Decision tree for early loading protocols in everyday practice

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INTRODUCTION

As patients expect shorter time to teeth, fewer visits, enhanced function and esthetics, current innovations in dental implantology focus on accelerating osseointegration while minimizing tissue damage during the implantation process. A non-traumatic osteotomy preparation with a low-speed (50 rpm) drill, in contrast to conventional drill protocols, eliminates the need for irrigation thus preserving the coagulum, a mixture of bone chips, connective tissue stroma, and blood to enhance the osteogenic potential[1]. This can lessen bone damage, and along with a gradually anodized, moderately rough TiUltra implant surface on the apex, promote fast osseointegration, thus enabling early loading.

METHODS & MATERIALS

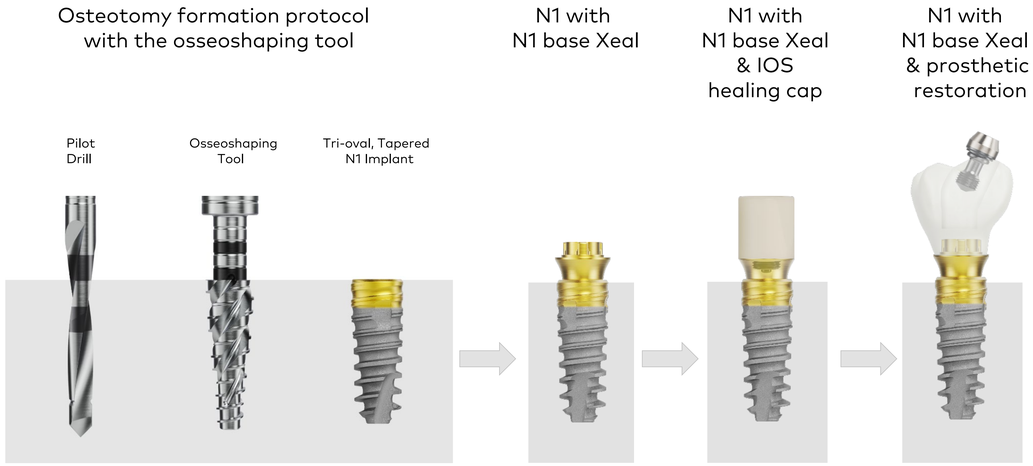

Figure 1. The single-tooth Nobel Biocare N1 implant workflow. Implants were restored with the N1 base Xeal or a Multi-unit Abutment Xeal and all received an iOS healing cap. Prior to prosthesis delivery, iOS scans were acquired.

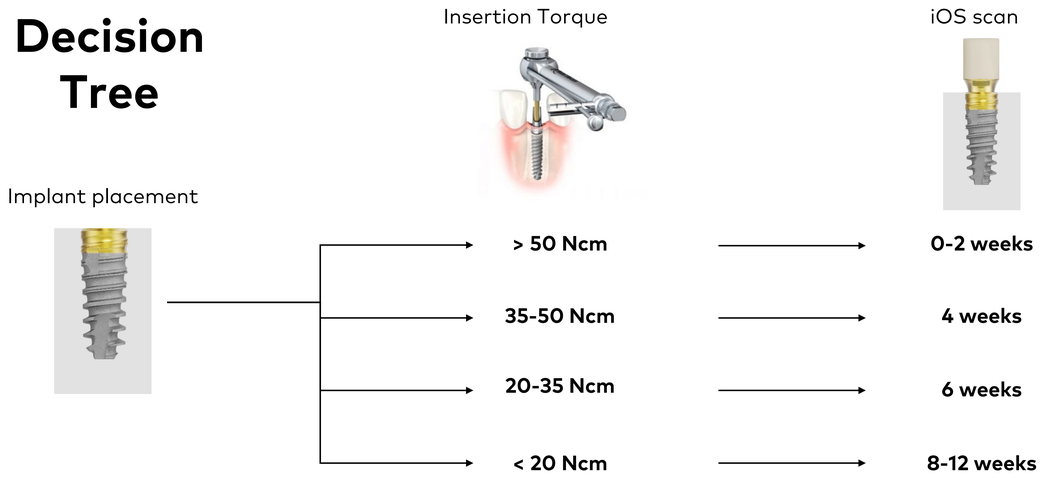

Figure 2. Insertion torque-dependent timing for iOS digital impression, indicative of suitability for final prosthesis delivery within 2-3 weeks.

