L-PRF in different intraoral applications

Part I: Preparation of L-PRF

Prof. Nelson R. Pinto[1], Dr Andy Temmerman[2], Ana B. Castro[2], Simone Cortellini[2], Prof. Dr Wim Teughels[2] & Prof. Dr Marc Quirynen[2]

[1] Department of Periodontology and Oral Implantology, Faculty of Dentistry, Universidad de Los Andes, Santiago, Chile
[2] Department of Oral Health Sciences, Section of Periodontology, KU Leuven & Dentistry, University Hospitals, KU Leuven, Leuven, Belgium

Favourable wound healing has always been a major quest in dental surgery. It is a concern in healthy as well as compromised patients. In an effort to improve and accelerate healing of both hard- and soft-tissues, substitutes including growth factors and biomaterials have been traditionally employed. Membranes were also introduced to separate tissues.

Recent research clearly indicates that L-PRF (leukocyte- and platelet-rich fibrin, a second generation of platelet concentrates) significantly enhances wound healing in both soft- and hard-tissues. Evidence now supports the assertion that this has the potential to replace the above mentioned substitutes in many situations.

Clinical procedures benefit from recent advancements with platelet concentrate protocols including, but not limited to: soft tissue healing, plastic periodontal surgery, gingiva enlargement, MRONJ, regeneration of infra-bony defects, ridge preservation, sinus augmentation, immediate implant placement and implant osseointegration itself.

An added benefit is that these platelet concentrate protocols offer significantly lower cost treatment solutions to our patients, due to the fact of their ease of use and inexpensive preparation.

Major indications for the use of L-PRF are

- Implant coating
- Wound healing
- Ridge preservation
- Immediate implant
- Floating implant
- Soft tissue R
- MRONJ
- Sinus R
- Infra-bony R

Major indications

Our basic knowledge of the biologic mechanisms of both soft- and hard-tissue healing has increased exponen-

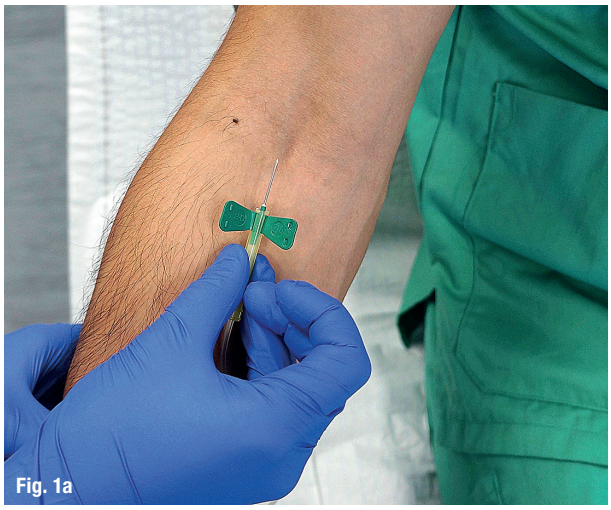
Fig. 1a

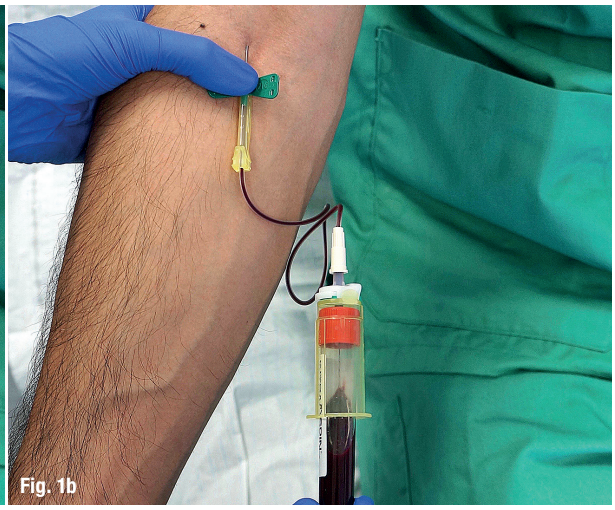
Fig. 1b

Figs. 1a & b: Venipuncture and blood collection using 21 G butterfly needle and 9 ml red cap tubes.

