## Assessment of Deltoid Muscle Volume and Fatty Infiltration on Clinical Outcomes After Reverse Total Shoulder Arthroplasty

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**Introduction**: The biomechanical principles of reverse total shoulder arthroplasty (rTSA) rely on a functioning deltoid muscle to restore stability and function to a rotator-cuff deficient shoulder. With rTSA, the inverted concavities act as a fixed-fulcrum to convert the superiorly directed pull of the deltoid into arm elevation and rotation. The inverted concavities also medialize the center of rotation to increase the deltoid moment arm length and reduce the deltoid force required to generate motion relative to the native shoulder. While rTSA has been demonstrated to reliably treat a wide variety of indications, not all patients achieve the same magnitudes of improvement. Given this reliance on a functioning deltoid, it may be that pre-operative deltoid characteristics influence an individual's capability to achieve excellent clinical outcomes after rTSA. The goal of this pilot study is to analyze pre-operative computed tomography (CT) scans of rTSA patients with 2 years minimum follow-up to quantify deltoid muscle characteristics and correlate those deltoid measurements to clinical outcome measures in order to identify new relationships associated with good and poor clinical outcomes after rTSA.

**Methods**: Pre-operative CT images from 61 primary rTSA patients were used to characterize the deltoid muscle. The overall cohort of 61 rTSA was composed of 31 (28F/3M) patients classified as having "good" clinical outcomes and 30 (26F/4M) patients classified as having "poor" outcomes at 2-year minimum follow-up (29 months average). These patients were retrospectively selected from an IRB-approved multi-center clinical database of a single, platform shoulder arthroplasty system. This database collects demographic, implant, clinical and radiographic measures, including 4 ROM measures (active abduction, forward elevation, IR score, and external rotation) and 6 PROMs (SST, Constant, ASES, UCLA, SPADI, SAS). Patients with good and poor outcomes were selected based upon patient satisfaction ranking and magnitude of clinical improvement; patients were also matched for age, gender, and implant size to minimize variables between cohorts. Specifically, all patients had a 38mm glenosphere and a humeral liner + tray combination  $\leq 2.5$ mm offset. Deltoid morphological measures were: deltoid volume, deltoid length, cross-sectional area, deltoid muscle percent volume, deltoid fat percent volume, and moment arm lengths of the anterior, middle, and posterior heads of the deltoid. CT images were imported into Horos (Purview, Annapolis, MD) and images of the deltoid were segmented to create masks. Deltoid volume was calculated from the sum of the number of voxels in the mask times the voxel volume. Mean attenuation of the voxels within the deltoid volume was calculated in Hounsfield units. Hounsfield tresholding was used to classified voxels as fat, intermediate tissue, or muscle based on the attenuation of voxels (Fat: -190 to -30, Intermediate:-29 to 29, Muscle: 30 to 130). For each of the anterior, middle, and posterior heads of the deltoid tresholding was used to classified voxels as fat, intermediate center, from which, a static moment arm was calculated. A two-tailed t-test was used to compare mean values for each rTSA co

**Results**: Two-year minimum clinical outcomes for the 61 rTSA patients is presented in Table 1; deltoid muscle measurements associated with these patients are presented in Table 2. The only pre-operative difference between rTSA patients in the good and poor outcomes cohorts was that poor outcomes patients had deltoids with significantly larger cross-sectional area as compared to deltoids from good outcome patients. Table 3 presents the Pearson correlations between each deltoid measurement for the overall rTSA cohort and for the cohorts of good and bad outcomes demonstrating that numerous measurements were highly correlated with one or the other. Also presented in Table 3 are the Pearson correlations between the deltoid measurements and pre-operative and post-operative clinical outcomes for the overall rTSA cohort and for the cohorts of good and bad outcomes.

Overall deltoid volume was moderately positively correlated to 4 of 6 pre-operative PROM scores (Constant, ASES, UCLA, and SAS) and moderately positively correlated to 1 post-operative SAS score for patients in the poor outcome cohort. However, overall deltoid volume was not correlated to any preoperative or post-operative PROM for the overall cohort or patients in the good outcome cohort. Deltoid length was moderately positively correlated with preoperative max weight for the overall cohort and the poor outcome cohort, and also correlated to the pre-operative SAS score for the poor outcome cohort. Deltoid length was negatively correlated to post-operative active abduction for the good outcome cohort. Deltoid length was also moderately positively correlated to post-operative max weight and the post-operative Constant and SAS scores for the poor outcome cohort. Deltoid cross-sectional area was not correlated to any pre-operative or post-operative outcome measure for any patient cohort. Similarly, mean anterior, middle, and posterior deltoid moment arm measurements were not correlated to any pre-operative outcome measure for any patient cohort; however, the mean anterior deltoid moment arm was observed to be moderately positively correlated to the post-operative UCLA score and the mean middle deltoid moment arm was moderately positively correlated to post-operative active abduction for the poor outcome cohort. Mean deltoid Hounsfield units were moderately positively correlated to the pre-operative and post-operative IR score for the poor outcome cohort, moderately positively correlated to post-operative active forward elevation for all cohorts, moderately positively correlated to post-operative max weight and the Constant score for the overall cohort and the poor outcome cohort, and moderately positively correlated to the post-operative SST and SAS scores for the poor outcome cohort. Deltoid muscle percent volume was moderately positively correlated to preoperative and post-operative active forward elevation and to 4 of 6 pre-operative PROM scores (SST, Constant, SPADI, and SAS) for the good outcome cohort. Deltoid muscle percent volume was also moderately positively correlated to the pre-operative IR score and the post-operative SAS score for the poor outcome cohort. Deltoid muscle percent volume was also moderately positively correlated to active post-operative max weight and post-operative Constant score for both the overall cohort and poor outcome cohort. Numerous moderately negative correlations were associated with the pre-operative and postoperative outcome measures for Hounsfield measurements in the intermediate range. Deltoid fat percent volume was moderately negatively correlated to preoperative IR score, to 3 of 6 pre-operative PROM scores (Constant, ASES, and SAS), and to the post-operative max weight for the good outcome cohort. Deltoid fat percent volume was also moderately negatively correlated to the post-operative SAS score for the poor outcome cohort.