Presented at AO 2024 (S1)

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CLINICAL CASE: < 20 Ncm

At iOS Scan | **At Final Prosthesis Delivery**

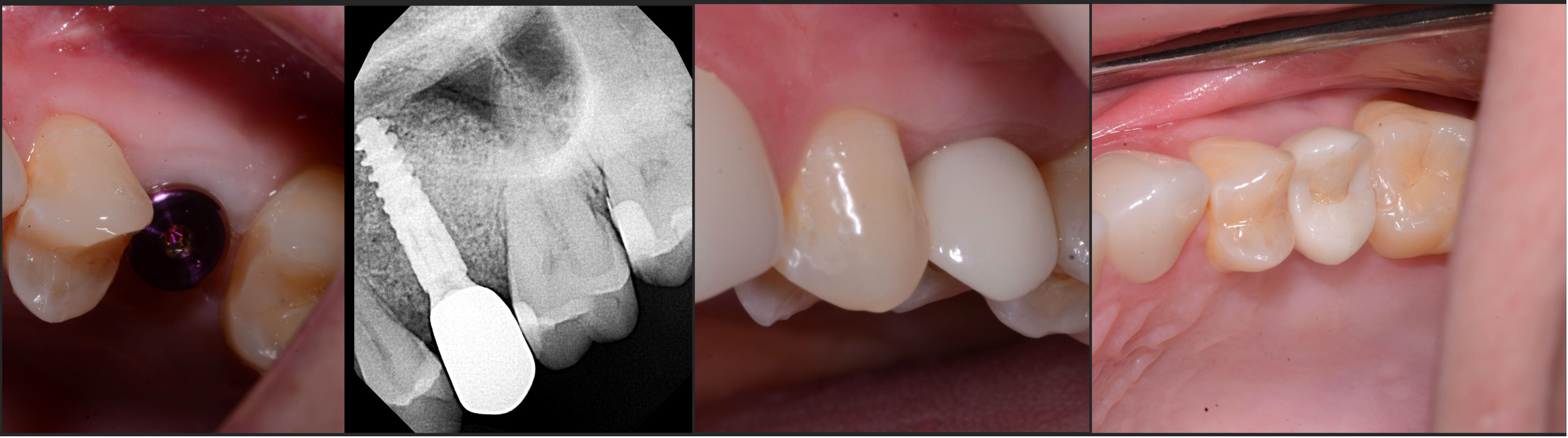

Figure 3. A 40–year–old female smoker presented with a missing second premolar at position 13. A trioval geometry Nobel Biocare N1 implant 3.5x13 mm was placed using a low-speed site preparation protocol reaching a final insertion torque of 19 Ncm. N1 base Xeal 1.75 mm was placed on the day of surgery. Two months later, the iOS scan was acquired, and the site was cleared for restoration. The final prosthesis was delivered 3.9 months after the surgery by a referring clinician.

