Journal of Dental Sciences 20 (2025) 1370–1372

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jds.com

Correspondence

Immediate implant at a three-rooted mandibular molar: A case report with 7-year follow-up

KEYWORDS
Immediate implant;
Three-rooted mandibular molar;
Case report

The prevalence of short roots, fused molar roots, and three-rooted mandibular molars is relatively high in Asian populations.[1] These anatomical variations may lead to unfavorable periodontal prognosis, increasing the likelihood of tooth extraction and implant therapy at these sites. Furthermore, these unique anatomical features may result in reduced available bone and decreased primary stability for immediately placed implants. Specifically, Cone beam computed tomography (CBCT) is crucial for evaluating factors such as the proximity of the extraction site to the maxillary sinus and inferior alveolar canal, socket morphology, the availability of sufficient interradicular septal bone, and the presence of lingual concavities.[2] All factors should be carefully considered prior to immediate implant placement. Long-term studies assessing the clinical outcomes of immediate molar implants in Asian populations with unique root morphologies are scarce. This long-term case report aims to evaluate the clinical and radiographic outcomes of an immediate implant placed in a three-rooted mandibular molar of a Taiwanese patient.

A 52-year-old male patient presented with a root fracture in a three-rooted mandibular first molar, rendering the tooth non-restorable and unsuitable for endodontic treatment (Fig. 1A). CBCT was used to evaluate factors such as special root morphologies, the presence of lingual concavities, proximity to the inferior alveolar canal, socket morphology and availability of sufficient interradicular septal bone. After the careful extraction of the tooth, a type B socket was identified (Fig. 1B).[3] A pilot drill was used to access the center of the residual root septum, followed by the preparation of the implant bed. Subsequently, a cylindrical screw-type implant was immediately placed. The socket defect was then filled with alloplastic graft material and covered with a collagen membrane. The interdental papillae were sutured with 4-0 polytetrafluoroethylene sutures for wound stabilization (Fig. 1C). Six months later, the final crown was delivered. Clinical and radiographic evaluations at the 7-year follow-up showed healthy mucosa with minimal tissue recession and marginal bone loss (Fig. 1D).

This case report showed good clinical and radiographical implant outcome with no biological and technical complications. A higher prevalence of three-rooted mandibular first molars was observed in the Taiwanese population (approximately 20%–25%) compared to Caucasian populations (around 4%).[1] In a systematic review and meta-analysis of Caucasian populations, Ragucci et al. reported a mean survival rate of 96.6 % for immediate implants after one year of follow-up, with a mean marginal bone loss of 1.29 ± 0.24 mm.[4] In a cross-sectional analysis conducted 2–10 years post-implantation, Parvini et al. found that 4.2% of patients experienced peri-implantitis, while 6 % of implants exhibited 1 mm of mucosal recession.[5] Impact of three-rooted mandibular molars on clinical outcome and

