Sleep Quality and Response after Rotator Cuff Repair, Total Shoulder Arthroplasty, and Reverse Shoulder Arthroplasty

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Background: Sleep disturbance secondary to shoulder pathology is a common complaint. Previous studies have shown improvement in sleep quality following common shoulder procedures. The purpose of this study was to assess sleep quality response after arthroscopic rotator cuff repair (aRCR), total shoulder arthroplasty (TSA), and reverse shoulder arthroplasty (RSA). Our hypothesis was that sleep disturbance is greater in degree and longer lasting in post-operative recovery after aRCR compared to shoulder arthroplasty.
Methods: The Pittsburgh Sleep Quality Index (PSQI) and Visual Analog Scale - Quality of Sleep (VAS-QOS) were utilized to measure sleep quality in consecutive patients undergoing aRCR, TSA, and RSA. Sleep quality and PROMs, including the American Shoulder and Elbow Surgeons (ASES) Shoulder Score, Single Assessment Numeric Evaluation (SANE) score, and VAS pain score, were measured pre-operatively and at 2 weeks, 6 weeks, 3 months, and 6 months post-operatively. Patient demographics, pre-operative diagnosis, and comorbidities were recorded. Univariate and multivariate analyses were performed. Correlations between sleep quality metrics and PROMs were assessed.
Results: 141 patients who underwent shoulder surgery participated in this study (aRCR: n = 34, TSA: n = 58, RSA: n = 49). With all shoulder surgeries pooled together, there were significant improvements in sleep quality as measured by PSQI and VAS-QOS from pre-operatively to final follow-up (8.8 vs. 6.0, 55.4 vs. 75.2, $p < 0.01$ for both, respectively). The rate and magnitude of sleep quality improvement varied by surgical intervention. Sleep quality after TSA and RSA showed statistical improvement by 6 weeks post-operatively, which was durable through final follow-up. In contrast, after aRCR patients demonstrated a trend toward worsening sleep quality at 2 weeks with improvement by 3 months post-operatively. In multivariable regression analyses, only the type of surgical intervention, and not pre-operative diagnosis or comorbidities, was associated with sleep quality at final follow-up. Quality of sleep strongly correlated with the SANE score ($r = 0.45$, $p < 0.01$).
Conclusion: Sleep quality improves after shoulder surgery, although the rate of recovery varies by surgical intervention. Sleep quality improves more rapidly after shoulder arthroplasty when compared to aRCR. The SANE score may be a useful surrogate metric in assessing sleep quality.