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CLINICAL CASE: 20-35 Ncm

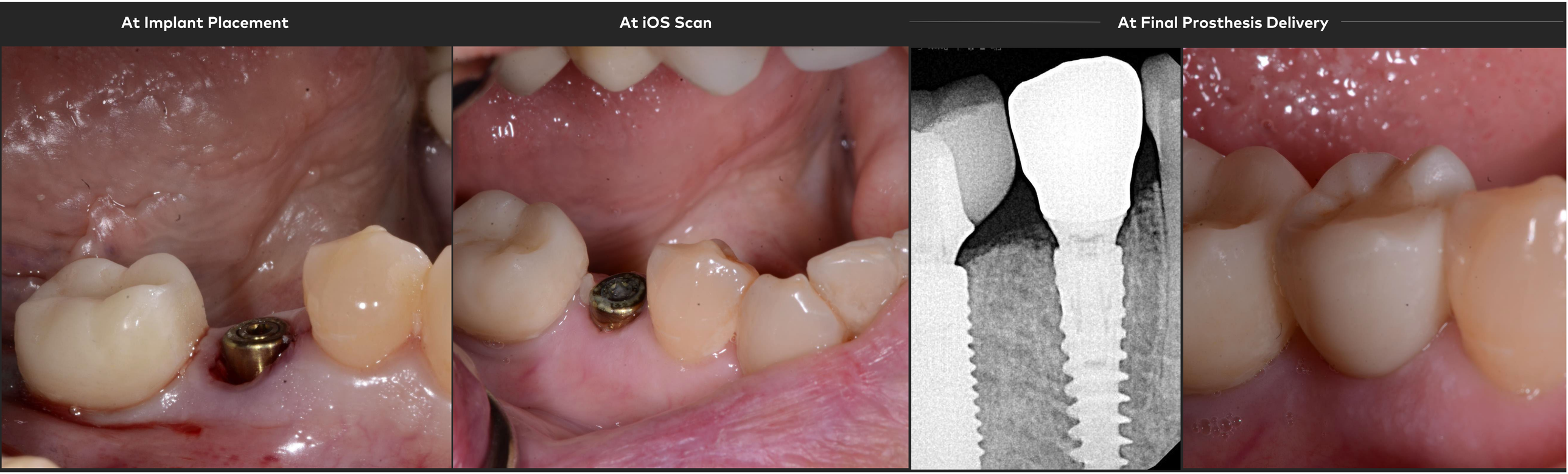

Figure 4. A 76-year-old non-smoking patient received a 4.0x13 mm trioval geometry Nobel Biocare N1 implant at position 29 with a final insertion torque of 35 Ncm. The implant was fitted with a 1.75 mm N1 base Xeal on the day of surgery. After 1.5 months, the iOS scan was acquired, and the site was cleared for restoration. The final prosthesis was delivered 3.7 month after the surgery by a referring clinician.