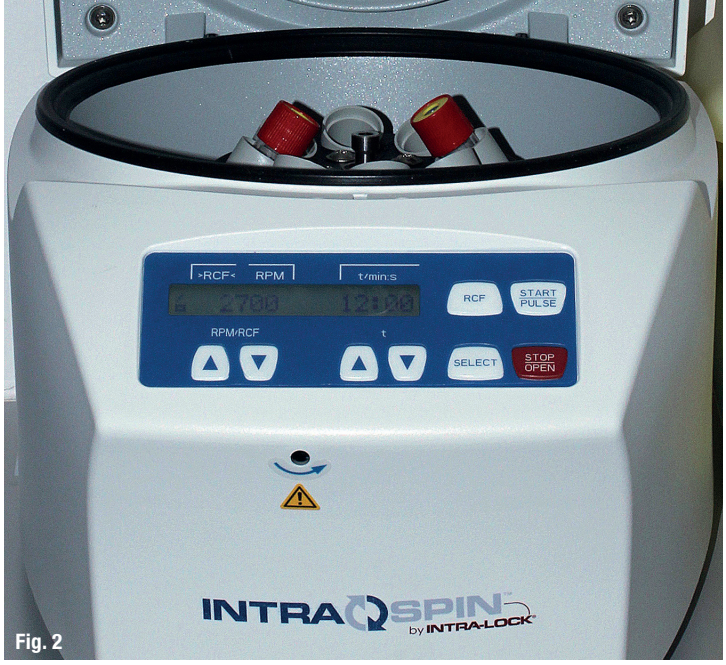

Fig. 2

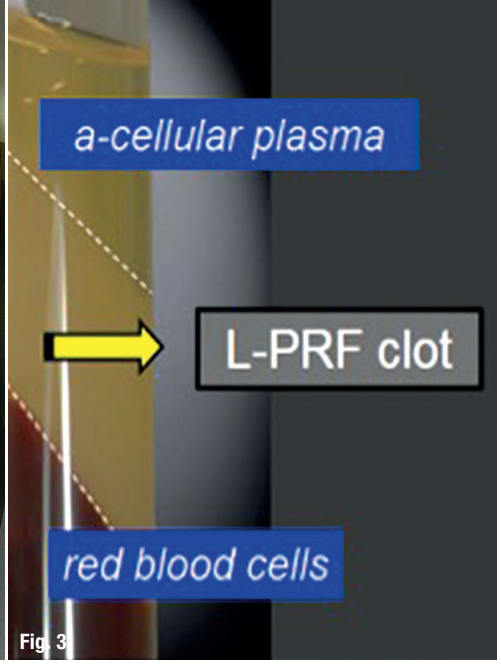

Fig. 3

Fig. 2: Centrifugation at 408 g RCF, (2,700 rpm) with IntraSpin™ centrifuge. **Fig. 3:** L-PRF clot in tube; clear separation: red blood corpuscles (RBCs) at the bottom, PPP (platelet-poor plasma) on the top, and L-PRF fibrin clot in the middle.

tially in recent years. Advancements in autologous platelet concentrate protocols, profoundly impact the way we treat patients today.

Thanks to these advancements we can now introduce a new level of treatment options to our daily practice, from periodontal procedures to regeneration of bone defects and even implant osseointegration itself.

Step by step approach for the preparation of L-PRF

Protocol for preparation of L-PRF clots

- Venipuncture: With a 21 G butterfly needle collect up to eight 9 ml red cap tubes of blood (Figs. 1a & b).
- After the first two tubes of blood are collected, immediately place them into the IntraSpin™ centrifuge,