**Discussion**: This pilot study identified numerous deltoid measurements that correlated with pre-operative and post-operative clinical outcomes for the overall rTSA cohort and for patients with both good and poor outcomes. All deltoid measurements analyzed in this study can be obtained from CT-based pre-operative planning software; given the wide-spread adoption of planning software, an improved understanding of the relationship between deltoid morphology and clinical outcomes has potential to improve pre-operative decision making and also better predict post-operative outcomes, if these measures are integrated within the software. This study has several limitations. First, the use of pre-defined good and poor outcome cohorts may introduce some selection bias, future work should analyze a more uniform and normalized patient cohort. Second, 61 patients is a relatively small sample, future studies should increase the number of patients to better represent the rTSA population and improve study power to increase the probability of identifying deltoid measurements that are relevant and meaningful to rTSA clinical outcomes. Third, this study utilized CT scans of multiple image kernels, future work should quantify the impact of different kernels on Hounsfield unit-based threshold measurements. Finally, our linear correlation analysis was relatively simple and did not assess the predictive accuracy associated with any image measurement, future work should utilize more advanced machine-learning based techniques to investigate the capability of these CT image-based deltoid measurements to predict post-operative outcomes after rTSA.

Significance: Numerous CT image-based deltoid measurements, including deltoid volume, deltoid length, and deltoid muscle/fat percentage were correlated to pre-operative and post-operative rTSA clinical outcomes, knowledge of these relationships has the potential to improve surgical decision making and better predict post-operative clinical outcomes.

Pre-operative Outcomes, Post- operative Outcomes	Active Abduction	Active Forward Elevation	IR Score	Active External Rotation	Max Weight	SST	Constant	ASES	UCLA	SPADI	SAS
All Patients (n=61)	77.4 ± 27.3,	99.8 ± 38.5,	3.9 ± 1.7,	19.1 ± 19.5,	2.0 ± 2.3,	4.1 ± 2.9,	39.8 ± 14.4,	34.8 ± 16.3,	13.2 ± 4.1,	83.9 ± 21.1,	47.1 ± 11.1,
	116.5 ± 34.1	137.5 ± 33.9	$4.8 \pm 1.9$	43.9 ± 21.2	$7.2 \pm 4.5$	9.3 ± 3.2	64.3 ± 19.0	74.6 ± 25.8	28.2 ± 7.3	32.8 ± 32.6	74.0 ± 17.3
Good Outcome	70.2 ± 24.4,	92.3 ± 35.4,	3.6 ± 1.8,	18.4 ± 19.4,	2.0 ± 1.8,	4.1 ± 3.0,	36.9 ± 12.9,	34.4 ± 17.3,	12.8 ± 4.1,	81.7 ± 22.3,	45.3 ± 11.7,
Patients (n=31)	137.4 ± 21.1	159.4 ± 14.6	$5.9 \pm 0.9$	54.8 ± 16.3	10.5 ± 3.2	11.7 ± 0.6	81.7 ± 7.0	97.1 ± 2.8	34.1 ± 0.9	4.6 ± 4.7	89.1 ± 4.3
Poor Outcome Patients	82.9 ± 29.0,	107.5 ± 40.6,	4.2 ± 1.6,	19.8 ± 20.0,	2.1 ± 2.7,	4.0 ± 2.8,	42.7 ± 15.3,	35.2 ± 15.4,	13.6 ± 4.1,	86.2 ± 20.0,	49.0 ± 10.2,
(n=30)	94.8 ± 31.5	115.0 ± 33.6	$3.6 \pm 1.8$	32.5 ± 19.9	4.9 ± 3.9	6.7 ± 2.7	52.0 ± 14.5	51.4 ± 16.4	22.0 ± 5.7	62.0 ± 20.9	58.3 ± 10.2
P Value (Good vs Poor	0.0687,	0.1223,	0.1621,	0.7852,	0.8596,	0.8971,	0.1447,	0.8472,	0.4552,	0.4099,	0.1827,
for Pre-op, Post-op)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

 Table 1. Comparison of 2-Year Minimum Pre-operative and Post-operative Clinical Outcomes for all rTSA Patients and those Patients Classified as Having Good and Poor Outcomes

## Table 2. Comparison of CT Based Deltoid Muscle Measurements for all rTSA Patients and those Patients Classified as Having Good and Poor Outcomes

	Deltoid Volume (mL)	Deltoid Length (mm)	Deltoid Cross- Sectional Area (cm^2)	Mean Deltoid Hounsfield Unit	Deltoid Muscle Hounsfield	Deltoid Intermediate Hounsfield	Deltoid Fat Hounsfield	Anterior Deltoid Moment Arm	Middle Deltoid Moment Arm	Posterior Deltoid Moment Arm
All Patients (n=61)	439.5 ± 124.6	254.8 ± 58.0	33.9 ± 8.2	52.7 ± 14.0	82.7% ± 10.4%	13.6% ± 8.6%	3.7% ± 2.1%	31.6 ± 4.0	40.2 ± 5.7	56.5 ± 9.4
Good Outcome Patients (n=31)	416.7 ± 125.0	253.9 ± 53.8	31.5 ± 8.4	54.2 ± 15.1	84.3% ± 12.2%	12.1% ± 10.3%	3.7% ± 2.3%	31.5 ± 4.4	39.8 ± 6.4	54.7 ± 10.3
Poor Outcome Patients (n=30)	463.1 ± 121.8	255.7 ± 62.8	36.3 ± 7.3	51.1 ± 12.9	81.0% ± 8.2%	15.2% ± 6.4%	3.7% ± 2.1%	31.7 ± 3.7	$40.5 \pm 5.1$	58.3 ± 8.2
P Value (Good vs Poor for Pre-op, Post-op)	0.1475	0.9078	0.0224	0.3906	0.2276	0.1496	0.9233	0.8583	0.6134	0.1335

Table 3. Correlation of CT Based Deltoid Muscle Analysis Measurements to Pre-operative and Post-operative Outcome Measures for all rTSA Patients and
those Patients Classified as Having Good and Poor Outcomes at 2-Years Minimum Follow-up. Green highlight for High-Correlation Coefficients $\geq 0.6$ ;
Yellow highlight for Moderate-Correlation Coefficients >0.4 & <0.6.

