John Nesan, Oral Health Dent Manag 2015, 14:5
http://dx.doi.org/10.4172/2247-2452.C1.015

5th American Dental Congress

October 05-07, 2015 Philadelphia, USA

Use of 3D-digital technology to design patient specific implants in mandibular reconstruction

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Background: Mandibular tumors are complex and restoration of these resected regions of the mandible can cause defects which are cosmetically visible and can prove to be a challenge to restore functionally. The current practice of reconstruction with a free fibula graft and restoration of dental structures after 6 months can prove to be a challenge to patients. Also, the success of the reconstructed fibula flap depends on a variety of factors.

Objectives: To plan and place a patient–specific implant "PSI" with immediate restoration of form and function and minimizing the need for additional surgical procedures like harvesting of flap.

Methods: Using 3D printing technology and 3D designing software, a patient specific implant was designed and fabricated. Also, the surgery was planned using anatomic models and virtual surgery much before performing the actual surgical procedure.

Results: As a single procedure, the resection and reconstruction of the mandibular segment was done with immediate replacement of the dentition. This resulted in a well restored form and better esthetics as compared to traditional reconstructive methods like fibula implant.

Conclusion: The use of 3D technology to design and fabricate PSI facilitates better esthetics, better surgical outcome and earlier restoration of normal function for the patient. It avoids the needs for a second surgery.

Biography

John Nesan has completed his MDS in the field of Oral and Maxillofacial Surgery from Sri Ramachandra University, Chennai, India. He is also the Director for Centre for Technology Assisted Reconstructive Surgery (CTARS), a 3D design and printing unit with a core focus on healthcare. He is also a Member of Association of oral and maxillofacial surgeons of India and the International congress of oral implantologist.

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