Guided Bone Regeneration using Polydeoxyribonucleotide (PDRN) for Implant Installation : A Clinical Case Report

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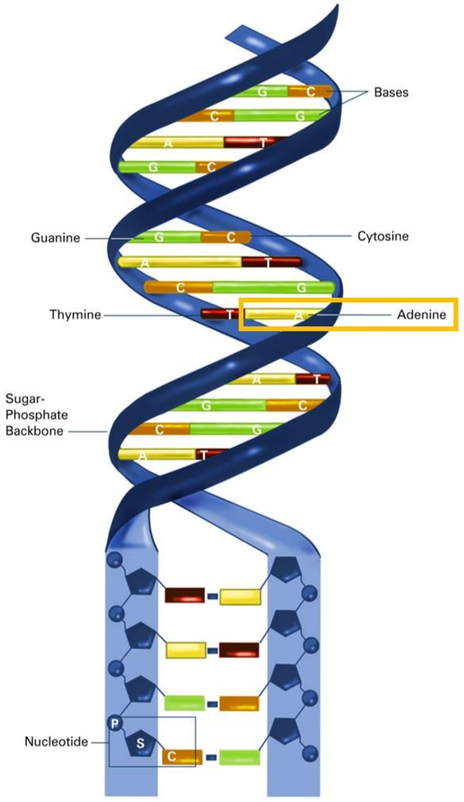

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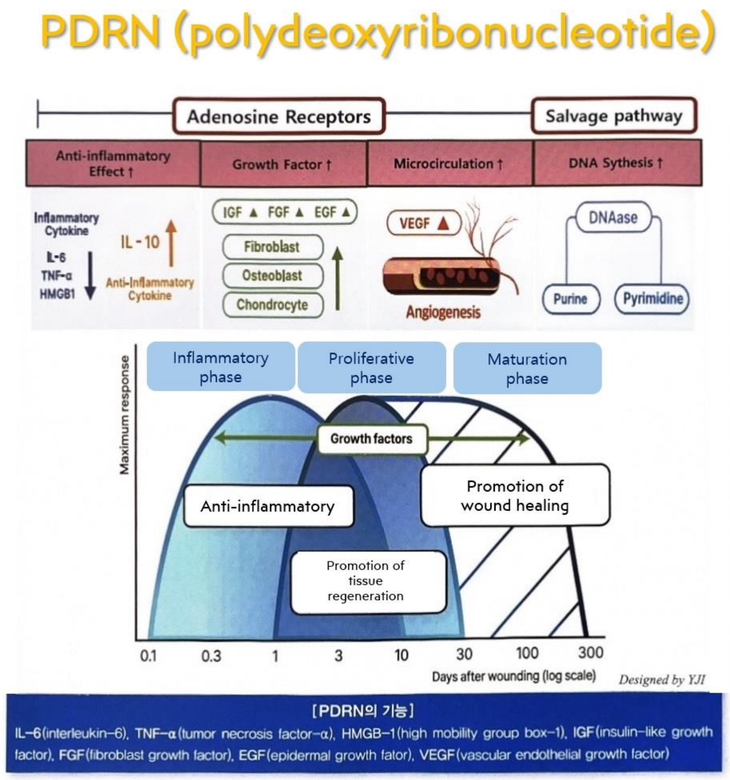

The first step of PDRN for dental practitioners

Introduction

Polydeoxyribonucleotide (PDRN) is a linear DNA-derived polymer known for its regenerative properties. It consists of a mixture of purines, pyrimidines, deoxyribonucleotides, and deoxyribonucleosides [1].

PDRN facilitates DNA synthesis and repair, thereby promoting cellular proliferation and growth in damaged or hypoxic tissues through the salvage pathway. This metabolic route allows PDRN to supply nucleotides to cells that are unable to independently synthesize DNA, utilizing its degradation products [2].

Recent in vitro and animal studies have demonstrated its beneficial effects on bone healing, particularly in bone defects, either alone or in combination with other regenerative materials [3,4].

This approach applies PDRN to guided bone regeneration procedures for implant placement to enhance bone healing and osseointegration.

