Patient Text Messaging Service Leads to Improved Post-Operative Outcomes in Total Shoulder Arthroplasty

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INTRODUCTION: Despite the increasing emphasis on patient-centered care, patients often report limited access to surgeons, inadequate perioperative education, and frustration as their care is commoditized[1]. Patient text messaging service has the potential to fill some of the voids by automating daily communication, providing timely information, and enhancing patient education as well as engagement before and after the surgery. This study aims to evaluate the impact of a patient text messaging service platform on post-operative outcomes in patients undergoing total shoulder arthroplasty (TSA). Both post-operative in-office physical exam and patient reported outcomes were considered.

METHODS: A retrospective review of subjects enrolled in the Equinoxe post-market clinical follow-up study was conducted. Two cohorts, one without and one with the use of the patient specific messaging service (exacCoach, Exactech, Gainesville, FL, USA) were created. Both cohorts required the pre-operative (preop) assessment and three-month post-operative (postop) assessment to be completed. The without exacCoach cohort included the last 47 patients enrolled without the use of the text messaging service, while the with exacCoach cohort included the first 47 patients enrolled with the use of the text messaging service. Both cohorts consisted of 41 patients with reverse TSA (rTSA) and 6 patients with anatomic TSA (aTSA). Due to the predominance of rTSA patients in both cohorts, this study exclusively focused on the analysis of rTSA patients. The data analyzed in the study encompassed five outcome measures, including the American Shoulder and Elbow Surgeons Shoulder Score (ASES), range of motion (active abduction, active forward elevation, and active external rotation), and shoulder function (shoulder mobility score). Additionally, overall patient satisfaction at 3-month post-op was compared between the two cohorts, categorized as “worse”, “unchanged”, “better”, and “much better”. To compare outcome measures between two cohorts, three evaluation metrics were employed: I) average “improvement”, calculated the difference between 3-month postop and preop outcome measures, II) percentage of patients achieving minimally clinically important difference (MCID) thresholds, III) percentage of patients achieving substantial clinical benefit (SCB) thresholds for each of the outcome measures. MCID and SCB values for 5 outcome measures corresponding to rTSA prosthesis type is referenced from 2-year follow up studies[2,3]. For all the statistical analysis in the study, normality was assessed using the Shapiro Wilk test ($p >= 0.05$) for both groups. When normality was met in both cohorts, an independent two-sample t-test was conducted, if normality was violated in one group, the Mann-Whitney U test was used. For both cases, a significance level of $p < 0.05$ was applied.

RESULTS SECTION: There was no statistical significance ($p < 0.05$) observed in age, gender, body mass index, diagnosis, and surgery type attributes between the two cohorts. Also, there were no statistically significant difference observed in any of the five outcome measures pre-operatively between two cohorts. Table 1 presents the comparison of outcome measures for both cohorts. The with exacCoach cohort showed higher mean improvement in 4 out of 5 outcome measures, particularly in ASES and active abduction. However, there are no statistically significant differences found in improvement metrics between the two cohorts for all 5 outcome measures. In terms of MCID and SCB metrics, greater portions of patients with exacCoach achieved MCID in 3 out of 5 outcome measures and SCB in all 5 outcome measures over the without exacCoach patients. In terms of overall satisfaction for a total of 41 patients, with exacCoach patients reported (“much better” – 33 and “better” – 8) and without exacCoach patients (“much better” – 30, “better” -7, “unchanged” -2, and no response – 2). The with exacCoach cohort had a relatively higher number of patients reporting “much better” and “better” compared to the without exacCoach cohort.

DISCUSSION: In this pilot study, the use of exacCoach indicates greater improvement in ROM and patient reported results at three-month post-operative visits, despite similarities in pre-operative function. The cohort studied with the use of exacCoach showed proportionally greater achievement of MCID and SCB thresholds over the without cohort. MCID and SCB are measures intended to quantify and gauge the threshold that a patient would perceive as a beneficial and meaningful change due to the treatment. Additional analysis of a larger sample size and data reported at increasing post operative time points are necessary.

SIGNIFICANCE/CLINICAL RELEVANCE: A patient text messaging service like exacCoach may improve clinical outcomes and increase patient engagement in early postoperative period in patients undergoing TSA.

REFERENCES:

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IMAGES AND TABLES:

Table 1: Comparison of outcome measures between with exacCoach and without exacCoach cohorts. Improvement = (3-month postop -preop). % patients MCID = number of patients exhibited MCID / total number of patients and % num patients SCB = number of patients exhibited SCB / total number of patients. MCID: Minimal clinically important difference and SCB: substantial clinical benefit. The groups differences are calculated (with exacCoach – without exacCoach)

Outcome measures	Without exacCoach improvement (mean±SD)	With exacCoach improvement (mean±SD)	Groups mean improvement difference	Without exacCoach		With exacCoach		Groups % patients MCID difference	Groups % patients SCB difference
				% patients MCID	% patients SCB	% patients MCID	% patients SCB		
ASES	35.4 ± 18.2	41.6 ± 18.9	**6.2 (p = 0.181)**	86.7%	66.7%	94.7%	71.1%	**8.1%**	**4.4%**
Active Abduction °	49.8± 44.4	56.1± 48.5	**6.3 (p = 0.545)**	87.8%	75.6%	80.5%	78.1%	**-7.3%**	**2.4%**
Active Forward Elevation°	46.5± 46.6	48.8± 47.4	**2.3 (p = 0.826)**	80.5%	63.4%	80.5%	70.7%	**0%**	**7.3%**
Active External Rotation°	16.6± 24.3	13.1± 22.8	**-3.5 (p = 0.504)**	80.5%	68.3%	85.4%	70.7%	**4.9%**	**2.4%**
Shoulder Function	3.2± 2.8	3.6± 2.2	**0.4 (p = 0.541)**	84.2%	63.2%	92.7%	68.3%	**8.5%**	**5.1%**