Simultaneous placement of a screw-retained implant-supported crown to replace a failing mandibular left deciduous second molar and a crown on the adjacent mandibular left permanent first molar.

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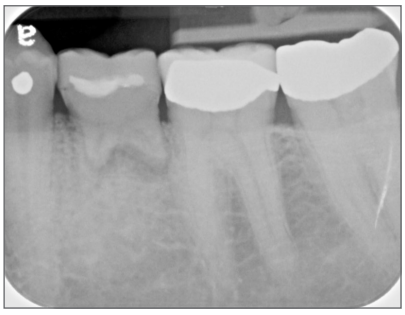
A patient in his early forties presented with pain when chewing on the mandibular left deciduous second molar. Clinical examination revealed open margins and secondary caries on a failing mandibular left deciduous second molar metal-ceramic crown, as well as on the mandibular left permanent first molar metal-ceramic crown (Tooth # 30). Probing depths were within normal limits. However, a periapical radiograph revealed a periapical radiolucency on the mandibular left deciduous second molar. (Fig. 1-3)

Fig.1 Buccal view.

Fig. 2 Occlusal view.

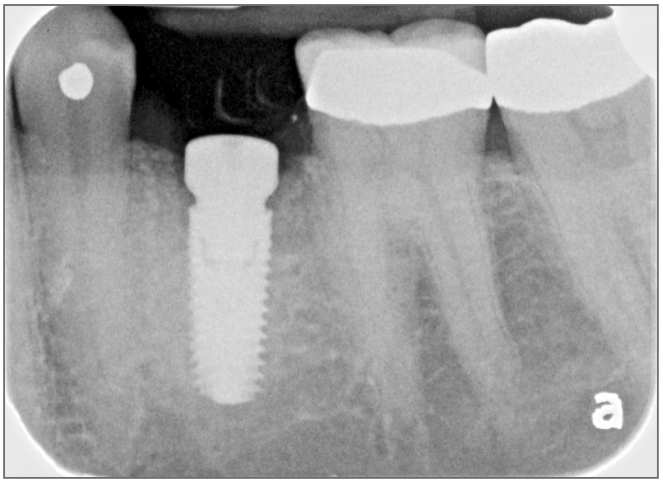
Fig. 3 Periapcial radiograph.



Pre-operative view of a crowned mandibular left deciduous second molar with a failing crown with secondary caries.

Diagnostic impressions were made for the purpose of facilitating the fabrication of a surgical guide and a provisional restoration. Subsequently, the mandibular left deciduous second molar was extracted, and using a CBCT and a surgical guide a 5.0 mm by 11.5 mm MIS C1 WP implant was placed subcrestally; since CONNECT abutments were not available yet in the market, a 4.0 mm height 5.5 mm healing abutment was torqued to 10 Ncm and the soft tissue reapproximated and sutured around the healing abutment. (Fig. 4)

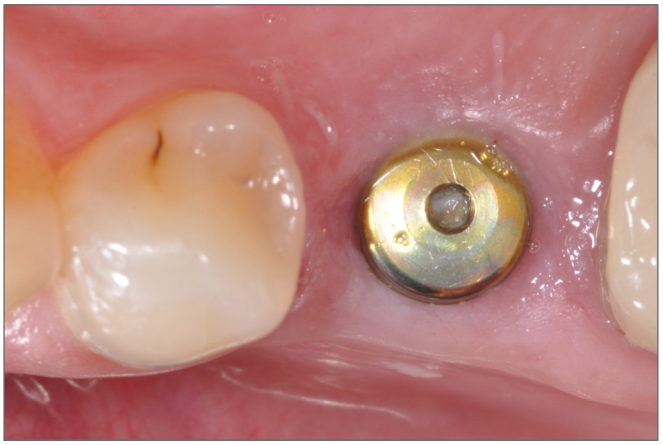
Fig. 4



Post-operative periapical radiograph after extraction of the mandibular left deciduous second molar and immediate placement of a MIS C1 WP 5.0 mm by 11.5 mm.

Four months after implant placement, the patient was presented for reevaluation of the implant and soft tissue and ISQ level of 83 confirmed the implant integration and stability. (Fig. 5-6)

Fig. 5



Occlusal view of the healing abutment 4 months after implant placement.

Fig. 6

Buccal view of the healing abutment 4 months after implant placement.