National angleProcess of the second locational loca	Pearsons Correlations (All Patients, Good Outcomes, Poor Outcomes)	Deltoid Volume (mL)	Deltoid Length (mm)	Deltoid Cross- Sectional Area (cm^2)	Mean Deltoid Hounsfield Unit	Deltoid Muscle Hounsfield	Deltoid Intermediate Hounsfield	Deltoid Fat Hounsfield	Anterior Deltoid Moment Arm	Middle Deltoid Moment Arm	Posterior Deltoid Moment Arm
Detector         Part resk         Part resk <th< td=""><td>Deltoid Length (mm)</td><td>0.690, 0.711, 0.691</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Deltoid Length (mm)	0.690, 0.711, 0.691									
Mean Median0.52.60.50.4 <th< td=""><td>Deltoid Cross- Sectional Area (cm^2)</td><td>0.523, 0.446, 0.545</td><td>-0.178, -0.265, -0.117</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Deltoid Cross- Sectional Area (cm^2)	0.523, 0.446, 0.545	-0.178, -0.265, -0.117								
Detector         0.286, 0.287, 0.287, 0.287, 0.284, 0.204         0.140, 0.293         0.274         0.275         0.274         0.275         0.274         0.275	Mean Deltoid Hounsfield Unit	0.361, <mark>0.516</mark> , 0.285	<mark>0.566</mark> , <mark>0.668</mark> , <mark>0.485</mark>	-0.204, -0.138, -0.212							
Detourneried bounded outgoing bounded bounded outgoing0.022.010.022.010.020.000.00	Deltoid Muscle Hounsfield	0.270, <mark>0.427</mark> , 0.238	<mark>0.434, 0.473,</mark> <mark>0.448</mark>	-0.146, 0.055, -0.204	0.874, 0.749, 0.956						
Detbody         0.207, 0.27, 0.208, 0.299, 0.009, 0.007, 0.007         0.207, 0.021, 0.007         0.201, 0.027, 0.021         0.201, 0.027, 0.202, 0.202, 0.204         0.21, 0.027, 0.202, 0.204         0.21, 0.027, 0.0007         0.060, 0.07, 0.005, 0.000, 0.00,	Deltoid Intermediate Hounsfield	-0.251, <mark>-0.424</mark> , -0.227	-0.427, -0.474, -0.448	0.172, -0.039, 0.219	-0.867, -0.742, - <mark>0.950</mark>	-0.993, -0.989, -0.995					
Interior olividi         0.255, 0.324, 0.329         0.187, 0.026, 0.329         0.007         0.011         0.0270         0.028, 0.028         0.026, 0.028         0.026, 0.027         0.026, 0.021         0.026, 0.020, 0.021         0.026, 0.020, 0.023         0.026, 0.021         0.026, 0.021         0.026, 0.021         0.026, 0.021         0.007, 0.026, 0.021         0.026, 0.021         0.027, 0.021         0.026, 0.021         0.000, 0.021         0.000, 0.011         0.024         0.021, 0.021         0.000, 0.011         0.024         0.021, 0.011         0.000, 0.011         0.024         0.021, 0.011         0.000, 0.011         0.024         0.011         0.024         0.011         0.024, 0.011         0.011         0.024         0.024         0.011         0.011         0.012         0.011         0.012         0.011         0.011         0.012         0.011         0.012         0.011         0.011         0.012         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011         0.011	Deltoid Fat Hounsfield	-0.307, -0.372, -0.262	-0.396, -0.399, -0.399	0.020, -0.094, 0.107	-0.773, -0.661, -0.870	-0.876, -0.886, -0.902	0.812, 0.807, 0.856				
Naidle celloai         0.0148 (0.152)         -0.053 (0.11)         0.014 (0.014)         0.004 (0.014)         0.004 (0.014)         0.005 (0.076)         0.009           Posterior Detroid         0.655 (0.468)         0.156 (0.266)         0.025 (0.106)         0.025 (0.106)         0.026 (0.101)         0.026 (0.101)         0.024 (0.014)         0.009 (0.014)         0.009 (0.014)         0.009 (0.014)         0.009 (0.014)         0.009 (0.014)         0.009 (0.014)         0.009 (0.014)         0.009 (0.014)         0.011 (0.016)         0.014         0.021 (0.014)         0.011 (0.016)         0.011 (0.016)         0.011 (0.016)         0.011 (0.016)         0.011 (0.016)         0.011 (0.016)         0.011 (0.016)         0.014 (0.012)         0.014 (0.012)         0.014 (0.014)         0.019 (0.017)         0.016 (0.017)         0.014 (0.014)         0.019 (0.017)         0.014 (0.014)         0.019 (0.016)         0.014 (0.014)         0.019 (0.016)         0.018 (0.017)         0.014 (0.017)         0.016 (0.017)         0.014 (0.017)         0.010 (0.016)         0.018 (0.017)         0.012 (0.011 (0.013)         0.016 (0.017)         0.012 (0.011 (0.013)         0.016 (0.017)         0.012 (0.011 (0.013)         0.016 (0.018)         0.018 (0.017)         0.012 (0.017)         0.012 (0.017)         0.012 (0.017)         0.012 (0.017)         0.012 (0.017)         0.012 (0.017)         0.012 (0.	Anterior Deltoid Moment Arm	0.265, 0.324, 0.216	0.155, -0.010, 0.329	0.187, <mark>0.445</mark> , -0.007	0.167, 0.118, 0.211	0.207, 0.121, 0.270	-0.183, -0.065, -0.263	-0.271, -0.275, -0.268			
