

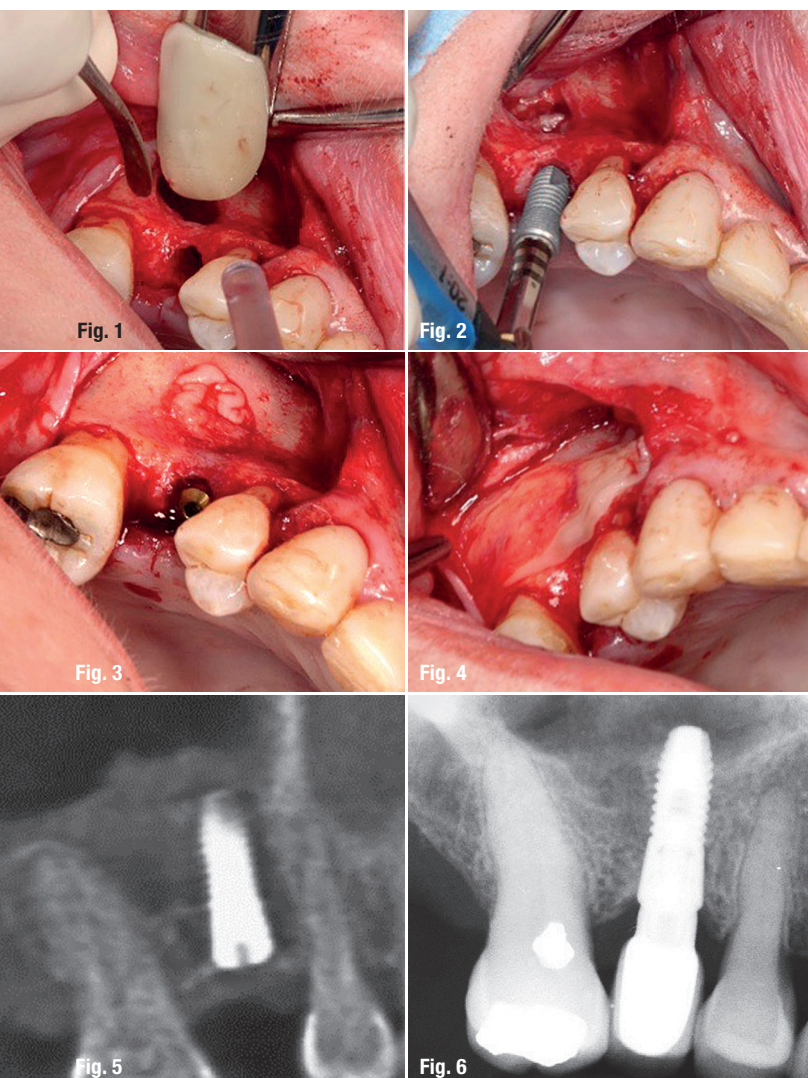
L-PRF in different intraoral applications

Part III: L-PRF in sinus floor elevation

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Approach 1: Lateral window technique – **Fig. 1:** After careful preparation of the osteotomy, L-PRF membranes are placed to cover the Schneiderian membrane (at least three layers). **Fig. 2:** Implant placement. **Fig. 3:** Additional L-PRF membranes are placed around the implant. **Fig. 4:** The window is covered with L-PRF membranes (at least two layers). **Fig. 5:** CBCT scan immediately after surgery. **Fig. 6:** Radiograph after one year.

Leukocyte- and platelet-rich fibrin (L-PRF) accelerates wound healing in both soft and hard tissue significantly. Major indications for the use of L-PRF and the step-by-step preparation of L-PRF clots, membranes and plugs, as well as application approaches to open-flap debridement and ridge preservation, were introduced in the first two parts of this article series. In this third part of the series, two treatment approaches to sinus floor elevation will be presented. The first option is the application of the lateral window technique and the use of L-PRF as grafting material. The second approach described below is the transalveolar technique, an alternative to the lateral window technique.

Lateral window technique

The lateral window technique is a minimally invasive approach to surgical access. The clinical procedure provides lateral access to the maxillary sinus with a minimally invasive osteotomy. An incision of relatively small dimensions is made with regular lines to delimit a rectangular shape, and convergent incisions in the cavity direction, resulting in a true chamfer. This surgical approach creates sinus access by detaching the Schneiderian membrane from the sinus floor and placing bone grafting materials into the sinus cavity in order to promote bone augmentation. Local infiltrative anaesthesia in the buccal and palatal regions of the surgical area is administered prior to the surgical procedure. The technique is considered quite successful, even with the use of different types of grafting materials and implants.

Step-by-step approach to sinus floor elevation via the lateral window technique

Elevation of the sinus floor was achieved in the case demonstrated by employing the lateral window technique. The implant was placed simultaneously using L-PRF as sole grafting material.

