

“One-Day” implant surgical stent for a local clinic

Sang-ki Byun, Hyun-kyung Park, Jeong-min Seo, Woo-hyun Park, Yung-Bin Lee

Department of Advanced General Dentistry, National Police Hospital, Seoul, Korea

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BACKGROUND

An implant stent is necessary for the ideal top-down treatment approach. Especially when the cooperation between the surgeon and the prosthodontist occurs, the surgical stent is of utmost importance for the success of the prosthesis.

As dental implants are becoming an increasingly common treatment, several relevant techniques have been developed. Among them, there is a customized surgical stent for each patient on sale. This surgical aid is fabricated based on the CT scan data¹⁾. For instance, Nobel bio-guide (Nobel Biocare, Sweden) is one of such stents²⁾. (Fig. 1) However, many dental clinics cannot currently afford purchasing a CT scanner. This has motivated many different implant manufacturers to develop a simpler device accurately and easily directing the drilling and implant installation. There still remains an additional cost

for purchasing a CT scanner, though this can also guide to a more accurate drilling and implant installation in the needed location and orientation. Even with using the surgical guide based on the CT scan data, there is no room for occlusal considerations.

Therefore, this paper introduces a “one-day” stent that can be simply and economically fabricated and used in a local dental clinic without CT scanners; this stent can render a room for occlusal considerations and help ensure the correct angulation of an implant drill. The procedure for fabricating the “one-day” stent is as follows:

First, maxillary and mandibular impressions to produce plaster casts from dental impression of each patient’s operation site are obtained. Then, the models are mounted into an articulator to find out the occlusal relationships, vertical dimension for the operation site, and the relationship between the opposing dentition. (Fig. 2)

After mounting the models, a resin tooth of man-

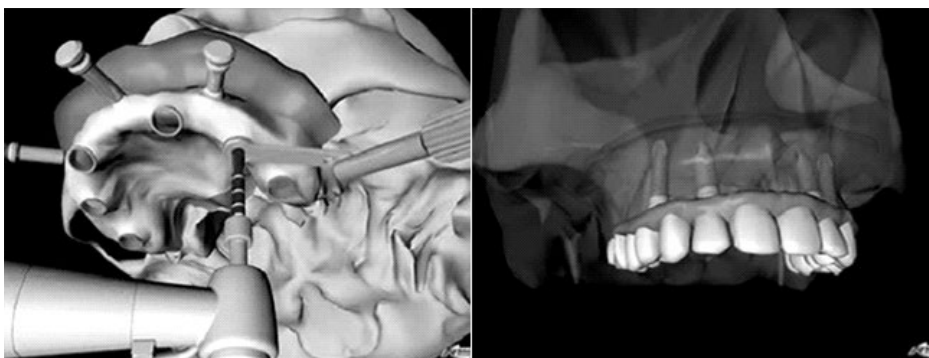


Fig. 1. Novel bioguide.

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Correspondence to: Sang-ki Byun, Department of Advanced General Dentistry, National Police Hospital, 58, Garakbon-dong, Songpa-gu, Seoul 138-708, Korea. Tel: +82-2-3400-1287, Fax: +82-2-3400-1111, E-mail: coolman_korea@hotmail.com

dibular molar that is produced from investing clear resin (Ortho-jet, Lang, USA) into a tooth mold is selected. This should be followed by fixing the resin tooth in the position according to the ideal occlusal relationships with utility wax. (Fig. 3)

After the fixation, the models are removed from the articulator. A transparent splint plate with a 2 mm-thick Biocryl, Scheum Germany) should then be vacuum-compressed over the model, completing the surgical stent. (Fig. 4)



Fig. 2. Model mouting.

The holes are prepared in the stent, considering the location and angulation of an implant. In this study, the holes are widened using a small denture bur with a 2.3 mm diameter (MC261CE, NTL, Germany). The standard diameter of a bur shank for a low-speed hand-piece is 2.3 mm. The placement and direction of implant drills can be decided during the surgery, after a guide drill and the 2-mm twist drill are used with the help of the surgical stent. The diameter of guide drills and the 2 mm twist drill is mostly 1.85 mm, depending on the manufacturing company. Consequently, these drills should pass through the holes that were prepared with the bur shank in a larger diameter. However, too often they cannot pass through or get stuck in the holes. This is why the surgical stent works only for the purpose of radiologic diagnosis, not for the surgery.

Admittedly, some clinicians use the stent during surgery by cutting away its buccal side, and the precise location and direction can often be compromised. The holes made by the bur shank are not wide enough to compensate for the difference in the insertion angles between bur shanks and implant drills. Therefore, this study facilitates the implant stent procedure during surgery by widening



Fig. 3. One day implant stent stage 1.



Fig. 4. One day implant stent stage 2.