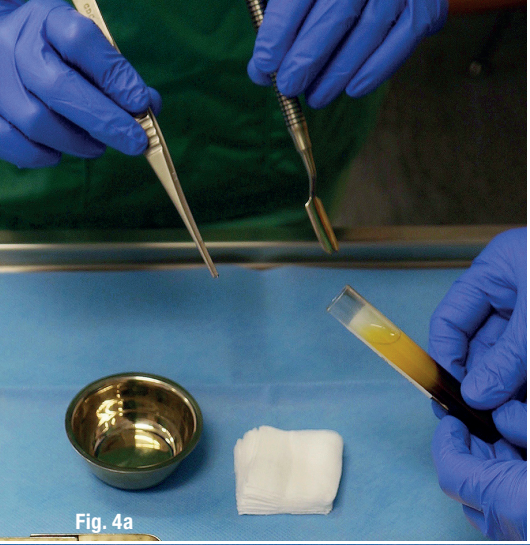
Fig. 4a

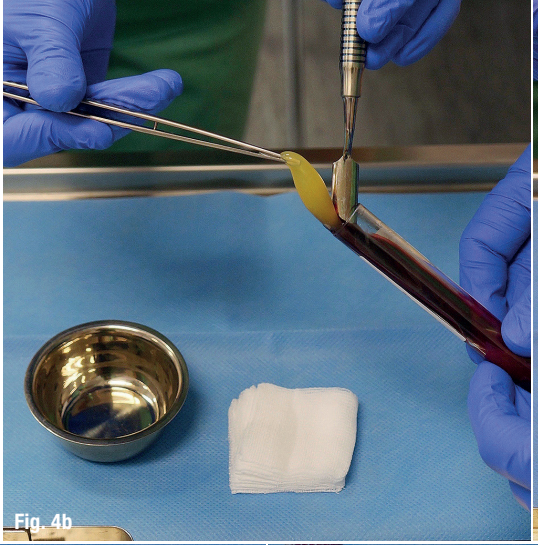
Fig. 4b

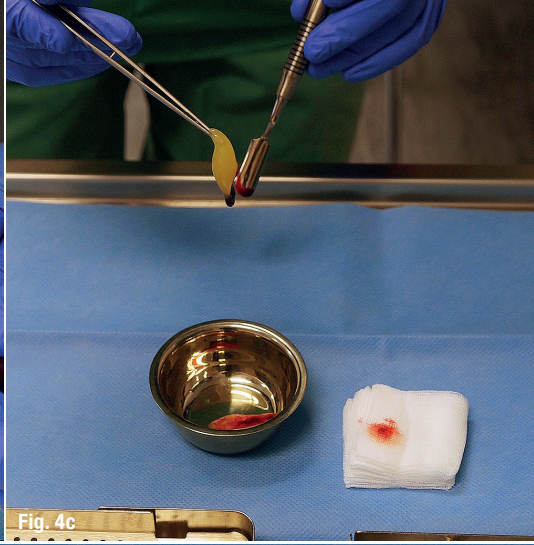
Fig. 4c

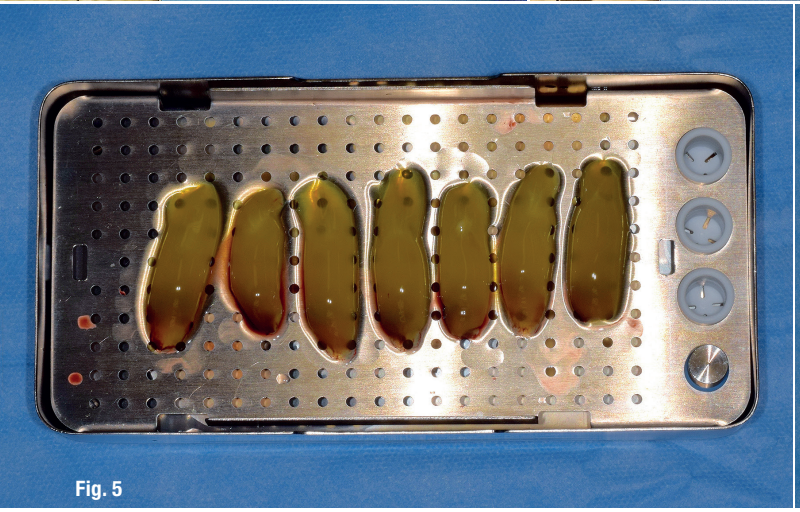
Fig. 5

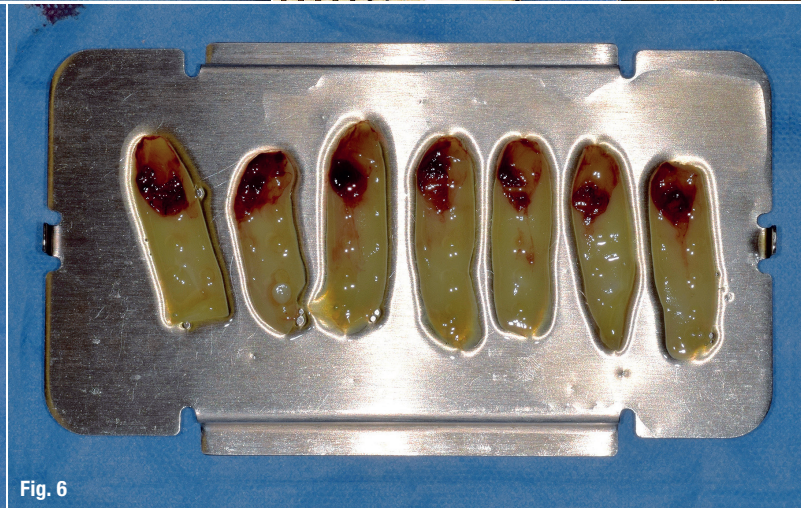
Fig. 6

Figs. 4a–c: Remove clot from tube and separate clot from red blood cells. **Fig. 5:** Specially designed kit (Xpression™ box) to compress L-PRF clots into L-PRF membranes with a consistent thickness of 1 mm. A piston and cylinder assembly (right) can be used for the creation of L-PRF plugs, suitable for filling extraction sockets. **Fig. 6:** L-PRF membranes after gentle compression: the red area of the membrane represents the face side where most leucocytes, platelets and stem cells are concentrated.

opposite to each other to ensure the centrifuge is properly balanced. Close the cover and set the timer to one minute. Press START and allow the centrifuge to run for one minute, it will then come to a full stop and the cover will pop open. While it is spinning for one minute collect the third and fourth tube of blood from patient, and repeat the procedure for the other tubes.

- Centrifugation should be at 408 g (2,700 rpm using the IntraSpin™ centrifuge, for at least 12 minutes (start timing after loading the centrifuge with the last two tubes, Fig. 2).
- After 12 minutes of centrifugation (for patient taking anti-coagulant medication up to 18 minutes are recommended) L-PRF clots are ready (Fig. 3).
- Take the fibrin clots out of the tubes and separate them from the red blood cells (Figs. 4a–c).

Protocol for preparation of L-PRF membranes

- Place fibrin clots in Xpression™ box for gentle compression by gravity (e.g. with light metal plate, Fig. 5).