Prestnorboriod         Désis, 0.483, 0.433, 0.432, 0.024, 0.432, 0.024, 0.027, 0.024         0.031, 0.103, 0.024         0.020, 0.035, 0.024, 0.014, 0.034         Diss, 0.024, 0.028, 0.024         Diss, 0.024, 0.028, 0.024         Diss, 0.028, 0.026         Diss, 0.028, 0.026         Diss, 0.028, 0.026         Diss, 0.028, 0.026         Diss, 0.02	Middle Deltoid Moment Arm	<mark>0.418, 0.532</mark> , 0.323	-0.053, 0.111, -0.215	0.711, 0.625, 0.798	-0.090, -0.023, -0.126	-0.128, -0.146, -0.105	0.147, 0.164, 0.125	0.034, 0.071, 0.005	0.096, 0.370, -0.098		
Internation         Data	Posterior Deltoid	0.465, 0.483,	0.165, 0.206,	0.462, 0.445,	0.135, 0.146,	0.091, 0.042,	-0.062, -0.010,	-0.190, -0.135,	-0.002, 0.285,	0.605, 0.601,	
Adduction         O.246         O.121         O.176         O.103         -0.179         O.137         O.233         O.214         -0.019         -0.115           Preop Atter forward         0.233         0.320         0.056         0.331         0.252         0.042         0.374         0.042         0.056         0.056         0.057         0.021         0.056         0.056         0.033         0.232         0.224         0.057         0.056         0.056         0.056         0.035         0.227         0.042         0.055         0.006         0.040         0.056         0.066         0.040         0.056         0.006         0.066         0.030         0.076         0.020         0.066         0.040         0.038         0.076         0.020         0.046         0.030         0.066         0.040         0.038         0.076         0.066         0.040         0.035         0.027         0.036         0.018         0.028         0.048         0.013         0.025         0.026         0.036         0.018         0.018         0.018         0.019         0.056         0.026         0.026         0.028         0.028         0.028         0.028         0.028         0.028         0.028         0.028         0.028	Preop Active	0.113, -0.132,	-0.032, -0.192,	0.192, 0.074,	-0.010, 0.179,	-0.066, 0.225,	0.062, -0.218,	0.068, -0.215,	-0.135, -0.151,	-0.014, -0.047,	0.009, 0.072,
Elevation         0.333         0.320         0.068         0.331         0.230         0.242         0.041         0.042         0.122         0.055           Prop IR Score         0.260         0.322         0.032         0.021         0.037         0.273         0.232         0.026         0.008         0.056         0.026         0.008         0.038         0.276         0.01         0.033         0.027         0.021         0.001         0.028         0.006         0.008         0.028         0.026         0.006         0.008         0.028         0.021         0.031         0.017         0.021         0.005         0.024         0.026         0.024         0.026         0.024         0.026         0.024         0.026         0.024         0.026         0.024         0.026	Abduction Preop Active Forward	0.246	0.121 0.227, 0.146,	0.176	-0.103 0.336, 0.417,	-0.179 0.258, <mark>0.419</mark> ,	0.149 -0.252, <mark>-0.414</mark> ,	0.293	-0.141 -0.056, -0.088,	-0.019 -0.126, -0.163,	-0.115 0.042, 0.084,
Preop Riscore         0.260         0.322         0.021         0.448         0.496         0.497         0.038         0.006         0.000         0.033           Preop Active External         0.144, 0.207         0.227, 0.243         0.019, 0.074,         0.014, 0.161,         0.039, 0.035,         0.022, 0.034,         0.101, 0.033,         0.176, 0.034,         0.016,         0.039, 0.035,           Preop Max Weight         0.270, 0.060,         0.406, 0.314,         0.066, 0.222,         0.385, 0.303,         0.244, 0.156,         0.419, 0.155,         0.124,         0.005,         0.124,         0.009,         0.068,         0.018           Preop Max Weight         0.391         0.436,         0.004,         0.151         0.155,         0.124,         0.193,         0.044,         0.124,         0.099,         0.061,           1144         0.199         0.064,         0.219         0.280,         0.280, 587,         0.201,         0.483,         0.249, 0.007,         0.008,         0.037           Preop LCAL         0.239, 0.017,         0.280, 0.314,         0.277, 0.424, 0.197,         0.230, 0.018,         0.178, 0.481,         0.237, 0.414,         0.239, 0.037,         0.242, 0.107,         0.038, 0.138, 0.178,         0.037, 0.011,         0.048, 0.144,         0.230, 0.037,<	Elevation	0.333	0.320	0.068	0.331	0.230	-0.242	-0.147	-0.042	-0.128	-0.055
