Title: Does estradiol supplementation improve rotator cuff repair outcomes in post-menopausal women?

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Introduction: Although rotator cuff tears (RCT) are one the most common musculoskeletal sources of disability, healing after rotator cuff repair (RCR) fails in >25% of cases. Estradiol deficiency is common in women undergoing RCR and estradiol deficiency is associated with worse outcomes at six months post-operatively. Thus, the purpose of this study was to determine whether estradiol supplementation among post-menopausal women is associated with better outcomes after RCR and we hypothesized that such an association would exist.

Methods: This is a retrospective study of patients who underwent RCR by the lead author over the age of 50, and thus presumed to be post-menopausal. For all patients, all medications were recorded the day of surgery by the anesthesiologist as part of their history and documented in their pre-anesthetic notes. These notes were reviewed to determine which patients were taking systemic estradiol supplementation at the time of surgery. All patients were contacted at two years post-operatively. At this point and pre-operatively, the subjective shoulder value (SSV), visual analogue scale for pain (VAS), and American Shoulder and Elbow Surgeons Score were collected. Satisfaction and re-operation, as simple “yes/no” binary answers, were also collected.

Results: 254 women underwent RCR, of whom two-year outcomes were obtained in 184 (74%). 16% of these women were on estradiol supplementation at the time of surgery. There were no differences between groups in pre-operative SSV (43±21 treated vs. 38±22 untreated, p=0.21), VAS (5.6±2.3 vs. 5.7±2.3, p=0.77), or ASES scores (46±20 vs. 44±19, p=0.738). However, patients who were post-menopausal and being treated with estradiol at the time of surgery had significantly better VAS (1.2±2.1 vs. 0.3±0.8, p<0.001) and SSV scores (95±10 vs. 87±16, p=0.003) than those who were not being treated with estradiol at 2-years postoperatively. They also had higher satisfaction (96% vs. 92%, p=0.690), higher ASES scores (87±17 vs. 94±11, p=0.146), and lower re-operation rates (8% vs. 16%, p=0.150), although these differences were not statistically significant.

Conclusion: Estradiol supplementation associates with better SSV and VAS scores in post-menopausal women undergoing RCR.