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Narrative report for “Autologous Fibrin Matrix for Growth Factor Delivery”

A major milestone reached from this project has been the collection of human serum samples from a large cohort of dental patients. To date, we have samples from 120 subjects spanning diverse age, systemic conditions, and dental conditions. The initial samples collected in this project have launched a biorepository within our department to allow for continued research in the field.

Our analysis has focused on protein release kinetics from platelet rich fibrin (PRF). Specifically, we were interested in how the protein release rate and quantity changed as a function of age. Older adults would benefit from enhanced regenerative therapies due to age-related perturbations known to affect healing and regeneration potential. Therapies, such as PRF that provide increased growth factors at the surgical site, could be a method to overcome these perturbations. However, PRF has not been well studied in older versus young adults.

Our studies found decreased circulating growth factors, measured in the serum, in older adults compared to young. The PRF preparation similarly increased the growth factor quantity in older and young adults with only a slight reduction in old adults. Interestingly, we also analyzed the inflammatory cytokines present in the PRF from older and younger adults. Older adults are known to have increased levels of circulating inflammatory cytokines, and we were interested if these inflammatory proteins were similarly concentrated in PRF in the same manner as growth factors. Indeed, our findings demonstrated increased inflammatory cytokines in the PRF from older adults compared to young.

These findings suggest that PRF may be a beneficial method for enhancing healing in older adults by delivering increased growth factors to the surgical site. However, the same PRF preparation also appears to increase inflammatory cytokines that may be detrimental if delivered to the healing site. The full clinical implications of these findings are unknown and the focus of our future work.