Annals of Clinical and Medical Case Reports[R] ISSN 2639-8109 | Volume 15

Case Report Open Access

Intraoral Welding Technique in Oral Implants

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Received: 08 Aug 2025
Accepted: 29 Aug 2025
Published: 09 Sep 2025
J Short Name: ACMCR

Citation:

Bernhardt German, Intraoral Welding Technique in Oral Implants. Ann Clin Med Case Rep® 2025; V15(1): 1-3

1. Introduction

Rigid temporization has been recognized to have a significant impact on the peri-implant tissue response in immediate implant loading since it reduces the mechanical stress exerted on each implant. Intraoral welding (also known as syncrystallization or oral welding) is an advanced technique used in implant dentistry to join titanium implant components directly inside the patient's mouth. It creates a rigid, unified framework immediately after implant placement, offering immediate stabilization and prosthesis support. The syncrystallization technique allows an expedite and adequate rigid splinting of multiple immediately loaded implants.

The advantages of the technique are:

(1) reduction of treatment time for immediate temporization at stage 1 surgery;

(2) predictable fixation and immobility of implants in the early stages of bone healing; and

(3) less time for repairing provisional restorations as a result of no or rare fracture.

What Is Intraoral Welding?

Intraoral welding is a low-voltage electric resistance welding process that fuses titanium components (usually abutments, bars, or rods) together inside the oral cavity. It's mainly used to create a rigid splint connecting multiple implants during immediate loading protocols-especially in full-arch restorations.

2. Key Principles

- Material: Only titanium and titanium-alloy components can be welded this way.
- Welding Unit: A specialized intraoral welder is used, such as:
- Mondani intraoral welder
- Syncrystallizer
- Electrical Arc: A controlled electric arc briefly melts the titanium surfaces, which fuse together upon cooling.
- Shielding: The process is quick and causes minimal tissue heating. No inert gas shielding is required, unlike traditional welding.

Steps in the Intraoral Welding Technique

- Implant Placement:
- Multiple implants (usually 4–6) are placed in the arch.
- Placement of Titanium Abutments or Cylinders:
- Abutments are torqued onto implants.
- Titanium Bar or Rod Adaptation:
- A titanium bar is bent and adapted to connect all abutments.
- Intraoral Welding:
- Using the welding device, the titanium rod is fused to the abutments intraorally.
- Prosthesis Connection:
- A provisional prosthesis is connected to the welded framework.

3. Benefits of Intraoral Welding

- Immediate rigid splinting of implants
- Minimizes implant micromovement → improved osseointegration
- Supports immediate function and loading
- Reduces need for impressions or lab procedures for temporary prosthesis
- Useful in compromised bone cases

4. Limitations & Considerations

- Requires specialized equipment and training
- Welding must be precise to avoid:
  - Thermal damage to tissues
  - Weak joints if technique is poor
- Not suitable with non-titanium components
- Still considered an adjunctive technique, not mainstream in all regions

5. Evidence & Research

- Studies show comparable success rates with intraoral welding versus traditional methods for immediate loading.
- Proven effective in full-arch rehabilitations and edentulous jaws.
- Often used in Italy, Argentina, Brazil, and select European countries, but less common in the US due to equipment and technique adoption rates.

6. Related Concepts

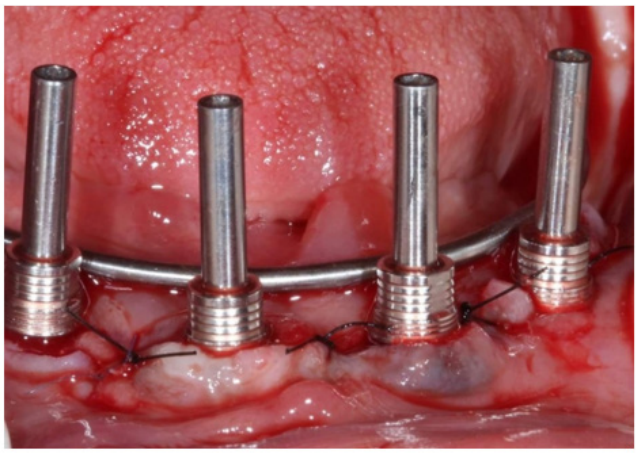
- Syncrystallization: Another term used interchangeably.
- Chairside welding: Similar concept, sometimes refers to ex vivo welding adjacent to the chairside.
- CAD/CAM prosthetics: Often used in tandem with intraoral welding in advanced full-arch cases.

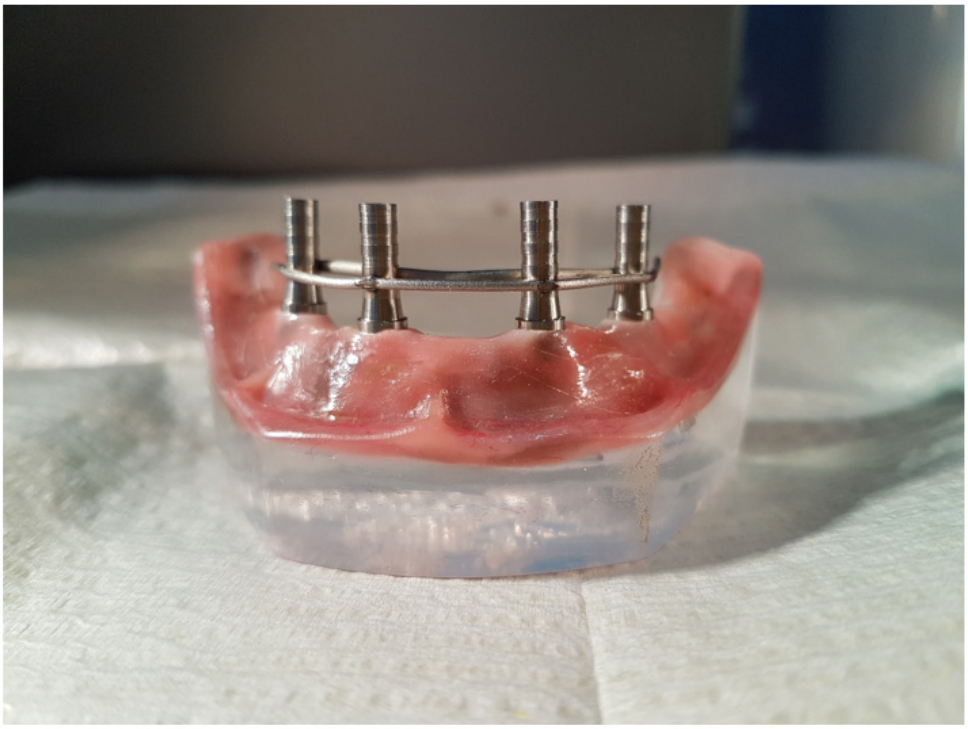
7. Results

The intraoral welding technique allows a simple surgical procedure, with a minimal number of steps, which enables an improvement in osseointegration, reducing healing time and better psychological perception by the patient. It is possible to return aesthetic function and oral function to the patient immediately.

8. Conclusion

Immediate implants are very predictable and have an excellent success rate. Intraoral electrowelding technique is a valid, effective and reliable method for rehabilitation, and must be performed by a trained professional. Using the intraoral welding technique, it is possible to establish significant primary stability from the first moment and offer the patient the possibility of immediate post-surgical rehabilitation in a stable, aesthetic way, in occlusion and with retention.



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