

Don't Worry, We Can Print It

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INTRODUCTION:

Reconstructive surgery in orthopaedic oncology using 3D-printed implants is steadily gaining popularity in the past few years. It provides an alternative when conventional modular implants do not fit patient's anatomy.

REPORT:

We report two cases of our early experience in using 3D-printed implants in Penang. Meticulous planning using computed tomography (CT) scan and magnetic resonance imaging (MRI) was done to engineer the implants.

Patient A is a 60-year-old lady with history of right total elbow replacement complicated with aseptic loosening requiring multiple revision. A revision with allograft reconstruction was performed however the allograft fractured after 18 months. Subsequent revision surgery was done with use of a 3D-printed proximal humeral component due to the short segment of proximal humerus left post resection. This enabled salvage of the native glenohumeral joint preventing the need of a total humeral endoprosthesis.

Patient B is an 11-year-old boy with massive non-metastatic left upper tibia osteosarcoma involving the knee joint. Reconstructive surgery was done with the aid of the customized 3D-printed for the short distal tibia stem and distal femur component. The aim of preserving the distal femur growth plate and ankle joint was achieved.

Post-surgery, patient A was able to achieve shoulder abduction of 0-60 degrees while patient B was able to weight bear immediately and had satisfactory knee range of motion of 0-90 degrees and subsequent follow ups noted radiographical evidence of equal growth of the femur.

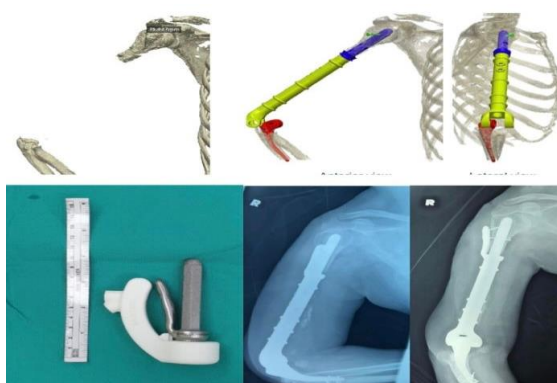


Fig.1 patient A.(clockwise) pre-operative CT 3D reconstruction image, 3D-printed proximal humeral stem, plain radiograph of right humerus post-operative.



Fig.2 patient B.(clockwise) pre-operative CT 3D reconstruction image, 3D printed distal femur component, plain radiograph of left tibia and femur post-operative.

CONCLUSION:

3D-printed implants have made reconstructive surgery possible in patients where conventional modular implants are incompatible.

REFERENCES:

1. Park, Jong Woong, and Hyun Guy Kang. "Application of 3-dimensional printing implants for bone tumors." *Clinical and experimental pediatrics* vol. 65,10 (2022): 476-482.