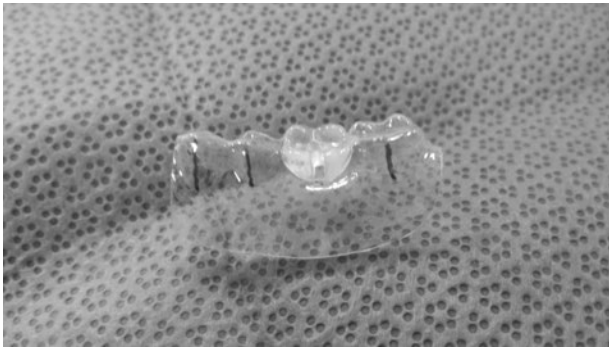


Fig. 5. Final implant stent.

the holes with a denture bur (023 size, 14 mm, NTI): it contributes to smooth drilling by maintaining the original angulation prepared in the stent. (Fig. 5)

DISCUSSION

Whenever possible, self-fabrication of an implant stent, even for a very simple implant case, is highly recommended. The results of this study give clinicians a chance to ponder the case. The stent at stake must be fabricated for successful implant treatment in multiple edentulous cases, distal free-end edentulous cases, and maloc-

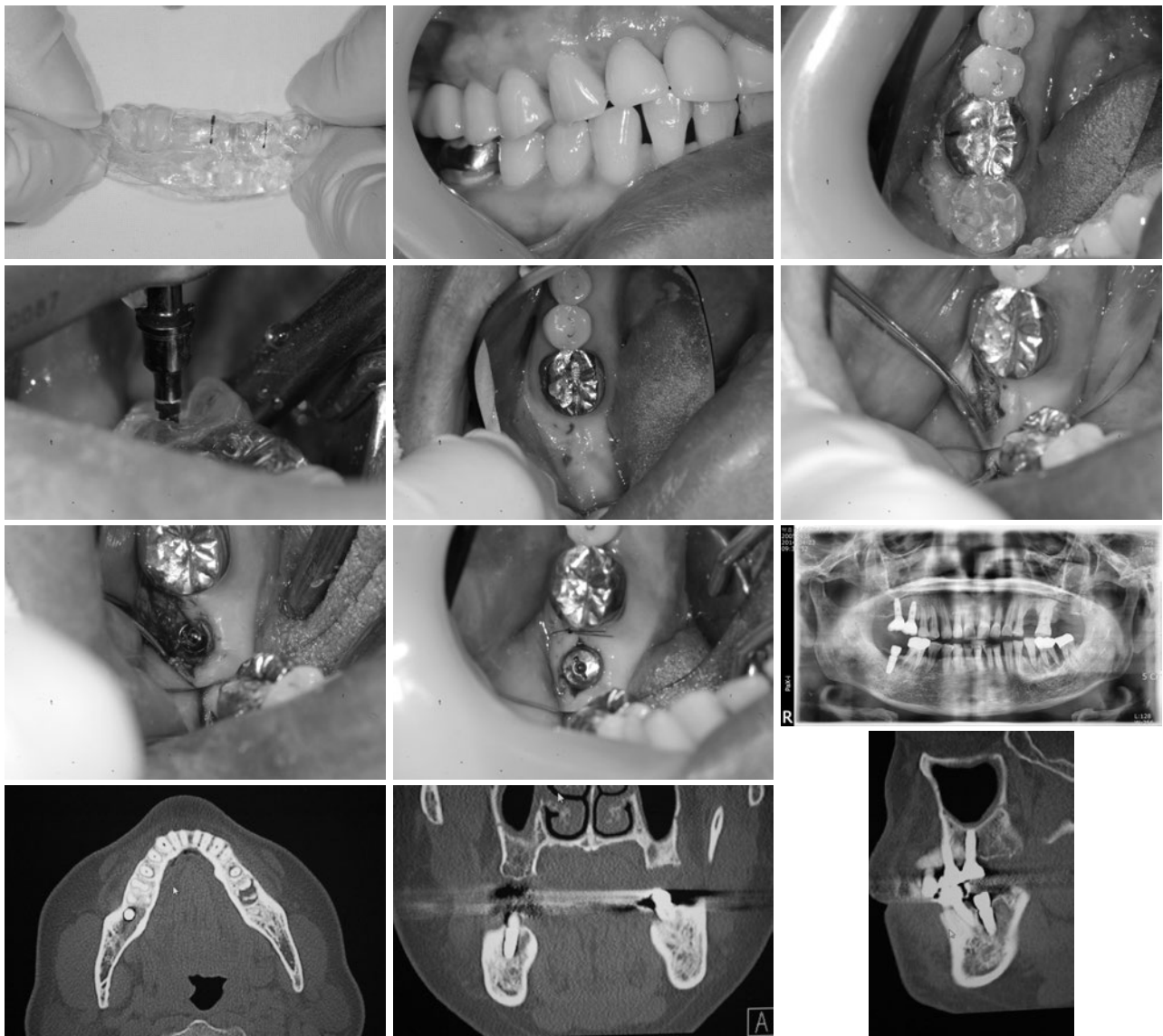


Fig. 6. Clinical case of one day implant stent.

clusion cases (Fig. 6, #47 free-end area case)³⁾.

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