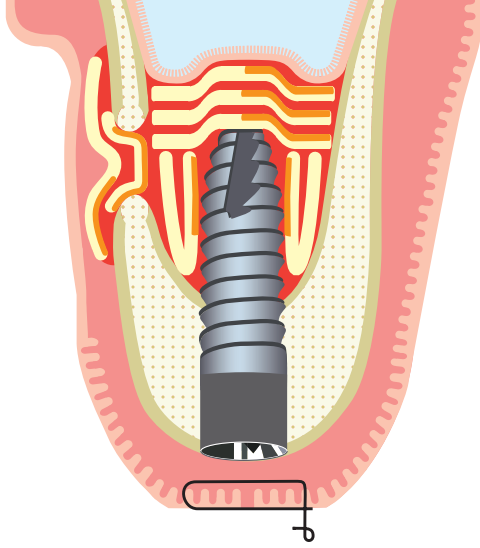


Fig. 7: Final situation after surgery using the lateral window approach with immediate implant placement using L-PRF. At the end of the procedure, the window is sealed with at least two layers of L-PRF membranes.

- Closure of the flap without moving the L-PRF membranes.
- Suture with a monofilament, non-re-sorbable thread (Fig. 5).

Postoperative care

- Flying, diving or using wind instruments is forbidden for at least six weeks.
- Forceful sneezing should be prevented for at least six weeks.
- Sufficient painkillers, systemic antibiotics, a nose spray and corticosteroids (the last for three days, for example) should be prescribed if needed.
- After four to six months of healing, the abutment can be placed and loaded if the implant has integrated well.
- A control radiograph should be taken at the one-year check-up (Figs. 6 & 7).

Transalveolar technique

The transalveolar approach to sinus floor elevation can be chosen for the subsequent placement of dental implants. This approach to sinus floor elevation is considered less invasive than the lateral window technique. It can be employed in the case of reduced residual bone height (of more than 4mm) in a patient that does not allow for the conventional placement of implants. After the treatment, patients are often advised to take antibiotics, when grafting materials were used, and to perform antiseptic rinses in order to prevent perforation of the Schneiderian membrane or possible postoperative infections. Successful treatment outcomes of the transalveolar technique have been reported with and without the use of grafting materials.

Step-by-step approach to sinus floor elevation via the transalveolar technique

Elevation of the sinus floor was achieved in the case demonstrated by employing the transalveolar technique. The implant was placed simultaneously using L-PRF as sole grafting material.

Protocol for the lateral window technique

- Crestal incision and one or two optional releasing incisions.
- Folding back of the full-thickness apically and distally and far enough to have a clear view.
- Preparation of the lateral window using piezo-ultrasonic instruments or a ball drill. Prior to that, a CBCT scan should be taken in order to check for potential arteries in the lateral sinus wall.
- Meticulous elevation of the Schneiderian membrane. The bony window can either be pushed inside, avoiding sharp edges, or be removed.
- Once the membrane has been elevated, the osteotomy site can be prepared.
- After careful preparation of the osteotomy, but before implant placement, L-PRF membranes are placed covering the Schneiderian membrane and the area which is to be augmented (especially palatally), since this entire area is quite difficult to reach after the implant has been inserted (Fig. 1). At least three layers of L-PRF (preferably two double-folded layers) must cover the Schneiderian membrane in the area where the apex of the prospective implant will be located.
- Placement of several L-PRF membranes against the palatal/mesial/distal walls of the uncovered sinus.
- Implant insertion (Fig. 2).
- Application of further L-PRF membranes around the implant in the sinus and buccally (Fig. 3), so that the space between the implant and the bony walls of the augmented sinus is filled with membranes, often more than three.
- Sealing of the window using at least two layers of L-PRF membranes (these should be facing towards the sinus; Fig. 4).