Preop Attive External         -0.144, -0.207,         -0.227, -0.248,         -0.019, 0.015,         -0.029, -0.015,         0.027, -0.036,         0.027, 0.066,         0.006,         0.038, -0.02,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.026,         0.038, -0.036,         0.027, -0.038, -0.038,         0.027, -0.038, -0.038,         0.027, -0.038, -0.038,         0.038, -0.037,         0.038, -0.037,         0.038, -0.037,         0.038, -0.037,         0.038, -0.037,         0.038, -0.038,         0.027, -0.040,         0.0118,         0.033, -0.047,         0.038, -0.038,         0.027, -0.040,         0.0134,         0.033, -0.047,         0.038, -0.032,         <	Preop IR Score	0.260	0.322	-0.021	0.448	0.490	- <mark>0.527</mark>	-0.262	-0.006	-0.040	0.030
Preop Max Weight         0.270, 0.060, 0.393         0.046, 0.282, 0.335, 0.33, 0.243, 0.156, 0.284, 0.129, 0.280         0.249, 0.155, 0.290         0.249, 0.156, 0.306         0.249, 0.156, 0.306         0.249, 0.156, 0.302         0.249, 0.156, 0.325         0.275, 0.170, 0.085         0.056, 0.055, 0.124, 0.170, 0.018         0.144, 0.121, 0.019         0.006, 0.018, 0.018           Preop SST         0.287, 0.002, 0.128         0.204, 0.208, 0.017, 0.282, 0.042, 0.390         0.064, 0.191, 0.190         0.190         0.064, 0.191, 0.202, 0.017, 0.283, 0.017, 0.283, 0.017, 0.285, 0.027, 0.038, 0.119, 0.033, 0.004, 0.224, 0.107, 0.033, 0.004, 0.224, 0.107, 0.012, 0.1014, 0.018, 0.144, 0.230, 0.057, 0.033, 0.004, 0.027, 0.018, 0.144, 0.230, 0.057, 0.033, 0.004, 0.027, 0.018, 0.144, 0.230, 0.057, 0.033, 0.004, 0.033, 0.010, 0.128, 0.130, 0.033, 0.024, 0.033, 0.010, 0.013, 0.279, 0.021, 0.035, 0.034, 0.013, 0.244, 0.010, 0.013, 0.244, 0.010, 0.013, 0.244, 0.010, 0.013, 0.244, 0.010, 0.013, 0.244, 0.010, 0.013, 0.245, 0.013, 0.277, 0.055, 0.033, 0.011, 0.249, 0.028, 0.011, 0.249, 0.028, 0.013, 0.247, 0.010, 0.139, 0.015, 0.015, 0.016, 0.039, 0.015, 0.016, 0.039, 0.015, 0.016, 0.039, 0.015, 0.016, 0.039, 0.013, 0.027, 0.016, 0.013, 0.277, 0.021, 0.006, 0.031, 0.015, 0.016, 0.033, 0.011, 0.244, 0.025, 0.038, 0.016, 0.031, 0.027, 0.0060, 0.016, 0.031, 0.037, 0.027, 0.0061, 0.016, 0.031,	Preop Active External Rotation	-0.144, -0.207, -0.101	-0.227, -0.243, -0.211	-0.019, 0.074, -0.123	-0.104, -0.161, -0.050	-0.039, 0.035, -0.081	0.022, -0.034, 0.047	0.101, -0.033, 0.224	-0.176, -0.334, -0.045	-0.107, -0.007, -0.193	0.002, 0.061, -0.059
Preop SST         0.087, -0.002, 0.194         0.204, 0.208, 0.199         0.064         0.191, 0.219         0.026, 0.404, 0.148, 0.193         0.067, 0.211, 0.067         0.211, 0.011, 0.011         0.067, 0.311         0.044, 0.112, 0.011         0.030, 0.031, 0.160           Preop Constant         0.228, 0.049, 0.339, 0.017, 0.398         0.359         0.198         0.340         0.255, 0.475, 0.205, 0.475, 0.407         0.048, 0.035, 0.0072         0.044, 0.112, 0.044, 0.0112         0.009, 0.031, 0.160           Preop ASES         0.239, 0.017, 0.480         0.159, 0.005, 0.352         0.370         0.215         0.225, 0.138, 0.255         0.047, 0.043         0.044, 0.012, 0.043         0.044, 0.0112, 0.018, 0.044, 0.018         0.024, 0.027, 0.033         0.024, 0.026, 0.019, 0.013, 0.007, 0.033         0.030, 0.044, 0.017, 0.019, 0.018, 0.144, 0.220, 0.057, 0.033         0.020, 0.077, 0.043         0.018, 0.144, 0.019, 0.018, 0.144, 0.230, 0.057, 0.033         0.109, 0.018, 0.144, 0.230, 0.057, 0.033         0.103, 0.008, 0.103, 0.008, 0.018, 0.144, 0.119, 0.020, 0.018, 0.144, 0.013, 0.034, 0.033         0.103, 0.018, 0.144, 0.119, 0.020, 0.013, 0.018, 0.144, 0.013, 0.034, 0.033         0.103, 0.024, 0.120, 0.013, 0.044, 0.013, 0.044, 0.014, 0.014, 0.024, 0.025, 0.045, 0.055, 0.055, 0.052, 0.052, 0.052         0.044, 0.011, 0.045, 0.031, 0.044, 0.013, 0.056, 0.031, 0.044, 0.013, 0.056, 0.031, 0.044, 0.013, 0.056, 0.031, 0.054, 0.055, 0.052, 0.025, 0.027, 0.05	Preop Max Weight	0.270, 0.060, 0.391	<mark>0.406</mark> , 0.361, <mark>0.453</mark>	-0.096, -0.292, 0.004	0.335, 0.303, 0.364	0.243, 0.156, 0.290	-0.249, -0.135, -0.306	-0.175, -0.170, -0.182	0.096, 0.055, 0.125	-0.124, -0.197, -0.080	-0.055, -0.216, 0.018
