ASDJ
AINSHAMS DENTAL JOURNAL

Print ISSN 1110-7642
Online ISSN 2735-5039

AIN SHAMS DENTAL JOURNAL
Official Publication of Ain Shams Dental School
March2025 • Vol. 37

Removing Pick-up Impression Coping in Patients with Limited Mouth Opening: A Technical Report

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Due to its precision, the "pick-up" implant impression technique is often preferred for transferring the impression coping from the implant to the impression. However, this technique is limited to patients with sufficient mouth opening and intraoral accessibility, with the transfer method instead used in cases with opening restrictions. Some patients have sufficient mouth opening to accommodate the special tray and pick-up impression coping but lack access for the screwdriver. This technical report introduces a new pick-up implant impression approach for patients with limited intraoral access, in which a needle holder is used with a sliding motion to loosen copings out of position. In this way, clinicians can use the more precise open-tray impression method, even in patients with limited intraoral accessibility.

Keywords: Technique, dental impression, dental implants

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Introduction

The fabrication of precisely seated implant-supported prostheses significantly affects their long-term success.[1-3] One critical step in this process is the accuracy of the impression technique used. Current implant impression methods include both digital and conventional approaches.[4-8] Optical implant impressions tend to be more comfortable for patients and are also quicker, cheaper, and more accurate than elastomeric impressions,[9] although accuracy data are limited.[1,10,11]

Conventional implant impression techniques are still commonly used in practice and include open-tray (pick-up or direct) or closed-tray (transfer or indirect) methods.[2,12] Each approach has its advantages and disadvantages.[2,13] The open-tray approach has been shown to be more precise than the closed-tray method.[2,12] However, in patients with limited mouth opening or access, the open-tray impression technique is not always possible, leaving the less precise closed-tray approach as the alternative option.[14]

To overcome this problem, the open-tray approach has been modified to enable its use in patients with limited mouth opening.[15] Such modifications include the use of closed-tray impression copings (shorter copings compared with open-tray copings) and creating slots for screwdriver access with resin extensions. In this latter approach, the extensions can easily be shortened to accommodate mouth opening and are later removed to allow access with a screwdriver and retrieval of impression copings with the impression in an open-tray approach.[15]

Nevertheless, in some cases of limited mouth opening, the space available for the impression coping and its guide pin is less of a problem than the limited space available to loosen the coping out of position with a screwdriver. To overcome this limitation, the author developed a guide pin-loosening method using a needle holder to easily remove pick-up impression copings from implant fixtures in patients with restricted mouth opening. To illustrate the approach, the removal of an open-tray coping with a needle holder is described for a right mandibular posterior implant-supported crown.

Technique description

A first mandibular right molar was deemed non-restorable, and a plan was formulated to replace it with an implant-supported crown. After osseointegration of the implant fixture (Noble Biocare, Kloten, Switzerland), the prosthetic phase was commenced. First, the seating and fit accuracy of the special tray was assessed, including where best to position a hole for accessibility of the impression coping guide pin. Then, the healing abutment was removed, and the pick-up impression coping was positioned into the implant fixture (Nobel Biocare). Next, the guide pin was tightened and hand-secured into position following the manufacturer's instructions (Noble Biocare). The position of the special tray and accessibility of the guide pin through the created hole was reassessed and adjusted as needed to facilitate easy seating and retrieval. A definitive fixture-level impression with polyvinyl siloxane impression material was taken (Exafast NDS, GC Dental, Luzern, Switzerland).

Later, the guide pin was removed with the Baumgartner or Halsey needle holder (Medesy, Maniago, Italy). The needle holder was opened, and the serrated jaw tip of the holder was positioned at the notched part of the guide pin before sliding the holder tip against the guide pin (Figure 1A, B). The process was repeated until the guide pin loosened. The impression was then removed from the patient's mouth and sent to the laboratory for fabrication of the implant-supported prosthesis.