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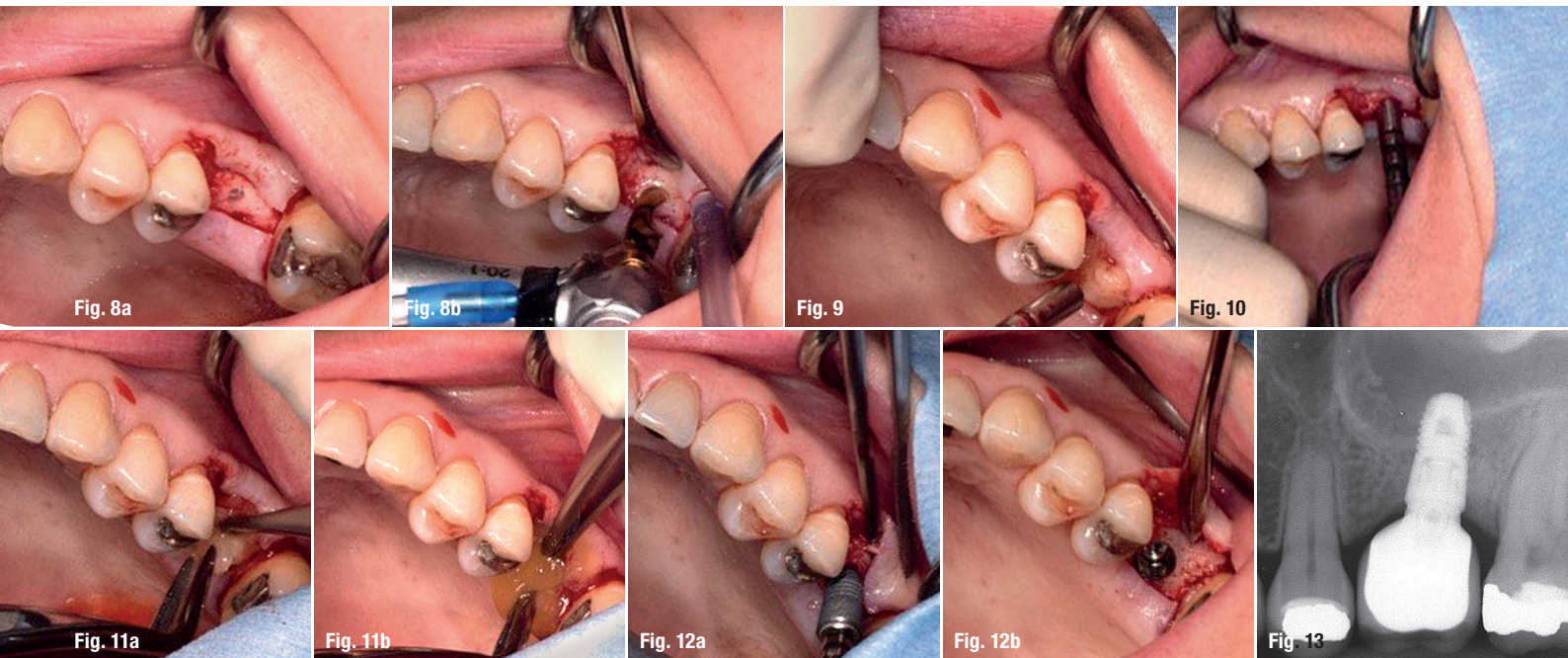
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Approach 2: Transalveolar technique – Figs. 8a & b: Osteotomy preparation at a distance of up to 1 mm from the Schneiderian membrane. **Fig. 9:** Placement of one L-PRF membrane into the osteotomy site as a cushion for the osteotomes. **Fig. 10:** Fracturing of the remaining sinus floor with osteotomes. **Figs. 11a & b:** Elevation of the Schneiderian membrane by inserting several (four or more) L-PRF membranes. **Figs. 12a & b:** Implant placement. **Fig. 13:** Radiograph after one year. **Fig. 14:** Final situation after surgery using the trans-alveolar approach to sinus augmentation. Several L-PRF membranes separate the Schneiderian membrane from the apex of the implant and fill the space between the implant and the augmented sinus.

Protocol for the transalveolar technique

- Crestal incision and one or two optional releasing incisions.
- Folding back of the full-thickness flap in order for the crestal bone to be exposed.
- Osteotomy site preparation at a distance of up to 1 mm from the Schneiderian membrane (different techniques can be applied; Figs. 8a & b).
- Placement of one L-PRF membrane into the osteotomy site, which then acts as a cushion for the osteotomes used in the next step (Fig. 9).
- Careful fracturing of the remaining sinus floor with osteotomes (Fig. 10).
- Elevation of the Schneiderian membrane by carefully inserting several L-PRF membranes (one at the time) into the sinus via osteotomy with the use of osteotomes. At least four L-PRF membranes should be placed into the sinus (Figs. 11a & b), since generally at least four membranes are needed for one implant.
- Implant insertion (Figs. 12a & b).
- Suturing with a monofilament non-resorbable thread.

Postoperative care

- Flying, diving or using wind instruments is forbidden for at least six weeks.
- Forceful sneezing should be prevented for at least six weeks.

- Sufficient painkillers, systemic antibiotics, a nose spray and corticosteroids (the last for three days, for example) should be prescribed if needed.
- After four to six months of healing, the abutment can be placed and loaded if the implant has integrated well.
- A control radiograph should be taken at the one-year check-up (Figs. 13 & 14).

Editorial note: The fourth and last part of this article will be published soon. It will cover application approaches to implant coating with L-PRF, gingival recession coverage and the preparation of L-PRF blocks.

contact

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