Preop Constant         0.228, 0.049, 0.39         0.240, 0.170, 0.39         0.036, 0.194, 0.340         0.245, 0.485, 0.475, 0.201, 0.484, 0.057, 0.136, 0.047         0.0367, 0.136, 0.047         0.036, 0.194, 0.018           Preop ASES         0.339         0.350         0.370, 0.017, 0.258, 0.189, 0.158, 0.127, 0.126, 0.027, 0.216, 0.225, 0.373, 0.2027, 0.048, 0.119, 0.053, 0.084, 0.318         0.330         0.215         0.239         0.0077         0.040         0.178         0.330           Preop UCIA         0.200, 0.012, 0.024, 0.012, 0.012, 0.014, 0.015, 0.076, 0.208, 0.311, 0.204, 0.226, 0.313, 0.017, 0.120, 0.018, 0.144, 0.350         0.337         0.200         0.037         0.010, 0.012, 0.144, 0.337         0.230, 0.057, 0.250, 0.134, 0.109, 0.098, 0.011, 0.055         0.331         0.020, 0.011, 0.029, 0.011, 0.029, 0.023, 0.057, 0.279, 0.202, 0.335, 0.024, 0.327, 0.136, 0.024, 0.327, 0.136, 0.0337         0.012, 0.046, 0.039, 0.057, 0.219, 0.129, 0.021, 0.055, 0.033, 0.115, 0.213, 0.114, 0.216, 0.007, 0.127, 0.002, 0.003, 0.173, 0.044, 0.043, 0.034, 0.217, 0.044, 0.013, 0.247, 0.044, 0.044, 0.017, 0.002, 0.003, 0.173, 0.044, 0.013, 0.247, 0.002, 0.003, 0.173, 0.044, 0.013, 0.247, 0.012, 0.006, 0.0289, 0.336, 0.337, 0.366, 0.037, 0.002, 0.003, 0.136, 0.300, 0.046, 0.003, 0.027, 0.003, 0.124, 0.131, 0.026, 0.025, 0.038, 0.339, 0.347, 0.034, 0.045, 0.034, 0.131, 0.024, 0.055, 0.035, 0.0350, 0.136, 0.300, 0.046, 0.038, 0.347, 0.036, 0.037, 0.046, 0.13	Preop SST	0.087, -0.002, 0.194	0.204, 0.208,	-0.064, -0.191, 0.064	0.195, 0.170, 0.219	0.250, 0.404 0.148	-0.266, <mark>-0.399</mark> , -0.191	-0.148, -0.358, 0.067	-0.225, -0.138, -0.311	-0.044, -0.112, 0.019	0.093, 0.031,
Lose         0.39         0.198         0.390         0.124         0.223         0.207         0.208         0.007         0.028         0.011           Preop ASES         0.390         0.352         0.370         0.272, 0.416,         0.255, 0.422,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038, 0.119,         0.038,         0.102,         0.144,         0.230, 0.057,         0.270, 0.020,         0.332,         0.0160,         0.044,         0.021,         0.032,         0.103, 0.027,         0.027,         0.037,         0.032,         0.166,         0.011,         0.090,         0.219,         0.355,         0.032,         0.166,         0.011,         0.090,         0.219,         0.257,         0.257,         0.279,         0.211,         0.032,         0.036,         0.336,         0.336,         0.036,         0.036,         0.037,         0.042,         0.037,         0.040,         0.042,         0.040,         0.042,         0.037,         0.040,         0.043,	Preop Constant	0.228, -0.049,	0.240, 0.170,	0.086, -0.194,	0.277, 0.281,	0.245, <mark>0.495</mark> ,	-0.245, <mark>-0.475</mark> ,	-0.201, <mark>-0.445</mark> ,	-0.059, -0.072,	-0.087, -0.136,	0.096, 0.153,
0.440         0.32         0.37         0.215         0.189         -0.209         -0.077         -0.043         0.178         0.337           Preop UCLA         0.505         0.312         0.376         0.240         0.240         0.204         0.296         0.112         0.102         0.141         0.350           Preop SPADI         -0.165, 0.064,         0.227, -0.162,         0.077, 0.257,         0.279, -0.202,         0.356, 0.428,         0.373, 0.441,         0.234, 0.322,         0.103, 0.098,         0.060, 0.337,         -0.165, 0.020,           Preop SAS         0.253, -0.057,         0.245, 0.139,         0.10, -0.128,         0.252, 0.173,         0.316, 0.407,         -0.045, -0.039,         -0.011, -0.090,         0.219, 0.129,           Preop SAS         0.253, -0.057,         0.245, 0.139,         0.101, 0.029,         0.058, -0.636,         0.115, 0.113,         0.141, 0.216,         0.007, 1027,         -0.003,         0.173, 0.044,         0.043, 0.034,           Abduction         0.179         0.011         0.249         0.188         0.130,         -0.130,         0.0077,         0.027,         0.040, 4.035,           Post-op Active         -0.022, 0.184,         0.159, 0.027,         0.239, 0.036,         0.338, 0.347,         0.048, 0.074,         0.055,	Preop ASES	0.239, 0.017,	0.258, 0.189,	0.158	0.154, 0.102,	0.203	-0.265, -0.393	-0.255, <mark>-0.427</mark> ,	0.038, 0.119,	0.053, -0.084,	0.224, 0.107,
