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Case Report

# Key to Success in Full Arch Rehabilitation Procedures with Immediate Loading - A Case Report

**Jean-Fabien Grangeon***

*Head of Department of Oral Implantology, Clinique Dentaire Des Mascareignes, Private Practice, Reunion Island, French Overseas Territories*

***Corresponding Author:** Jean-Fabien Grangeon, Head of Department of Oral Implantology, Clinique Dentaire Des Mascareignes, Private Practice, Reunion Island, French Overseas Territories.

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## Abstract

The full dental arch rehabilitation procedures, with extraction, Immediate Implant positioning and Immediate loading, are sometimes the right solutions for patients in terms of perennity, speed of implementation, esthetic and functional requirements.

This article aims to establish a, non-exhaustive but yet essentiel, list of parameters, supported by unanimously accepted scientific evidences, in order to secure and repeat successfully these kind of quite heavy and delicate procedures.

**Keywords:** Implantology, Immediate Loading; Full Dental Arch Reconstruction; Bone Grafting; Sticky Bone; A-PRF; L-PRF; S-PRF; Papilla Reconstruction; Tissue Integration; Esthetic Procedures; Apical Mattress Sutures; Subcrestal Shoulder Surgery; Subcrestal Implant Positioning; Platform Switching; Conical Implant/Abutment Interface

## Abbreviations

PRF: Platelet Rich Fibrin; A-PRF: Advance - Platelet Rich Fibrin; S-PRF: Strong - Platelet Rich Fibrin; I-PRF: Injectable – Platelet Rich Fibrin; IL: Immediate Loading; ST: Sticky Bone

## Introduction

The patient, a 50-years old woman, came to our clinic to find a fixed prosthetic solution to replace her missing teeth, and finally regained the smile she dreamed of but never had the chance to have. The social conditions in her childhood, the poor access to dental hygiene knowledge were the main reasons of the deterioration of her buccal health.

However, she has had success in her social and work life and has been able to access to that type of cost demanding treatment.

## Materials and Methods

After the first examination, intra oral probing, panoramic X-ray and Cone Beam Computed Tomography (CBCT), we've exposed the following treatment plan.

### Initial periodontal treatment:

- Oral health sensibilization and education of the proper technics for maintenance.
- Full mouth scaling, surfacing, use of airflow with special powder for sub-gingival procedures.
- Re-evaluation at 15 days post gum treatment.

### Then, in a single appointment, under conscious sedation:

- Extraction of the residual maxillary teeth
- Scrupulous revision of the alveolar process and sockets, removal of all the cystys, inflammatory tissues, infiltrated periosteum…
- Implant placement of 8 implants from tooth #14 till #24, parallelized to the anterior palatal foramen emergence and axis.
- Specific shape of implant
- Specific sub-crestal positioning of implant

- Specific conical-connection between implant and abutment
- Specific, straight, non angulated, conical and switching platform abutment of 3mm Gum's Height, ( 30 N.cm torque), which will never be removed to preserve the connection between gum and abutment.
- Immediate placement of the impression copings on the abutment.
- Large buccal Bone graft using a human Allograft from a bone bank, melted with A-PRF liquid for rehydration of the bone particulates, allowing us to make a Sticky Bone, compact, easy to manage and shape.
- Protection of the bone graft by A-PRF membranes.
- Gingival sutures such as apical-mattress sutures and suspended double papilla sutures, after gentle brushing of the periosteum, to release the tension and allow closure of the wounds without periosteal incision or tissue tension.
- Link and contention of the impression copings with hard and fast set resin.
- Impression of the situation
- Placement of protection covers on the abutments
- Occlusion settings and registration.

### 48 hours, post intervention:

- Remove of the protection covers from the abutments.
- Placement of a provisional, screw- retained, fixed and rigid bridge on the abutments.
- Occlusion checkings and finishings.
- Closure of the palatal holes for the screw with a temporary resin over a thin layer of teflon (to protect the screws).

