

Elevating Patient Care

- ◆ Faster treatment
- ◆ Reduced time in theatre
- ◆ Improved communication
- ◆ Reduced complications



Clinicians

Advancing Surgical Standards

- ◆ More accurate diagnosis and preoperative planning
- ◆ Identified additional pathology not found with conventional images
- ◆ Useful surgical guide



Healthcare Provider

Improving Standards and Efficiencies

- ◆ Increased standards of care
- ◆ Reduced risk of complications and infections
- ◆ Saved time and money in surgery and post-operative care

Model Specifications

Patient Data:	301 CCT images			
Color:	White <input checked="" type="checkbox"/>	Grey <input type="checkbox"/>	Clear <input type="checkbox"/>	Clear with Contrast <input type="checkbox"/>
Layout:	In-situ <input checked="" type="checkbox"/>	Separate <input checked="" type="checkbox"/>		
Construction:	Solid <input checked="" type="checkbox"/>	Hollow <input type="checkbox"/>	Split <input type="checkbox"/>	
Process and Delivery:	48 hours			

Contact Us

contact@Axial3D.com
+4428 9018 3590

Further information

www.Axial3D.com
[@Axial_3D](https://twitter.com/Axial_3D)

Sign up to start using our secure online order service today:

orders.Axial3D.com