Discos         0.508         0.312         0.376         0.240         0.177         0.193         -0.082         -0.102         0.111         0.359           Preop SPADI         -0.105, 0.064, .0.338         0.227, -0.122, .0.320         0.0356, 0.0428, .0.337         0.336         0.322         0.1046         0.0111         0.059, .0.060, 0.337, .0.035         0.069, 0.337, .0.332         0.146         0.011, 0.098, .0.063         0.069, 0.337, .0.351         0.032         0.044         0.044, .0.234, 0.223, 0.023, .0.063         0.011, 0.099, .0.063         0.011, 0.099, .0.090, 0.219, 0.129, .0.027, 0.061, .0.039         0.011, 0.099, .0.257         0.011, 0.029, .0.038         0.336         0.367, .0.134         0.007, 0.172, .0.003, 0.011, 0.029, .0.003, 0.011, 0.029         0.013, 0.297, .0.024         0.130         0.077         0.002, 0.003, .0.173, 0.044, .0.027, 0.064, 0.124, .0.121, 0.105, .0.027, 0.064, 0.124, .0.027, 0.064, 0.124, 0.106, .0.027, 0.064, 0.124, 0.102, .0.007, 0.055, 0.052, 0.027, 0.054, .0.027, 0.064, 0.124, 0.102, .0.007, 0.055, 0.052, 0.027, 0.054, .0.027, 0.064, 0.124, 0.102, .0.007, 0.055, 0.052, 0.023, 0.020, .0.002, 0.030, 0.130         0.067         0.027, 0.064, .0.027, 0.064, 0.012, 0.015, .0.063, 0.051, 0.156, 0.051, 0.156, 0.051, 0.156, 0.051, 0.156, 0.051, 0.156, 0.051, 0.156, 0.051, 0.156, 0.051, 0.166, 0.026, .0.027, 0.026, 0.027, 0.026, 0.027, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.028, 0.027, 0.028, 0.028, 0.024, 0.024, 0.024, 0.024, 0.024, 0.024, 0.024, 0.025, 0.028, 0.025, 0.028, 0.023, 0.214, 0.029, 0.033, 0.154, 0.033,	Preop UCLA	0.490 0.200, -0.129,	0.352	0.370	0.215 0.150, 0.076,	0.189	-0.209 -0.204, -0.296,	-0.077 -0.192, -0.313,	-0.043 -0.107, -0.120,	0.178	0.337
Preop SrADI         -0.338         -0.320         -0.150         -0.337         -0.306         0.332         0.146         0.111         -0.195         -0.351           Preop SAS         0.253, -0.057, 0.245, 0.139, 0.100, -0.128, 0.252, 0.173, 0.040, -0.386, 0.336, 0.037, 0.045, -0.063, 0.039, 0.0154, 0.063         -0.0154, 0.063         -0.045, -0.039, 0.033, 0.040, 0.029, 0.058, -0.63, 0.115, -0.213, -0.141, 0.216, 0.007, 0.172, 0.002, -0.003, 0.173, 0.044, -0.043, -0.034, 0.046, 0.181           Post-op Active         -0.022, 0.184, 0.184, 0.304, 0.211, -0.029, 0.400, 0.499, 0.499, 0.496, 0.437, 0.408, 0.144, 0.055, 0.052, 0.027, -0.027, 0.061, -0.121, 0.106, 0.131         0.277, -0.027, 0.061, -0.121, 0.106, 0.057, 0.027, -0.293, 0.336, 0.302, 0.040, 0.333, 0.187, -0.388, 0.347, 0.048, 0.0174, 0.0048, 0.0174, -0.027, -0.061, 0.121, 0.106, 0.055, 0.052, 0.022         -0.025, -0.027, -0.061, 0.121, 0.106, 0.057, 0.027, -0.027, 0.060, 0.441, 0.389, 0.389, 0.337, 0.304, 0.130, -0.067, 0.016         -0.130, -0.067, 0.016, 0.015, 0.052, 0.022, -0.027, 0.014, 0.121, 0.106, 0.055, 0.312, 0.441, 0.024, 0.024, 0.102, 0.105, 0.135, 0.063, 0.051, 0.134, 0.293, 0.302, 0.44, 0.337, 0.389, 0.337, 0.304, 0.130, -0.067, 0.016         -0.057, 0.039, 0.207, 0.027, 0.022, 0.104, 0.021, 0.024, 0.102, 0.105, 0.135, 0.063, 0.051, 0.131, 0.227, 0.048, 0.131, 0.249, 0.027, 0.022, 0.020, 0.004, 0.015, 0.014, 0.024, 0.102, 0.005, 0.330, 0.14, 0.130, 0.247, 0.102, 0.027, 0.028, 0.130, 0.044, 0.014, 0.015, 0.144, 0.024, 0.024, 0.102, 0.105, 0.139, 0.250, 0.130, 0.166, 0.172, 0.108, 0.027, 0.048, 0.141, 0.045, 0.275, 0.139, 0.335, 0.134, 0.239, 0.330, 0.140, 0.130, 0.256, 0.133, 0.119, 0.224, 0.014, 0.256, 0.038, 0.458, 0.250, 0.234, 0.291, 0.036, 0.255, 0.133, 0.142, 0.257, 0.208, 0.255, 0.133, 0.144, 0		0.505 -0.105, 0.064,	0.312	0.376	0.240	0.177 -0.356, <mark>-0.429</mark> ,	-0.193 0.373, <mark>0.441</mark> ,	-0.082 0.234, 0.322,	-0.102 0.103, 0.098,	0.141	0.350