At 6 months post intervention, the patient is back at the office, previously informed of his social unavailability for 4 hours.

- Removal on the temporary resin and teflon.
- Removal of the screws and replacement of this shirt screws by long ones, in order to take impression of the bridge in its situation.
- Placement of the covers on the abutments.
- Recordings of all the settings at the lab
- Placement of the provisional restauration back from the Lab, 4 hours max after impression.

10 days Later, we can finally place the definitive zircone- ceramic screw retained bridge.

## Results and Discussion

**Figure 1:** Situation before treatment.

**Figure 2:** Partial denture over decayed root.

Implant placement after teeth extraction (45- 60 N.cm Torque). Immediate placement of the abutment (30 N.cm torque), covered by the pick up impression copings.

The implants are positioned as parallel as possible. placement in the palatal aspect of the jaw allows:

- Primary stabilisation in native bone
- Space for bone graft in the buccal aspect.
- A palatal emergence of the screws in the prosthetic bridge

**Figure 3**

Large Bone grafting " sticky bone" made of allogenic bone particles re-hydrated and coagulated with the A-PRF liquide. the graft is then covered by A-PRF Membranes.

**Figure 4**

**Figure 5:** Placement of cover caps on the abutments after pick-up teknic impression.

**Figure 6**

**Figure 7:** Gum healing at 48 hours post op.

**Figure 8**

**Figure 9**

**Figure 10**

**Figure 11**

**Figure 12**

We can appreciate the maturation of the tissus and the improvement of the esthetical reconstruction along that follow up.

However, such results can be achieved only with the combination of many factors that enhances our chances of success.

The shape and design of the implant allowing primary stability in post-extractional implantation is determinant as well as the implant positioning, [1] 2 to 3 mm under the bone level, regarding the respect of vascularisation and the repartition of the forces [2].

The design of the internal and conical conexion (sealed conexion) between implant and abutment [3] is also documented and seems to promote the stability of peri implant tissues minimizing the bacterial percolation at the interface implant / abutment.

The choice of the straight conical abutment of 3mm height respects Tarnow's principles of papillary reconstruction [4,5]. and the platform switching [6]. allows to control the diameter of the emergence profile of the prosthetic tooth, no matter the diameter of the implant.

The addition of liquid A-PRF to allogenic bone particles allows us to create a fabulous bone graft called “Sticky Bone”, very easy to use and fill in the gaps.

But among that, the use of PRF [7] has many advantages.

1. Anti inflammatory action [8-10]: “PRF holds an anti-inflammatory activity and shifts the macrophage polarization from an M1 towards an M2 phenotype”.
2. Angiogenesis stimulation [11] by secreting many Growth factors (150 +/-) such as BMP, VEGF, IGF, TGF…
3. Pain Killer Action [12].
4. Anti Infectious action [13], - by limiting bacterial growth, suppressing dissemination of microbes to distant sites, and mediating host bacterial killing.

The sutures after a soft brushing of the periosteum (to avoid any bleeding and post operative injuries) are determinant as well in the success of these procedures.

In order to eliminate all the stress on the gum around the implants, apical mattress sutures are used to stabilise the flaps at the apical point of the graft, allowing tension free sutures around the cover caps. We are very careful not to create compression / tension on the bone or gum to avoid ischemia harmful to healing.

Finally, the lab work which will deliver us a provisional bridge with rigid and passive infrastructures will assure us the osseointegration of the implants.

After healing of the tissues, at 6 months post operation, we’ll finally place the definitive screw retained Zirconia-ceramic bridge.

## Conclusion

If certain technical or biological points seem to win the support of the majority, we wish, like more and more numerous authors, to put the patient at the heart of the debate today.

We believe that monitoring the health of the patient before the treatment [14] through the results of simple blood tests, can allow us to better analyze the chances of success, and how to supplement those who are deficient in order to obtain more predictable results

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