PP-066 Endocrown-Based Restoration of a Structurally Compromised Tooth Using Additive Manufacturing in a Fully Digital Workflow: A Case Report

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INTRODUCTION: The rapid advancement of digital technologies in dentistry has facilitated the effective integration of CAD/CAM systems into restorative treatment protocols. These systems enable both subtractive and additive manufacturing methods to be incorporated into clinical workflows. Endocrowns, preferred for restoring endodontically treated teeth with compromised structural integrity, offer significant advantages in terms of precision and time efficiency when digitally planned and fabricated.

Case Description: A 33-year-old male patient presented to the clinic with complaints of acute dental pain. Clinical and radiographic evaluations revealed deep dentinal caries and extensive coronal substance loss in the affected tooth, for which endodontic treatment was indicated. Following root canal therapy, an endocrown restoration was selected to preserve the remaining tooth structure and restore functional integrity. The treatment was carried out entirely using a digital workflow. An intraoral scanner (TRIOS® 3 Color, 3Shape, Denmark) was used to capture the digital impression. The restoration was designed using CAD software (Exocad, Germany) and subsequently fabricated using additive manufacturing technology with a 3D printer (Asiga MAX, Australia) and high-precision dental resin. The restoration was cemented using adhesive techniques in a clinical setting.

Discussion: Endocrowns fabricated through a fully digital workflow demonstrate superior accuracy, workflow standardization, and time efficiency compared to conventional methods. Additive manufacturing enables the precise production of complex morphologies, eliminates the need for physical models, reduces material waste, and enhances cost-effectiveness. These restorations exhibit high clinical compatibility and improve patient comfort while reducing operator dependency during production. However, limitations such as high system acquisition costs, the need for technical proficiency, and limited long-term clinical data must be considered for widespread adoption.

Keywords: Endocrown, Digital Dentistry, Additive Manufacturing, CAD/CAM, Minimally Invasive Restoration

PP-067 Esthetic rehabilitation of a traumatized anterior tooth: from porcelain laminate veneer to screw-retained implant crown

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INTRODUCTION: Ideal pink and white esthetics in the anterior maxilla following the extraction of a central incisor is a complex and technique-sensitive process. In cases where root canal treatment has complications tooth extraction, implant placement and prosthetic procedures require an interdisciplinary treatment approach.

Case Description: A 28-year-old female patient underwent orthognathic surgery following the completion of her orthodontic treatment. In 2020, she experienced a traumatic injury that caused the avulsion of tooth 11, which was immediately repositioned. Tooth 12 presented with a crown fracture and teeth 12–22 were splinted on the same day. During the 10-day splinting period, root canal treatment was initiated on tooth 11 and calcium hydroxide was placed in the root-canal. Three weeks later, the treatment was completed. After 1-year, due to a negative vitality test and the development of a periapical lesion, tooth 12 underwent endodontic treatment then porcelain laminate veneers were placed on teeth 14–24. One year later, tooth 11 showed significant discoloration, negatively affecting the esthetics, internal root resorption was observed and retreatment was performed. The porcelain laminate veneer on tooth 11 was repeated to improve color harmony. Although masking effect was limited compared to a crown, this conservative approach preserved tooth structure and achieved acceptable esthetics. Dramatically, due to cervical root resorption and perforations, extraction of tooth 11 was required two years later. An immediate implant(4×15 mm;Nobel TiUltra Active) was placed and a temporary composite crown was fabricated. After 3-months, a screw-retained zirconia crown was delivered for tooth 11 and porcelain laminate veneers on teeth 12, 21 and 22 were repeated to re-establish esthetics in the anterior zone.

Discussion: Immediate implant placement with provisionalization contributed to soft tissue preservation. Combined with adjacent porcelain laminate veneer replacement, a successful esthetic outcome was achieved despite the challenges associated with prior trauma and resorption.

Keywords: Dental implant, Esthetics, Dental trauma