A 3D Printed Breakthrough for Complex Children's Fractures

September 2, 2014

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LEUVEN, Belgium-Materialise, a pioneer in the medical applications of 3D Printing, has worked together with hand specialist Dr. Verstreken to give children with complex, improperly-healed forearm fractures a fresh chance for a carefree and active childhood. One of these children is 7-year-old Joos. Although he once avoided the use of his badly-healed arm, Joos can no longer tell which arm he had surgery on without looking for the scar.

The beginning of Joos's story is a familiar one for many parents of active young children as it starts when he broke both bones in his left forearm in a playground accident in 2013. Where this story differs is that when the healing process was complete and the cast was removed, it was revealed that Joos had a crooked, improperly-healed arm for which the simplest movements had become impossible. This also left him without feeling in his fingers.

Against the advice of their doctor and physiotherapist who told them that there was nothing to be done, Joos's parents started looking for a way to fix their son's arm and found hand specialist Frederik Verstreken MD (Monica Hospital, Antwerp, Belgium). Dr. Verstreken used Materialise's technology, including 3D surgical planning solutions and 3D printed, patient-specific surgical guides, and Mobelife's 3D-printed, custom-made titanium implants to perform an osteotomy and restore full-functionality to the boy's arm.

The result of the surgery exceeded the parents' expectations. Soon after the surgery, Joos regained the feeling in his fingers, a sensation he had not felt for the previous 6 months, and could once more enjoy life as an active young child. "I had a child with a handicap, now he's a normally functioning boy," Kathleen, Joos's mom, testifies.

In the meantime, Dr. Verstreken has performed four other similar surgeries on children who lacked full mobility in their forearm after double fractures improperly healed. "These cases were so difficult and complex that it would not have been possible to obtain a successful reconstruction using conventional techniques."