

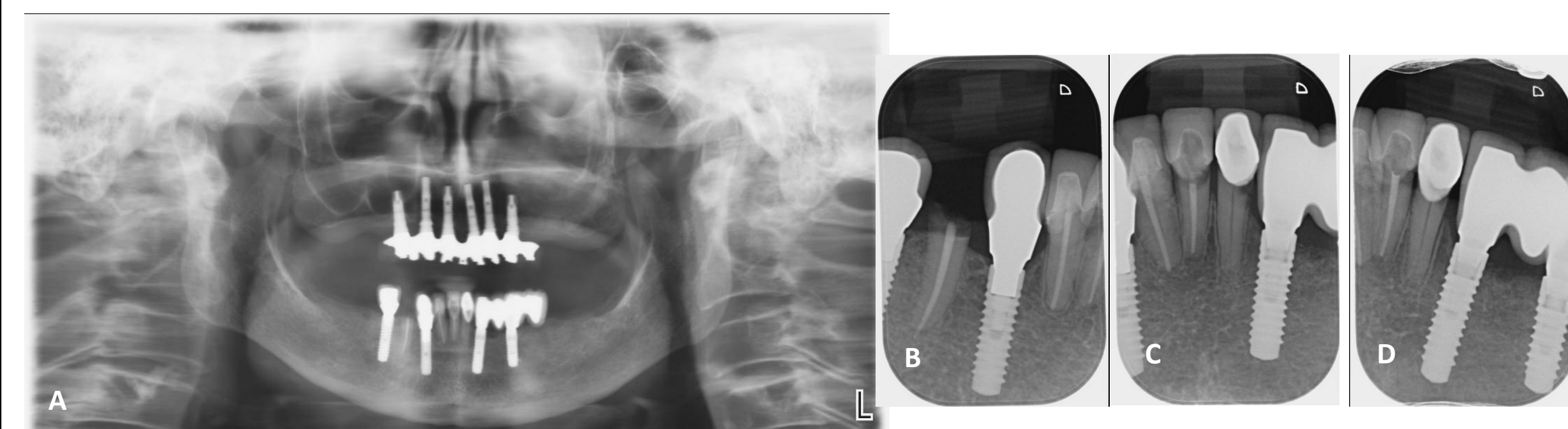
INTRODUCTION

Scleroderma is a chronic, progressive, debilitating connective tissue disease characterised by hardening and contracture of the skin. It can affect the limb extremities leading to reduced manual dexterity whereby patients can exhibit poor oral hygiene and increased risk of caries and periodontal disease. Furthermore, xerostomia, microstomia and constriction distortion of the alveolar ridges make fabrication of conventional dentures challenging as a result of the short sulcular extensions. The dental management of this condition can be frustrating for the patient and clinician due to its psychological impact on their overall well-being and the progressively deteriorating dental status, respectively. The provision of dental implants presents a solution for such patients as they progress to a completely edentulous state. Strategic positioning of implant fixtures can aide the clinician when a full arch implant retained fixed dental prosthesis may eventually be required and eases the transition for the patient to complete edentulism.

