Effect of Platelet Rich Plasma Application on Postoperative Outcomes Following a CABG

Reza S. Khalafi¹, Darien Bradford¹, Michael G. Wilson²
1-North Texas Affiliated Medical Group, Fort Worth, TX
2-Indiana University School of Medicine, Indianapolis, IN

OBJECTIVE
Recent publications demonstrated improved outcomes during cardiac surgery when platelet rich plasma (PRP and platelet poor plasma (PPP) were applied during closure of the sternal and leg wounds [1,2]. These studies indicate a potential utility for PRP and PPP application in cardiothoracic surgery; however, further studies are necessary to truly measure the clinical efficacy of this intervention. A retrospective analysis of 1128 consecutive coronary artery bypass graft (CABG) cases performed. This study measured the effect of PRP and PPP application during closure of the surgical wound(s) following a CABG.

METHODS
Surgical Method-Standard open surgical methods were used on all median sternotomies. Saphenous vein harvest was done using endoscopic techniques.

PRP Production-The GPS™ II Platelet Concentrate System (Cell Factor Technologies, Warsaw IN) was used to produce 5-7cc of PRP and 25-35cc of PPP from a 55cc whole blood draw anticoagulated with 5cc of ACD-A.

PRP Application-The platelet rich or platelet poor fractions were applied simultaneously with a mixture of 1000 units of thrombin per 1ml of 10% calcium chloride solution during surgical closure at the chest and leg wound site.

Data Analysis-Categorical values were evaluated with χ² analysis. Continuous values were evaluated with a student’s t-test (α=0.05). Propensity scoring was done using observed covariates following reduction of selection bias.

RESULTS
Chest Wound-There was 1 (0.18%) case of chest infection (superficial) in the PRP group and 11 (1.98%) cases of chest infection in the control group. Postoperative drainage of the chest wound occurred in 3 (0.59%) of the PRP cases (0.59%) and 30 (5.39%) of the control cases.

Leg Wound- 541 PRP cases and 445 control cases required saphenous vein harvest. There were 0 PRP and 3 (0.66%) control cases with postoperative leg wound infection. Postoperative drainage of the leg wound was seen in 59 (10.91%) of the PRP cases and 208 (45.79%) of the control cases.

Propensity Scoring- Propensity scores were generated and used to produce odds ratios for the outcome measures. It was concluded that PRP application reduced the likelihood of sternal infection by 93%, the likelihood of sternal drainage by 96%, and the likelihood of leg wound drainage by 88% compared to the control group.

CONCLUSIONS
The analysis of this retrospective case series demonstrated a significant reduction in the likelihood of wound disturbances of the chest and leg when PRP and PPP were applied during surgical closure following a CABG. No adverse events related to this therapy were noted. Further investigation into autologous blood products as surgical adjunct during cardiothoracic procedures is warranted.

REFERENCES