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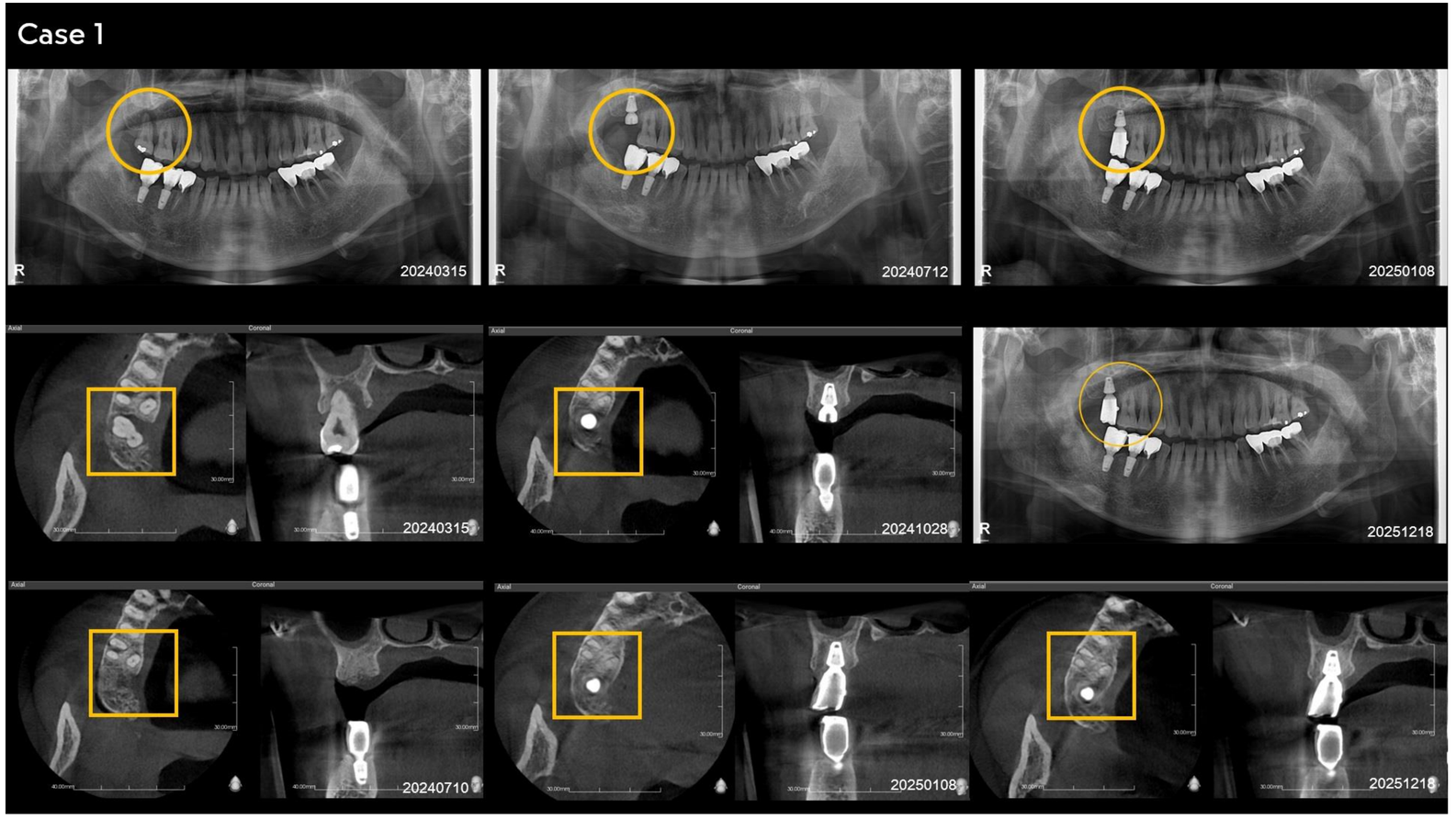

case 1

#17 (tooth numbered by FDI World Dental Federation notation) was extracted and socket preservation was done with PDRN (Cellvane Inj. ,ZERONE CELLVANE)-soaked allograft (RenewOss, RENEW MEDICAL) on March, 2024. Implant (SuperLine, DENTIUM) was placed through a minimally invasive flapless approach and PDRN (Cellvane Inj. ,ZERONE CELLVANE) was injected around implant on July, 2024. Screw-cement retained prosthesis was delivered on January, 2025.