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CLINICAL CASE: 35-50 Ncm

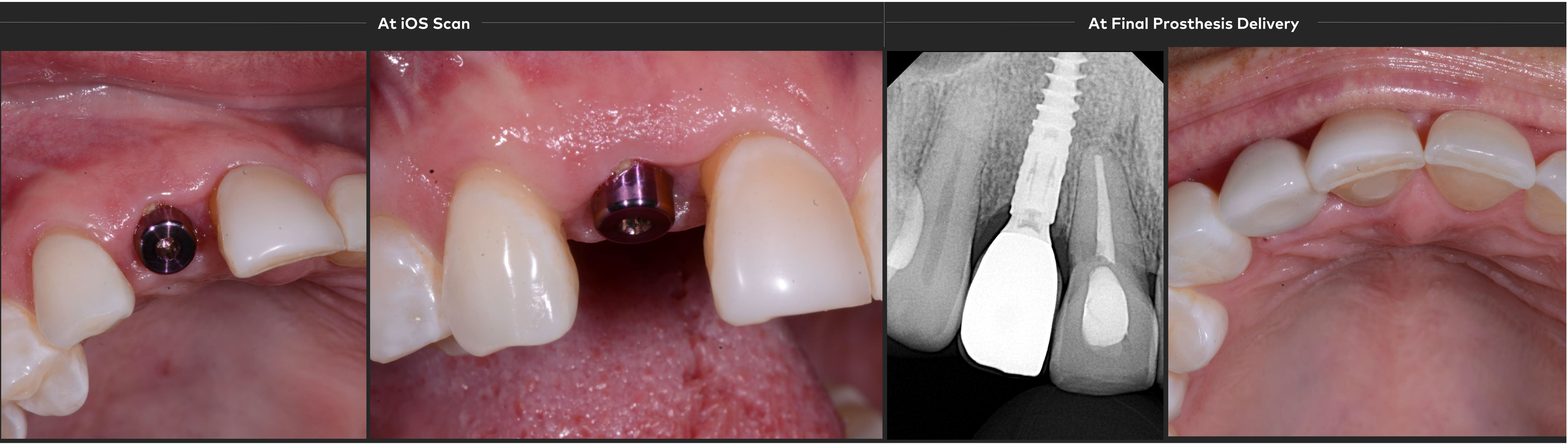

Figure 5. A 47-year-old non-smoker female received a trioval geometry Nobel Biocare N1 implant at position 7 placed with a final torque of 42 Ncm using a low-speed site preparation protocol. The implant was fitted with a 1.75 mm N1 base Xeal. After 1.4 months, the iOS scan was acquired, and the site was cleared for restoration. The final prosthesis was delivered 3.7 months later by a referring clinician.

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CLINICAL CASE: >50 Ncm

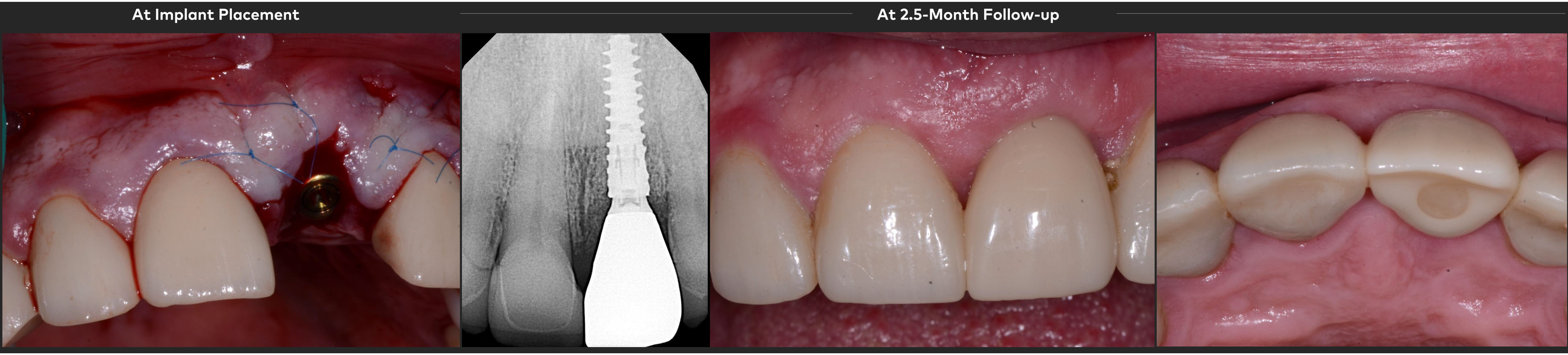

Figure 6. A 63-year-old non-smoker male received a 4.0x15 mm trioval geometry Nobel Biocare N1 implant at position 9 placed at a final insertion torque of 70 Ncm. The implant was fitted with a 1.75 mm N1 base Xeal on the day of surgery. iOS scan was acquired 2 weeks later, and the site was cleared for restoration. The final prosthesis was delivered 0.9 months later by a referring clinician.

CONCLUSION

The final insertion torque values reached during the non-traumatic low-speed drill implant insertion can facilitate clinical decision-making by predicting adequate timing for final prosthesis delivery. An early loading decision tree addresses the growing expectations of patients, who want shorter time to teeth and fewer visits, and it aims to implement a more formularized clinical workflow, especially within the expanding referral network.

REFERENCES

1. Fabbri, G, Staas, T, Urban, I (2022) A Retrospective Observational Study Assessing the Clinical Outcomes of a Novel Implant System with Low-Speed Site Preparation Protocol and Tri-Oval Implant Geometry. *J Clin Med.* 11 (16):4859

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