Intraoral welding and linguized (lingual contact) occlusion: a case report

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Intraoral welding was developed by Pierfrugli Mondariz of Genoa, Italy, in the 1970s to permanently connect submerged implants and abutments to a titanium wire or bar by means of an electric current (Fig. 4). The current is used to permanently fuse the titanium to the abutments in microseconds, so the heat generated does not cause any pathology or patient discomfort.

If possible the implants are placed without flaps. The titanium wire or bar is bent and aligned passively to the contour of the labial and lingual surfaces of the implants before applying the electric current to permanently connect titanium implants.

The technique follows a strict surgical and prosthodontic protocol, which includes using a number of implants, at least three, to avoid failures; the number of teeth to be replaced, achieving primary stability by engaging both cortical plates (bicorticalization); immediate splinting of the implants utilizing intraoral welding and immediate insertion of a fixed provisional prosthesis with satisfactory occlusion. The technique provides for immediate loading and does not jeopardize the integration process. Although intraoral welding has been used successfully in Europe, especially Italy, for many years, it has yet to achieve everyday use in the United States.

Members of the Italian affiliate of the American Academy of Implant Prosthodontics, NuovoGISI, have long and successful experiences using successfully implants connected together by intraoral welding.2

By inserting the prosthesis with adequate retention and stability the same day as the surgery, patient complaints and discomfort can be avoided or substantially reduced. The instantaneous stability that results from the splinting can reduce the risk of failure during the healing period. Intraoral welding can also eliminate errors and distortions caused by unsatisfactory impression making, as the procedure is performed directly in the mouth.

Intraoral welding can fulfill a great need for business and socially active patients. The instantaneous stability of the prosthesis can eradicate the risk of failure during the healing period. Intraoral welding also eliminates errors and distortions, caused by unsatisfactory impression making, as the procedure is performed directly in the mouth.

Fig. 1. Schematic drawing of Mondani intraoral solder unit
Fig. 2. Preoperative panoramic radiograph of 10-year-old caucasian woman
Fig. 3. Nonrestorable teeth visible after removal of the patient’s prosthesis
Fig. 4. Eight titanium one-piece implants are inserted.
Fig. 5. Immediate stabilization of the eight implants and two additional implants previously inserted in the posterior regions, by welding each implant to a 2.5 mm supporting titanium bar.
Fig. 6. Panoramic radiograph after 90 days suggests complete integration
Fig. 7. Healthy gingiva was observed after 90 days
Fig. 8. Lower implants welded together intraorally
Fig. 9. Three-tooth mandibular fixed prosthesis
Fig. 10. Seven-year follow-up radiograph shows satisfactory preservation of bone surrounding all of the implants.
Fig. 11. Intraoral photograph of the definitive prosthesis shows healthy gingiva
persons, as the surgical and prostho-
dontic procedures are accomplished on the same day. Patients can leave the dental office with an esthet-
ic and retentive prosthesis.

The flapless technique, first pro-
poved by Tramonti1 can be per-
formed when the bony crest is wide and an adequate amount of attached gingiva is present. The technique al-
lores for painless healing, a redu-
tion of postsurgical inflammation and only moderate inconvenience for the patient, who can eat efficient-
ly the same day.

Provisional prostheti
Provisional prostheses and teeth arrangement
During the session a tem-
porary removable prosthesis is inserted. Occlusal plane height must be cor-
rect. A lingualized (lingual contact) scheme of occlusion is recommend-
ed. There are two areas of the upper anterior teeth that are best arranged without any vertical overlap. The amount of horizontal overlap is determined by the jaw real-
ationship; a vertical overlap for ap-
pearances can be used, provided that an adequate horizontal overlap is in-
cuded to avoid any interference within the functional range.

Lingualized (lingual contact) occlusion
Lingualized (lingual contact) occlusion maintains the esthetic and food penetration advantages of anatomic teeth while maintaining the me-
chanical freedom of nonanatomic teeth. Among the advantages of a lingualized occlusion are occlusal forces centered over the ridge crest in centric occlusion, masticatory force is effectively transferred more “lingual” to the ridges during work-

ing side excursions, the “mortar and pestle” type of occlusion minimizes the occlusal contact area provid-
ing for more efficient food broken penetration and elimination of the precise incisal gap that can com-
plicate the arrangement of anatomic occlusion.

Lingualized occlusion also prevents cheek biting by holding the buccal mucosa off the food table by elimin-
ing occlusal contacts on the maxillary buccal cusps,-transmits maxillary discharges created from errors in jaw relationships, denture processing changes and settling of the denture base, and simplifies set-
ting of denture teeth, balancing the occlusion and any subsequent oc-
clusal adjustments.

Clinical report
A healthy 70-year-old caucasian woman presented for treatment at the office of one of the co-authors (LDC) with a mobile, painful, 12-tooth empericalo-ceramic fixed prosthesis (Fig. 1). The prosthesis was removed and all of the remain-
ing abutment teeth were found to be recontamobilized with extraction in-
dicated (Fig. 2). After removal of the retained teeth eight single-piece implants were inserted in one ses-
sion (Fig. 2).

Immediate stabilization of the eight implants and two additional implants that were previously inserted in the posterior regions was achieved by weld-
ing (Fig. 14) into a three-tooth Implant Hybrid (Trident, Tiber, Italy) each implant to a 1.5 mm supporting titanium bar (Acerboni, Casargo, Italy), which previously had been bent to fit pas-
sively on the palatal mucosa (Fig. 3).

A provisional resin prosthesis was inserted, which provided an accept-
able vertical dimension and lingual contact occlusion. Oral hygiene pro-
cedures were demonstrated to the patient and reviewed at all future ap-
pointments.

After 90 days, a panoramic radiograph suggested complete integra-
tion (Fig. 6) and a healthy mucosa was observed (Fig. 7). The definitive full-arch gold-ceramic maxillary prosthesis was inserted, which great-
ly pleased the patient and her family.

In the lower arch, the right first and second bicuspids were extracted and implants placed in the first bicuspids and first molar regions. The implants were welded together intraradially (Fig. 8), followed by the fabrication and cementation of a three-tooth fixed prosthesis (Fig. 9).

A 7-year follow-up radiograph (Fig. 10) shows satisfactory preserva-
tion of bone surrounding all of the implants. An intraradial picture of the definitive prosthesis shows healthy gingival tissue (Fig. 10).

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Figure 19. Panoramic radiograph of the abutments seated on the bicuspids. Because the restoration is fully implant-
supported, gradual diminishment of the residual ridge will not pose a problem for the patient.

Figure 20. Completed bridge in place showing flange length suit-
able to prevent food.