Platelet-Rich Fibrin in *Caldwell-Luc* procedure - A Literature Review and Clinical Case presentation

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Abstract

In bone graft, implant and reconstructive surgery, the literature is particularly dense about the use of the various forms of Platelet Rich Plasma (PRP), but still limited about Platelet Rich Fibrin (PRF) subfamilies.

One key question that remains is to define the best filling material for the subsinus cavity after lifting the sinus membrane. The consensual approach is to consider that most materials are efficient for this surgery, considering the high osteogenic potential of the Schneiderian membrane and its periosteum-like behavior. However, the choice of material or association of materials will influence the waiting period before adequate healing and remodeling of the grafted material, implant placement, and functional loading.

We describe and discuss the current published knowledge about the use of L-PRF during the sinus lift procedure with implant placement.

We also present a clinical case illustrating the practical application of the above mentioned technique.

Background and Aim

Among the great challenges facing clinical research is the development of bioactive surgical additives regulating inflammation and increasing healing. The use of platelet concentrates during surgical procedures like sinus lift is a current treatment concept used to accelerate wound healing.

L-PRF, that results from a natural fibrin polymerization process, incorporates more circulating cytokines, predisposes cell migration and improves osteogenic and osteoinduction process.

L-PRF membranes alone are able to protect the sinus graft area. This point is very interesting, because PRF is an inexpensive autologous biomaterial with a significant slow release of growth factors and could easily replace xenogeneic and expensive collagen membranes in this application.

The aim was to collect recent scientific evidence about the advantages of just using PRF in sinus lift procedures with simultaneous implant placement.

Methods and Materials

Dental literature was searched with Pubmed for (sinus lift OR Caldwell-Luc) AND (platelet rich fibrin OR PRF) AND implant. 14 articles were obtained. The following limits were selected: meta-analysis, multicenter study, randomized controlled trial, review and systematic review, resulting in 3 articles.

CASE PRESENTATION:

Extraction of the impacted third molar

Caldwell-Luc approach and Summers osteotomes to maximize autologous bone recovery

Sinus filled with L-PRF membranes and implant placement (10 mm length, Ø 4.7 mm with a SBM surface, Legacy 2 Implant Direct™)

Extraction site filled with L-PRF and access window sealed with resorbable collagen membrane

Surgical site with resorbable collagen membrane and wound closure with 4/0 polyamide suture

Surgery performed by David Alfaiate

Results

Five months after surgery, the implant was clinically stable during abutment tightening. The final level of the new sinus floor was in continuation with the implant apical end, and the periimplant crestal bone height was stable.

CBCT image showing implant osseointegration with the elevated sinus floor

Immediate post operation OPG

5 months post operation OPG with healing abutment

Conclusions

Lack of adequate bone and proximity to anatomic structures are amongst the most common encountered problems at the implantation site. The use of L-PRF as sole filling material during simultaneous sinus-lift and implantation seems to be a reliable surgical option promoting natural bone regeneration.

In the case presented the L-PRF as a sole filling material for sinus lift with simultaneous implant placement proved to be effective.

References

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