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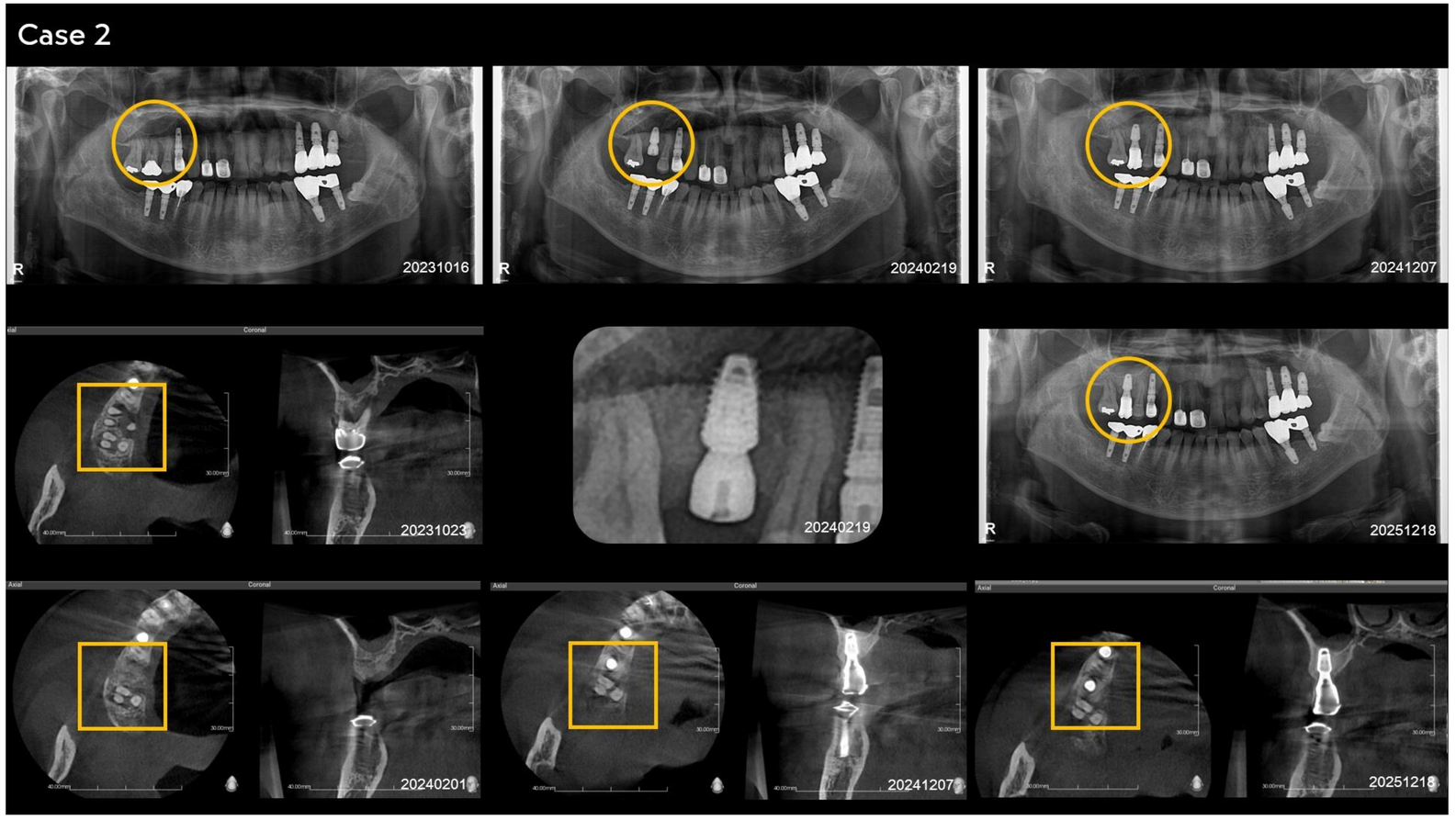

case 2

#16 (tooth numbered by FDI World Dental Federation notation) was extracted and socket preservation was done with PDRN (Cellvane Inj. ,ZERONE CELLVANE)-soaked allograft (RenewOss, RENEW MEDICAL) on October, 2023. Implant (SuperLine, DENTIUM) was placed with crestal sinus lifting through a minimally invasive flapless approach on February, 2024. Screw-cement retained prosthesis was delivered on July, 2024.

