Digital Workflow using advanced Dental Technology – Complete denture fabrication using 3D Printing

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Aim: The aim of the poster is to highlight the 3D printing techniques used in fabrication of complete dentures.

Methodology: The virtual planning process starts with an accurate capture of a patient’s edentulous impressions using 3D intraoral scanners. In addition to the reduced chair time for patients, digital dentistry allows for the storage of electronic data, enabling technicians to precisely duplicate a denture in a matter of hours. Furthermore, variability in quality can be minimized. The scanned impressions are stored in STL format and a 3D printed model is prepared using Ackuretta 3D Printer with laser sintering with QuraBASE (methacrylate based photopolymerised resin) and with each layer printing thickness of 100µ. The Denture base is cleansed with 95% ethyl alcohol, the teeth are separately designed and light cured to the space in the denture base and finished. A disadvantage of a fully digital approach is the lack of a wax try-in.

Conclusion: In relation to optical scanning, it is ideal to scan the master casts as the fabrication of the denture would be following the criteria of selective pressure technique. The 3D printed teeth showed adequate fracture resistance than conventional teeth forms.

References:
2. Fang Qu, BDS, a Xue Du, BDS, b and Wei-Cai Liu, PhDc. 3D-printed custom trays with a Gothic arch for centric relation recording and definitive impression making for complete dentures: A dental technique. Journal of Prosthetic Dentistry. Article in the Press