METHOD

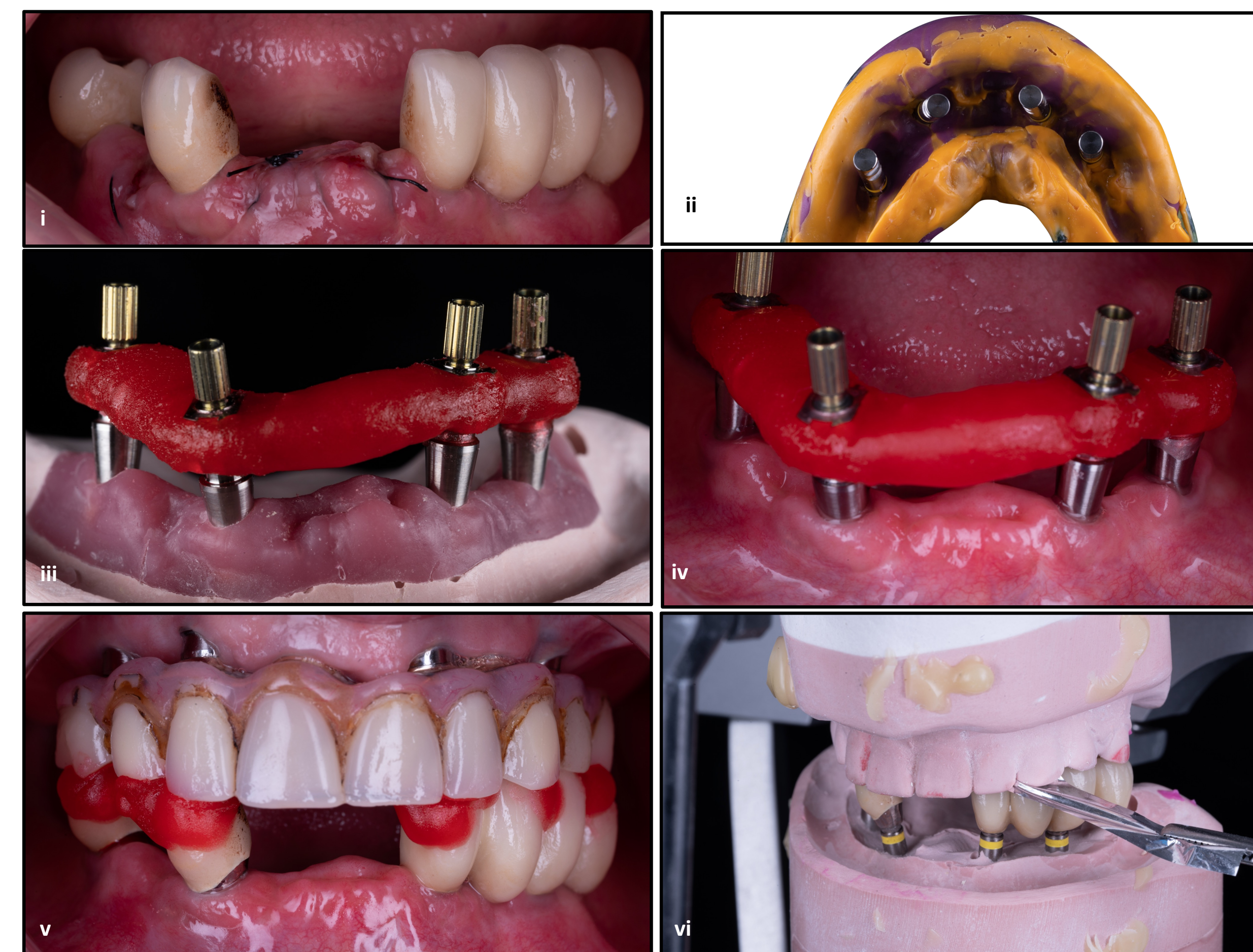
An 84-year-old female was referred to the Prosthodontic Department at the Eastman Dental Hospital due to complex medical and dental needs. She had previously been provided with a maxillary fixed dental prosthesis (FDP) in 2006. Further breakdown of teeth in her mandible lead to a re-referral in 2018 and provision of an implant retained FDP to replace her 32, 33, 34 and 35; and implant retained crowns to replace 43 and 45. The implants were placed taking into consideration the potential for failure of the remaining dentition over the coming years due to dental disease. Ensuring, optimal angulation of the fixtures would allow for an easier transition to a full arch fixed dental prosthesis. In 2021, the patient returned with complaints of pain and discomfort relating to the remaining lower incisors. The progression of dental disease of the remaining natural teeth lead to the decision to provide a mandibular implant-retained FDP following a discussion of all viable treatment options. The strategically positioned implant fixtures in the lower arch ensured that significant angulation corrections were not necessary. The implant components used factored in the limited mouth opening the patient presented with. The presence of the existing restorations in the lower arch was useful in maintaining the existing vertical dimension and a simple solution was used to verify the position for the articulation of the working casts without having to increase significant chair time. Once biological, functional and aesthetic integration was achieved with a milled acrylic provisional bridge, the information was transferred to the final prosthesis for fabrication of the milled acrylic bar.

PRE-OPERATIVE RADIOGRAPHIC IMAGING



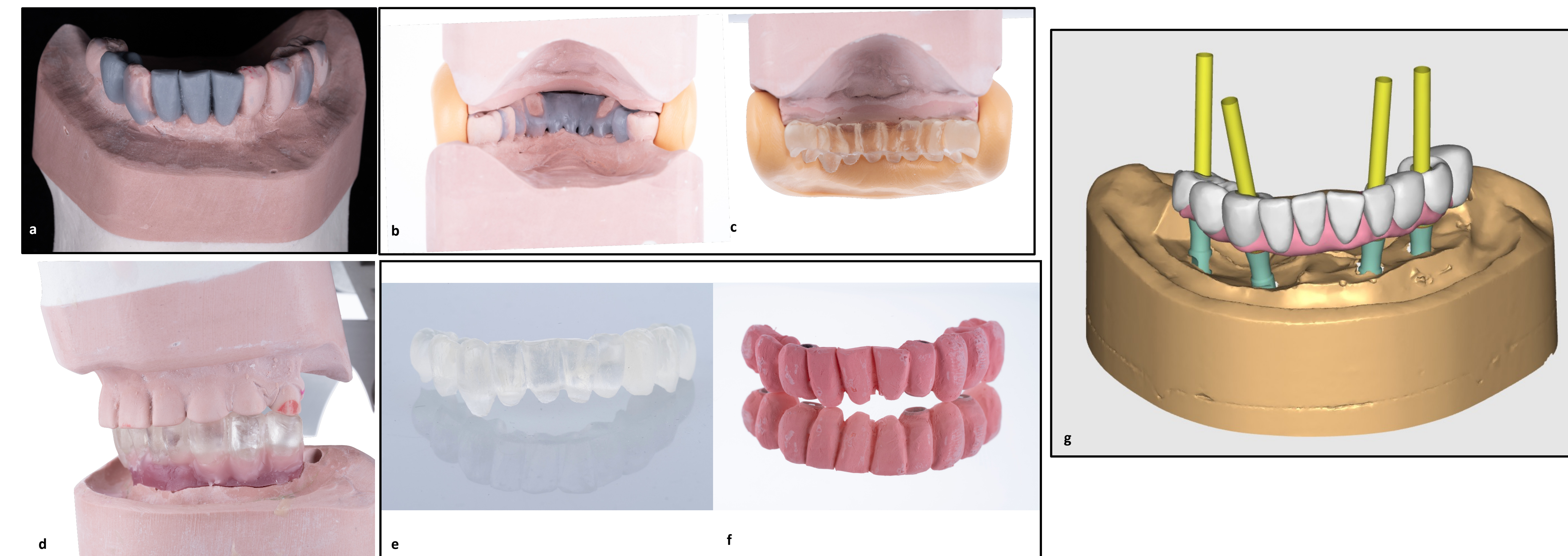
Figures: (A) Preoperative dental panoramic radiograph showing maxillary full arch implant retained restoration, mandibular implant restorations and failing teeth; (B) Preoperative periapical radiograph showing retained root LR3 (C) Preoperative periapical radiograph showing failing lower incisors (D) Preoperative periapical radiograph showing well fitting implant retained bridge replacing LL2-LL5.