An engaging closed tray impression coping was placed and torqued to 20 Ncm, and a closed-tray polyvinyl siloxane (PVS) impression was made. Subsequently, an implant-supported screw-retained CAD/CAM acrylic-resin provisional crown was fabricated and delivered to the patient with the main goal of shaping of the soft tissue while assessing function, health, and aesthetics. (Fig. 7-8)

Fig. 7

Buccal view of the screw- retained implant-supported crown.

Fig. 8

Lingual view of the screw- retained implant-supported crown.

Three months later, when initial soft tissue maturation was achieved, the failing crown on the mandibular left permanent first molar was removed, secondary caries was removed, and the tooth was prepared for a zirconia crown. Subsequently, the provisional implant-supported crown was removed, an engaging customized closed tray impression coping was placed and torqued to 20 Ncm, and a closed-tray PVS final impression was made for both the implant and tooth. (Fig. 9-10)

Fig. 9

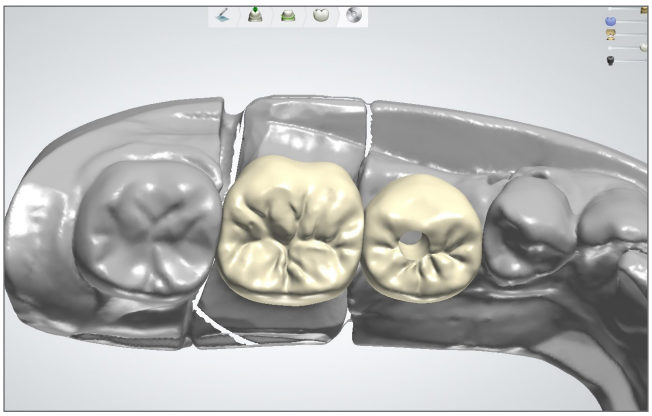
Buccal view of a customized closed tray impression coping to capture the emergence profile generated by provisional crown. PVS final impression was made for both tooth and implant.

Fig. 10

Buccal view of the CAD design taking into account the emergence profile transferred to the lab via the customized impression coping.

A monolithic zirconia (Katana STML, Kuraray Noritake) crown was fabricated for the mandibular left permanent first molar, and a monolithic zirconia (Katana STML, Kuraray Noritake) screw-retained implant-supported crown (bonded to a 1.5 mm in height Ti-base) was fabricated to replace the mandibular left deciduous second molar. (Fig. 11)

Fig. 11



Occlusal view of the CAD design for a monoithic zirconia crowns. Note the implant-supported crown screw access hole.

To mitigate excess cement complications stemming from cementing the monolithic zirconia on the mandibular left permanent first molar, following a try-in procedure, the implant-supported crown was placed first, the screw was manually tightened, and the zirconia crown for the mandibular left permanent first molar was bonded (Panavia SA Plus and Clearfil Universal Bond Quick). Subsequently, the implant-supported crown was removed and all excess cement removal, especially at the mesial aspect of the mandibular left permanent first molar, was confirmed. Afterwards, the screw-retained implant-supported crown was placed and the screw was torqued to 30 Ncm followed by the restoration of the screw access hole with PTFE tape and direct composite-resin. (Fig. 12-13)

Fig. 12

Occlusal view of the definitive monolithic zirconia screw-retianed implant-supported crown and the crown on the mandibular left permenant first molar.

Fig. 13

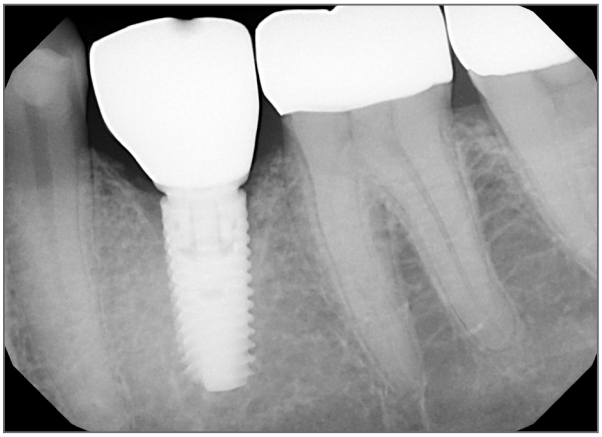
Buccal view of the definitive screw-retianed implant-supported crown. Note the soft tissue contours and health .

2-Year Follow up after restoration delivery.

Fig. 14

Buccal view 2 years after restorations' delivery.

Fig. 15



Post-operative periapical radiograph at 2 years follow-up.

Ceramics: Cusp Dental Laboratory. Malden, MA, USA.