- Five minutes later the L-PRF membranes are ready for use (Fig. 6).
- The viability for expressed membranes is 2.5 to 3 hours, as long as they are re-hydrated with exudate.

Protocol for preparation of L-PRF plugs

- Place fibrin clots in the small white cylinder of the Xpression™ box.
- Use the piston to carefully compress the clot, until holder is level to cylinder.
- The viability for expressed plugs is 2.5 to 3 hours, as long as they are re-hydrated with exudate.

Editorial note: To be continued in implants 2/18 with application approaches for open flap debridement and ridge preservation.

For further information visit: www.ENHD2018.be

contact

Prof. Dr Marc Quirynen
University Hospitals Leuven
Periodontology & Oral Microbiology
Kapucijnenvoer 7 blok a – box 7001
3000 Leuven, Belgium
Tel.: +32 163 32483
marc.quirynen@kuleuven.be

Author details

Shortest Implants – Longest History.

Think Short!

For more than 30 years Bicon® short implants are unchanged in clinical use. Recent scientific studies confirm clinical efficacy and show the profits to local bone in many cases.

According to the 11th European Consensus Conference (EuCC) 2016 in Cologne, provided the specific treatment parameters are observed, the use of short, angulated or diameter-reduced implants in sites with reduced bone volume can be a reliable treatment option, given the risks associated with the use of standard-dimension implants in combination with augmentation procedures.

More information:
Bicon Europe Ltd.
Dietrichshöhe 2, 55491 Büchenbeuren, Germany
Phone +49 (0)6543 818200, germany@bicon.com
www.bicon.de.com

SINCE 1985 SHORT® IMPLANTS

bicon® DENTAL IMPLANTS

Popular sizes: 3x6, 3x8, 3,5x8, 4x5, 4x6, 4x8, 4x11, 4,5x6, 4,5x8, 5x5, 5x6, 5x8, 6x5, 6x6, 6x8 mm