

# Autologous Platelet Gel and Platelet-Poor Plasma Reduce Pain With Total Shoulder Arthroplasty

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**Abstract:** The recovery of patients undergoing total shoulder arthroplasty (TSA) can be adversely affected by a number of complications. Autologous platelet gel (APG), produced by activating platelet-rich plasma (PRP), has been shown to improve hemostasis and wound healing and reduce infections in some surgical procedures. Activated platelet-poor plasma (PPP) has also been used as a hemostatic agent. This study examines the effects of APG and PPP treatment on TSA patients postoperatively. After Institutional Review Board (IRB) approval, 40 patients undergoing TSA at our institution were prospectively enrolled in our study. They were randomized into either a control ( $n = 20$ ) or study ( $n = 20$ ) group, with the study group receiving APG and PPP treatment. Preoperative demographic data, pre- and postoperative laboratory data, pain scores, pain medication, complications, pre- and postoperative range of motion measurements, and postoperative lengths of stay were recorded for each group. The preoperative internal rotation index was significantly higher in the control group compared with treatment patients

( $4.64 \pm 4.46$  vs.  $1.88 \pm 2.44$ ,  $p < .05$ ). The percent hemoglobin retained postoperatively was higher in the treatment group at 24 ( $84.54 \pm 5.32$  vs.  $79.87 \pm 8.73$ ) and 72 hours ( $87.46 \pm 16.03$  vs.  $76.70$  vs.  $5.96$ ), but neither difference reached statistical significance. The treatment group had significantly lower pain scores ( $p = .007$ ) and total fentanyl requirements ( $p < .05$ ) compared with control patients. The internal rotation index improvement factor (postoperative internal rotation index/preoperative internal rotation index) was significantly higher in the treatment group vs. the control group ( $p < .05$ ). Although it did not reach statistical significance, the treatment group was discharged almost 9 hours earlier than the control group ( $64.44 \pm 15.23$  vs.  $73.39 \pm 15.37$ ). APG and PPP treatment decreased pain and provided a greater increase in internal rotation measurements postoperatively. **Keywords:** osteoarthritis, total shoulder arthroplasty, platelet-rich plasma, platelet-poor plasma, autologous platelet gel, growth factors. JECT. 2007;39:177-182