

Paradigm shift in cranio-maxillo facial surgery planning – Unravelling the unseen in treatment

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Correction or reconstruction of morphological alteration of the craniofacial skeleton is one of the most challenging fields, with the surgeon having to restore form and function where models prove their value as a surgical planning and custom prosthesis preparation tool. Complex anatomy unique to each person and varies for the same person at different times has traditionally been analyzed in 2D for lack of better methods. Adapting proven reverse engineering, enhanced visualization methods combined with advanced manufacturing technologies as additive manufacturing can greatly benefit the surgeon by unravelling intra operative findings and analyze clinical scenarios ahead of time. Advances in Computer Graphics and Image processing have revolutionized Imaging with the display of 3D objects seen from different angles distances with varying color, lighting and surface properties and gives one the ability to perform complex surgical simulations. Progress in manufacturing techniques with high precision and use of bio compatible materials are revolutionizing surgical planning and custom implants designing and manufacturing. Surgical simulations and anatomical models form a part of the pre surgical planning armamentarium in cases with dysplastic alterations of the skeletal apparatus, complex trauma, tumor defects, functional disorders caused by dysplastic or degenerative etiology and revision implants and multipart corrective osteotomies. Patient specific implants for the reconstruction of craniofacial defects have gained importance due to better performance over their generic counterparts due to, the precise adaptation to the region of implantation, reduced surgical times, and better cosmesis.

This presentation will discuss enhanced visualization methods as applied to craniofacial distraction, orthognathic surgery, complex trauma and developmental defects, transfer surgical simulations to the operating room and manufacturing of custom implants using clinical cases.

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