(1) IMPRESSION TAKING & JAW REGISTRATION



- **Figures (i)** – Pre-operative dental status of mandibular arch following removal of failing teeth
- **Figure (ii)** – Fixture level impression taken with short narrow cross-fit open tray impression copings (non-engaging) after removal of implant retained crowns and bridge.
- **Figure (iii)** – Fabricated verification jig using pattern resin on working cast
- **Figure (iv)** – One screw test carried out intraorally using verification jig
- **Figure (v)** – Jaw registration at existing OVD using pattern resin
- **Figure (vi)** – Verified jaw registration by confirmation of shimholds on working casts

(2) DIAGNOSTIC & DIGITAL PLANNING



- **Figures (a)** – Diagnostic wax up completed on diagnostics casts.
- **Figure (b)** – Buccal and labial putty index taken of diagnostic casts in occlusion.
- **Figures (c)** – Clear acrylic duplication of planned mandibular prosthesis. Seating confirmed in buccal and labial putty index.
- **Figure (d)** – Clear acrylic duplication placed in correct orientation on mandibular working cast at proposed vertical dimension with temporary cylinders relined with acrylic.
- **Figures (e, f and g)** – Clear acrylic duplication sprayed and scanned for final design process on Exocad software.

(3) RESTORATIVE PHASE

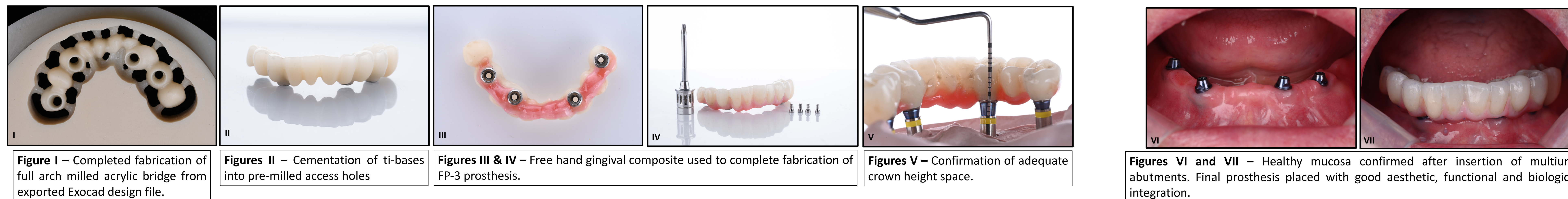


Figure I – Completed fabrication of full arch milled acrylic bridge from exported Exocad design file.

Figures II – Cementation of ti-bases into pre-milled access holes

Figures III & IV – Free hand gingival composite used to complete fabrication of FP-3 prosthesis.

Figures V – Confirmation of adequate crown height space.

Figures VI and VII – Healthy mucosa confirmed after insertion of multiunit abutments. Final prosthesis placed with good aesthetic, functional and biological integration.

RESULTS

Strategic, forward implant planning and adherence to prosthodontic principles is paramount to ensure favourable outcomes in patients presenting with scleroderma and other debilitating oral conditions in which conventional prosthodontic solutions are not suitable and in which medical and dental disease progression is highly likely.

CONCLUSION

The provision of an implant retained fixed dental prosthesis in patients suffering from scleroderma:

- can greatly enhance mastication and make swallowing easier by restoring form and function.
- we can avoid problems relating to prosthesis insertion and removal due to microstomia.
- the prosthesis can be designed to have limited distal extension to avoid access issues.