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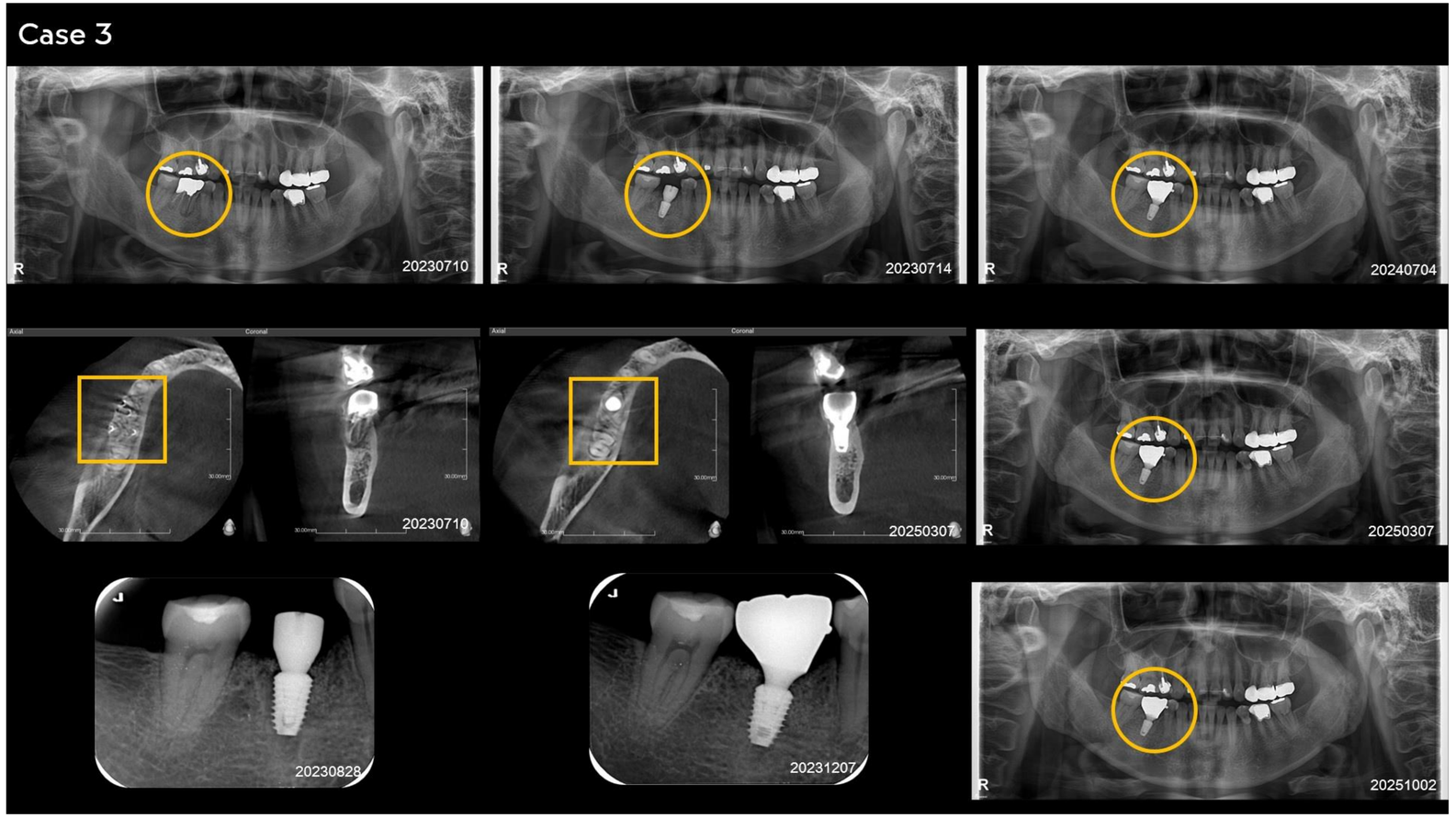

case 3

#46 (tooth numbered by FDI World Dental Federation notation) was extracted and immediately implant (SuperLine, DENTIUM) was placed with PDRN (Cellvane Inj. ,ZERONE CELLVANE)-soaked alloplastic graft (OSTEON 3, GENOSS), absorbable membrane(Collagen Membrane2, GENOSS) and PDRN (Cellvane Inj.,ZERONE CELLVANE) was administered around the extraction socket on July, 2023. Screw-cement retained prosthesis was delivered on November, 2023.

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Results

The CBCT view of case1 and 2 shows successful bone regeneration in the mesiopalatal area and clinically stable osseointegration around implant. In case 3, maturation of graft material and new born was observed in buccal area. Horizontal bone dimension of palatal area of case 1,2 and buccal area of case was improved.

Clinical outcomes of GBR using PDRN for implant installation was favorable.

Conclusion

Based on three cases, PDRN was considered to exert a clinically meaningful effect in immediate implant placement and alveolar ridge preservation. The application of PDRN appears to promote bone regeneration for implant installation. Within the limitation of these exploratory cases, this case reports suggests that PDRN may serve as a new biomaterial for guided bone regeneration (GBR). Further studies with larger sample sizes and longer follow-up periods are required to validate these findings.

References

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