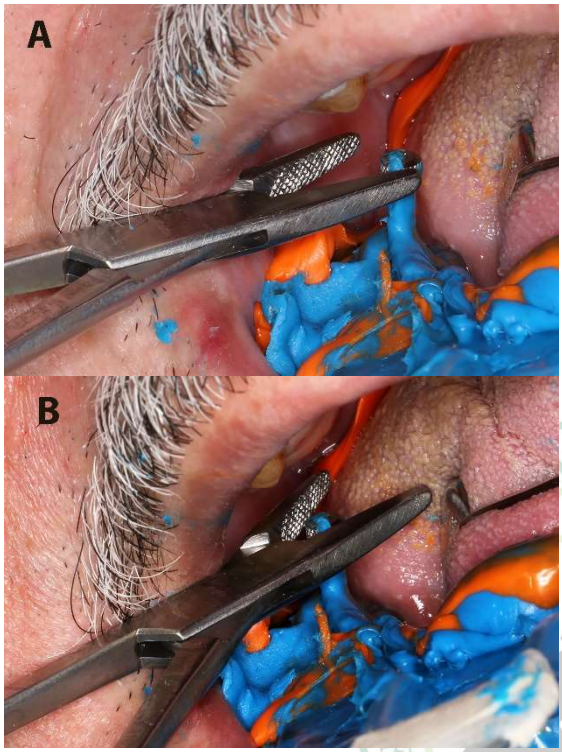

Figure 1: The pick-up impression coping was removed with a needle holder. A: The tip of the needle holder's jaw was positioned on the serrated part of the guide pin. B: The needle holder jaw slid along the guide pin to unscrew it.

Discussion

The most accurate implant impression technique for various clinical presentations is still debated.[16-18] However, the open-tray impression technique is generally regarded as more accurate than the closed-tray impression technique in cases with multiple implants.[18,19] Due to its accuracy, the direct impression method has been modified by several investigators to enable its use on more patients and in patients with limited mouth opening.[15]

The technique described here used a needle holder to remove the guide pins. This approach is fast and simple and enables clinicians to still use the open-tray impression method and exploit its accuracy. The inherent cross-hatched design of the jaw tip of the needle holder allows engagement with the notches present in the guide pins, thus facilitating rotation of the pin as the needle holder tip slides along its surface. Thus, when using the suggested approach, a needle holder can be used in cases with sufficient mouth opening or accessibility for impression coping pick-up and guide pins but insufficient space to accommodate the screwdriver to remove the posts from position. This approach is best used with implant systems that have notched guide pins such as Prima and Noble Biocare. However, smooth guide pins could also be roughened and notched with a carbide burr prior to removal with a needle holder.

Bhansali et al[15] suggested using closed-tray impression copings for an open-tray impression technique. They suggested preparing resin extensions that could be shortened to accommodate the patient's mouth opening, which would then allow access for a screwdriver to copings and their retrieval with the impression as pick-up copings. This modification is useful in patients with multiple implants and with varying mouth opening restrictions. However, the approach is technically challenging and requires extra time for preparation. The technique presented here, when used in carefully selected patients, requires no modification of the open-tray impression technique other than using the needle holder to unscrew the impression posts.

The intraoral loosening approach for pick-up impression copings used a needle holder instead of a screwdriver to accommodate limited intraoral accessibility. The use of the needle holder to unscrew impression copings allowed utilization of a direct impression technique in a patient with limited mouth opening.

Conclusion

A Baumgartner or Halsey needle holder was used to remove pick-up impression copings to fabricate a right mandibular posterior implant-supported crown. The use of the needle holder to screw-out impression copings preserved the use of a direct impression technique in a patient with limited mouth opening.

Declaration

Authors declare no conflict of interest

Funding
This report had no funding body

Data availability
Additional data will be made available on request

Ethics approval and consent to participate
The King Abdulaziz University Faculty of Dentistry (KAUFD) ethical and research committee approved the research proposal (protocol # 002-13) and a verbal consent was taken from the patient.

Competing interests
We report no conflict of interest.

