

**Evaluation of the Effect of Autologous Platelet  
Rich Fibrin Matrix on Osseointegration of the  
Titanium Implant  
Radiographical & Immunohistochemical Studies  
in Rats**

A Thesis

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# Abstract

**Background:** Platelet-rich fibrin (PRF) is a simple, low cost and minimally invasive way to obtain a natural concentration of autologous growth factors and is currently being widely experimented in different fields of medicine for its ability to aid the regeneration of tissue with a low healing potential. Fields of application are sports medicine, orthopedics, dentistry, dermatology, ophthalmology, plastic and maxillofacial surgery, etc. The rationale for using platelets in so many fields for the treatment of different tissues is because PLTs constitute a reservoir of critical GFs and cytokines, which may govern and regulate the tissue healing process that is quite similar in all kinds of tissues.

**Materials and Methods:** Screw titanium implants inserted in the femurs of the thirty two adult rats. The right side is considered as experimental groups and the left side considered as control groups. Autologous platelet rich fibrin matrix applied with the right screw implants. The sample divided into four groups, eight rats are sacrificed at four interval 3days, 7days, 2weeks, and 6weeks respectively. Histological, immunohistochemical (PDGF-A&IGF-1), and radiographical evaluation were done for each interval.

**Results:** Histological examination showed that the acceleration of bone formation and more rapid healing process in the screw implant with PRFM than in the control implant. Radiographical examinations showed that the process of osseointegration started after 2weeks and complete radioopacity around the titanium implant after 6weeks. Immunohistochemical findings revealed high positive expression for IGF and PDGF in experimental implant in comparison to control one.

**Conclusion:** This study was illustrated that PRFM material was osseoinductive material that enhances the osseointegration process in titanium implant site in comparison to the normal physiological healing process.

The results show a positive effect of PRFM and it can be suggested for beneficial use in the practice of dentistry implantation, periodontics, oral surgery since it enhance osseointegration, reduce the period of patient suffering and the incidence of post implant complications.