https://doi.org/10.1016/j.jds.2024.11.028

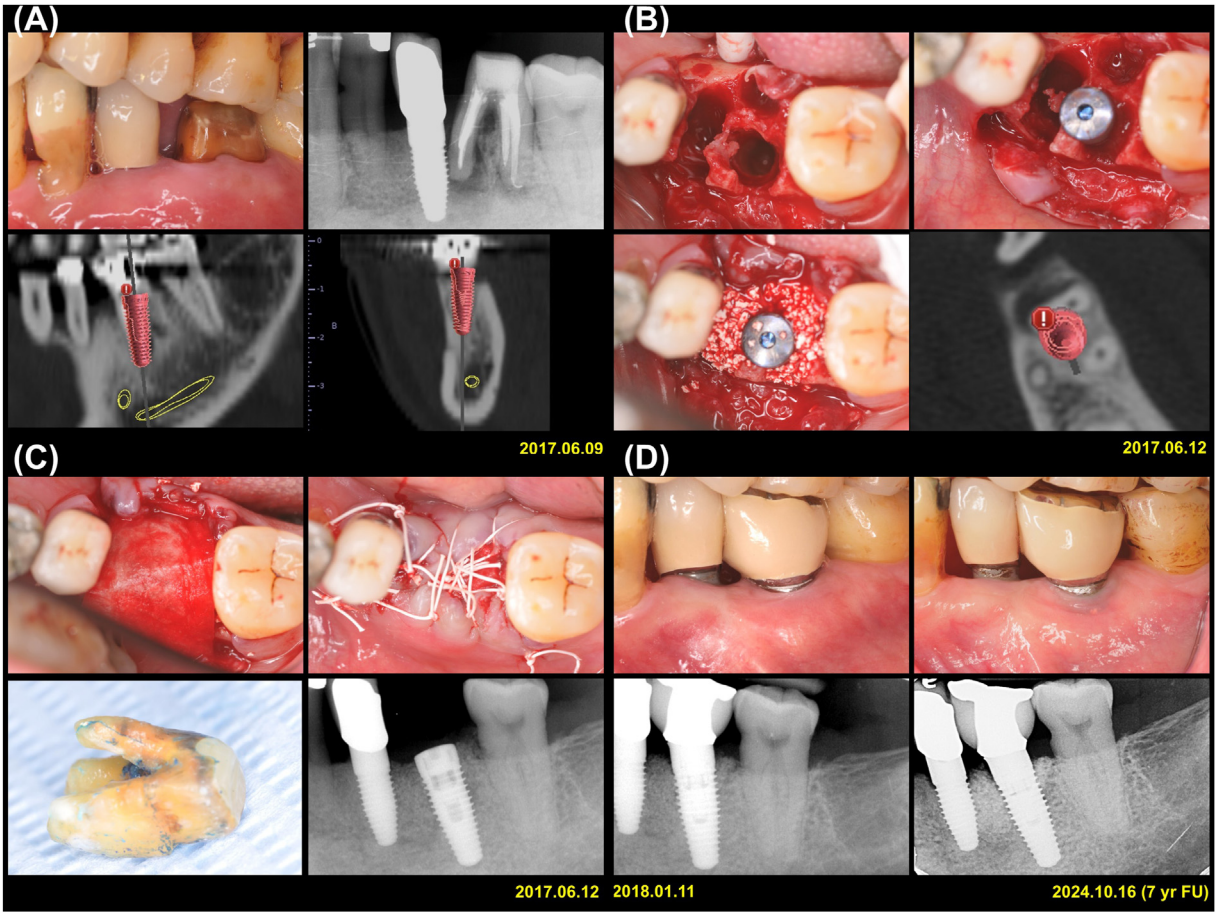

Figure 1 Clinical photographs and radiographs of our patient. (A) A 52-year-old male patient presented with a root fracture in a three-rooted mandibular first molar, rendering the tooth non-restorable and unsuitable for endodontic treatment. Cone beam computed tomography was used to evaluate factors such as special root morphologies, the presence of lingual concavities, proximity to the inferior alveolar canal, socket morphology and availability of sufficient interradicular septal bone. (B) After the careful extraction of the tooth, a type B socket was identified [4]. A pilot drill was used to access the center of the residual root septum, followed by the preparation of the implant bed. Subsequently, a cylindrical screw-type implant was immediately placed. The socket defect was then filled with alloplastic graft material and covered with a collagen membrane. (C) The interdental papillae were sutured with 4-0 polytetrafluoroethylene sutures for wound stabilization. (D) Six months later, the final crown was delivered. Clinical and radiographic evaluations at the 7-year follow-up showed healthy mucosa with minimal tissue recession and marginal bone loss.

peri-implantitis in immediate implant placement has not been previously reported. Although the molar extraction site in this study displayed unique root anatomy and a type B socket, neither was associated with an increased risk of marginal bone loss and peri-implantitis. This case report is the first to confirm that immediate molar implant placement is an effective and predictable treatment modality for a Taiwanese patient with unique root morphology. Although a three-rooted molar socket may pose additional challenges for immediate implant placement, meticulous planning and the application of a well-structured treatment protocol can lead to successful long-term outcomes.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

Acknowledgments

There is no funding for this case report.

References

1. Dung SZ. Variations in dental morphology among Asians: periodontal considerations. In: Dung SZ, ed. *Asian aspects of periodontology and implantology*. Taiwan: Airiti Press, 2017: 135—40.
2. Ho JY, Ngeow WC, Lim D, Wong CS. Anatomic considerations for immediate implant placement in the mandibular molar region: a cross-sectional study using cone-beam computed tomography. *Folia Morphol* 2022;81:732—8.
3. Smith RB, Tarnow DP, Sarnachiaro G. Immediate placement of dental implants in molar extraction sockets: an 11-year retrospective analysis. *Comp Cont Educ Dent* 2019;40:166—70.

4. Ragucci GM, Elnayef B, Criado-Cámara E, Del Amo FS, Hernández-Alfaro F. Immediate implant placement in molar extraction sockets: a systematic review and meta-analysis. *Int. J. Implant Dent.* 2020;6:40.
5. Parvini P, Obreja K, Becker K, Galarraga ME, Schwarz F, Ramanauskaite A. The prevalence of peri-implant disease following immediate implant placement and loading: a cross-sectional analysis after 2 to 10 years. *Int. J. Implant Dent.* 2020;6:63.

Shing-Zeng Dung*
Department of Dentistry, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City, Taiwan
Department of Surgery, College of Medicine, Tzu Chi University, Hualien, Taiwan
College of Dentistry, National Yang Ming Chiao Tung University, Taipei, Taiwan
Department of Stomatology, Taipei Veterans General Hospital, Taipei, Taiwan

Ting-Hsin Huang
Department of Dentistry, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City, Taiwan

*Corresponding author. Department of Dentistry, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, No. 289, Jianguo Rd., Xindian Dist., New Taipei City 23142, Taiwan.
E-mail address: tonyangela0103@gmail.com (S.-Z. Dung)

Received 24 November 2024
Final revision received 25 November 2024
Available online 4 December 2024