References
1. Flugge T, van der Meer WJ, Gonzalez BG, Vach K, Wismeijer D, Wang P. The accuracy of different dental impression techniques for implant-supported dental prostheses: A systematic review and meta-analysis. *Clin Oral Implants Res.* 2018;29 Suppl 16:374-392. 10.1111/clr.13273
2. Kim JH, Kim KR, Kim S. Critical appraisal of implant impression accuracies: A systematic review. *J Prosthet Dent.* 2015;114(2):185-192 e181. 10.1016/j.prosdent.2015.02.005
3. Maiorana C, Speroni S, Herford AS, Cicciu M. Slow Orthodontic Teeth Extrusion to Enhance Hard and Soft Periodontal Tissue Quality before Implant Positioning in Aesthetic Area. *Open Dent J.* 2012;6:137-142. 10.2174/1874210601206010137
4. Arcuri L, Lorenzi C, Vanni A, Bianchi N, Dolci A, Arcuri C. Comparison of the accuracy of intraoral scanning and conventional impression techniques on implants: a review. *J Biol Regul Homeost Agents.* 2020;34(1 Suppl. 1):89-97 DENTAL SUPPLEMENT.
5. Elsheikh MM, Elsheikh AM. Clinical Working Time and Patient Satisfaction Outcomes: A Crossover Trial Comparing Digital and Conventional Implant Impression Techniques. *Ain Shams Dental Journal.* 2024;35(3):277-283.
6. Ragab R, Shaker A, ElKhashab M. Four Digital Intraoral Scanners versus Conventional Impression Technique: An In-Vitro Evaluation of Fit Accuracy on Multiunit Abutments for Cross Arch Implant Restorations. *Ain Shams Dental Journal.* 2024;35(3):324-333.
7. Rutkunas V, Geciauskaite A, Jegelevicius D, Vaitiekunas M. Accuracy of digital implant impressions with intraoral scanners. A systematic review. *Eur J Oral Implantol.* 2017;10 Suppl 1:101-120.
8. Wulfman C, Naveau A, Rignon-Bret C. Digital scanning for complete-arch implant-supported restorations: A systematic review. *J Prosthet Dent.* 2020;124(2):161-167. 10.1016/j.prosdent.2019.06.014
9. Lee SJ, Gallucci GO. Digital vs. conventional implant impressions: efficiency outcomes. *Clin Oral Implants Res.* 2013;24(1):111-115. 10.1111/j.1600-0501.2012.02430.x
10. Alikhasi M, Alsharbaty MHM, Moharrami M. Digital Implant Impression Technique Accuracy: A Systematic Review. *Implant Dent.* 2017;26(6):929-935. 10.1097/ID.0000000000000683
11. Sawase T, Kuroshima S. The current clinical relevancy of intraoral scanners in implant dentistry. *Dent Mater J.* 2020;39(1):57-61. 10.4012/dmj.2019-285
12. Moreira AH, Rodrigues NF, Pinho AC, Fonseca JC, Vilaca JL. Accuracy Comparison of Implant Impression Techniques: A Systematic Review. *Clin Implant Dent Relat Res.* 2015;17 Suppl 2:e751-764. 10.1111/cid.12310
13. Papaspyridakos P, Chen CJ, Gallucci GO, Doukoudakis A, Weber HP, Chronopoulos V. Accuracy of implant impressions for partially and completely edentulous patients: a systematic review. *Int J Oral Maxillofac Implants.* 2014;29(4):836-845. 10.11607/jomi.3625
14. Raviv E, Hanna J, Raviv R, Harel-Raviv M. A clinical report on the use of closed-tray, hex-lock-friction-fit implant impression copings. *J Oral Implantol.* 2014;40(4):449-453. 10.1563/AAID-JOI-D-11-00056
15. Bhansali S, Bhansali SP, Negi P. A modified open tray implant impression technique for limited mouth opening. *J Prosthet Dent.* 2017;118(1):116-117. 10.1016/j.prosdent.2016.09.030
16. Gedrimiene A, Adaskevicius R, Rutkunas V. Accuracy of digital and conventional dental implant impressions for fixed partial dentures: A comparative clinical study. *J Adv Prosthodont.* 2019;11(5):271-279. 10.4047/jap.2019.11.5.271
17. Roig E, Alvarez-Maldonado N, Garza LC, Valles M, Espona J, Roig M. Impact of design and length on the accuracy of closed tray transfer copings. *J Clin Exp Dent.* 2019;11(8):e707-e712. 10.4317/jced.55588
18. Tafti AF, Hatami M, Razavi F, Ebadian B. Comparison of the accuracy of open-tray and snap-on impression techniques of implants with different angulations. *Dent Res J (Isfahan).* 2019;16(6):413-420.
19. Jacobson Z, Peterson T, Kim WD. Positioning jig for implant abutments: procedures and clinical applications. *J Prosthet Dent.* 1996;75(4):435-439. 10.1016/s0022-3913(96)90038-4