

Surgical Commentary

Preparing platelet-rich plasma by syringe technique: A simple, sterilized and cost-effective outdoor procedure

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Over the past decade, platelet-rich plasma (PRP) has rapidly gained its place in many disciplines of the medicine. Recently, it has also made its place in the dermatology especially the cosmetic dermatology. Currently, several techniques to prepare PRP are available. There are controversies in the literature regarding the potential benefits of PRP, due partly to the lack of optimized and standardized preparation protocols. Commercial kits are easy to use and usually give consistent results but they are expensive. On the other hand, manual method by pipetting, is cumbersome with difficult sterilization although it is cheap. We describe Syringe Technique a simple, sterilized and yet cost-effective method for making platelet rich plasma.

Platelet-rich plasma (PRP) is defined as plasma containing platelet level above peripheral blood concentration.^{1,2} Platelets store growth factors including platelet-derived growth factor, transforming growth factor- β , platelet-derived epidermal growth factor, vascular endothelial growth factor, insulin-like growth factor-1, fibroblastic growth factor, and epidermal growth factor, cytokines and many other proteins.³ Therefore, increasing platelet concentration in a

damaged tissue would result in increased levels of these growth factors and, subsequent, improvement in healing process.⁴

Its applicability includes plastic surgery,¹ orthopedic surgery,³ cardiac surgery, ophthalmology, and sports medicine.⁵ There are differences in the concentration of platelets prepared by the various automated and manual techniques described in the literature⁶ and this can affect the different biological effects. The preparation of PRP by syringe technique is introduced for the first time using common laboratory ware and equipment. This would contribute to the establishment of a reliable and practical method. It is an outdoor office procedure, less time consuming and not labor some. It is also cost-effective and convenient for the patient. It saves patients time and readily applicable.

Methodology

- It is an office procedure that involves a blood draw followed by preparation of PRP in the injectable form.
- Firstly 9ml of blood is drawn aseptically from the vein of the patient in a 10ml syringe containing 1ml sodium citrate (sodium citrate can be obtained from the blood bag).
- The plunger and finger holders of the syringe are then cut by the bone cutter /large scissors/prune cutting scissors as shown in the **Figure 1**.

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Figure 1 Plunger and finger holders of the syringes are cut which allows syringes to be placed in centrifuge machine directly. Picture showing plasma, buffy coat and red cells concentrate after first centrifugation.



Figure 2 First assistant pushes plasma and buffy coat with the help of forceps while another assistant is

- After removing the needle the syringe is placed in centrifuge in an upright position
- First soft centrifugation is done at 250G (1500RPM with 10cm radius of centrifuge) for 15 minutes.
- After first centrifugation whole plasma along with buffy coat is drawn in another syringe as

shown in **Figure 2** and again centrifuged at 1295G (3400 RPM with 10 cm of radius of centrifuge) for 15 minutes

- After second centrifugation upper two third of PRP is discarded and lower one third – platelet-rich plasma is shaken for 1 min and can be used as such or after activation with either calcium chloride or calcium gluconate.

Adhere to the following guidelines as per recommended by American Academy of Orthopedic surgeons:

- a) Avoid corticosteroids for 2-3 weeks prior to the procedure
- b) Stop taking aspirin, NSAIDs and COX2 inhibitors
- c) Drink plenty of water/ fluids the day before the procedure.⁷

References

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