Preop SAS         0.5.0, 0.007, 0.560         0.100, 0.112, 0.390         0.241         0.390         0.336         0.305, 0.032, 0.366         0.013, 0.037, 0.037         0.011, 0.029         0.013, 0.297, 0.011         0.013, 0.297, 0.112, 0.002, 0.003, 0.123         0.011, 0.039, 0.027         0.013, 0.297, 0.027         0.0241         0.038, 0.363, 0.130         0.139         0.077, 0.027         0.002, 0.003, 0.027, 0.001, 0.012, 0.106, 0.012, 0.106         0.131           Post-op Active         -0.032, 0.211, 0.139         0.184, 0.304, 0.277         -0.025         0.441         0.386, 0.437, 0.388         0.347         0.063, 0.051, 0.055         0.052         -0.021, 0.106, 0.012, 0.106, 0.006           Post-op Active         -0.199, -0.173, 0.300         0.437, 0.004, -0.071, 0.037         0.038, 0.138, 0.020, 0.404, 0.021         0.038, 0.138, 0.039, 0.213, 0.139, 0.020         0.004         0.016         0.130         -0.0667         0.018, 0.012, 0.104, 0.016           Post-op Max Weight         0.159, 0.285, 0.312, 0.217, 0.132         0.341, 0.021, 0.021         0.041         0.042, 0.033, 0.194, 0.016, 0.171, 0.013, 0.184         0.113, 0.224, 0.023, 0.228, 0.033, 0.251, 0.324, 0.235, 0.257         0.033, 0.194, 0.259         0.033, 0.194, 0.113, 0.224, 0.016, 0.171, 0.0101, 0.180, 0.254 <td>Preop SPADI</td> <td>-0.338</td> <td>-0.320</td> <td>-0.150</td> <td>-0.337</td> <td>-0.305</td> <td>0.332</td> <td>0.146</td> <td>0.111</td> <td>-0.195</td> <td>-0.351</td>	Preop SPADI	-0.338	-0.320	-0.150	-0.337	-0.305	0.332	0.146	0.111	-0.195	-0.351
Post-op Active         -0.128, -0.299, 0.179         -0.011         0.013, 0.297, 0.011         0.013, 0.299, 0.299         0.013, 0.213, 0.188         0.114, 0.216, 0.139         -0.007, 0.172, 0.007         -0.002, -0.033, 0.007         0.173, 0.044, 0.027         -0.0406         0.181           Post-op Active         -0.022, 0.184, 0.131         0.127, -0.025         0.401         0.386, 0.437, 0.389         0.408, 0.400, 0.388         -0.347         0.048, 0.174, 0.055         -0.027, -0.061, 0.012, 0.105, 0.052         -0.121, 0.106, -0.121, 0.106, 0.121, 0.106, 0.022         -0.023, -0.134, 0.030         -0.234, -0.487, 0.030         -0.487, 0.055         0.048, 0.174, 0.055         -0.025         -0.025           Post-op IR Score         -0.032, -0.213, 0.300         0.370         -0.200, -0.417, 0.006         0.435         0.389         -0.397, 0.304         0.130         -0.067         -0.181, -0.29, 0.016         -0.124, -0.027, 0.304         -0.139         -0.130         -0.067         -0.181, -0.29, 0.016         -0.124, -0.027, 0.304         -0.130         -0.067         -0.181, -0.29, 0.016         -0.124, -0.027, -0.184, 0.016         -0.181, -0.29, 0.016         -0.192, -0.104, 0.016         -0.192, -0.104, 0.016         -0.192, -0.104, 0.016         -0.192, -0.104, 0.016         -0.192, -0.104, 0.016         -0.114, -0.024, -0.027, -0.328, 0.016         -0.192, -0.104, 0.016         -0.118, -0.294, 0.118         -0.016 <td< td=""><td>Preop SAS</td><td>0.253, =0.057, 0.560</td><td>0.245, 0.155, 0.395</td><td>0.241</td><td>0.390</td><td>0.315, <mark>0.400</mark>, 0.336</td><td>-0.367</td><td>-0.154</td><td>-0.063</td><td>0.039</td><td>0.257</td></td<>	Preop SAS	0.253, =0.057, 0.560	0.245, 0.155, 0.395	0.241	0.390	0.315, <mark>0.400</mark> , 0.336	-0.367	-0.154	-0.063	0.039	0.257
Post-op Active Forward Elevation         -0.022, 0.184, 0.131         0.184, 0.304, 0.277         -0.211, -0.029, -0.025         0.400, 0.499, 0.441         0.396         -0.408, 0.389         -0.284, -0.487, 0.388         0.048, 0.174, 0.055         -0.027, -0.061, 0.052         -0.121, 0.106, -0.025           Post-op IR Score         -0.032, -0.211, 0.300         0.159, 0.027, 0.300         -0.293, -0.336, 0.300         0.370         -0.060         0.438         0.389         -0.378, -0.189, 0.397         -0.0165, 0.063, 0.051, 0.308         -0.156, -0.351, 0.0667         -0.181, -0.293, 0.016           Post-op Active         -0.076         -0.027         -0.020, -0.147, 0.022         0.044, -0.071, 0.022         0.099, 0.045, 0.004         -0.014, -0.024, -0.102, 0.004         -0.075, -0.339, 0.234, 0.293, 0.234, 0.293, 0.245         0.303, 0.194, 0.257         0.113, 0.524, 0.257         0.303, 0.128         0.120, 0.106, 0.171, 0.010, 0.180, 0.257         0.210, 0.016, 0.171, 0.190, 0.234, 0.256         0.332, 0.290, 0.338, 0.266, 0.338, 0.266, 0.338, 0.266, 0.338, 0.256         0.348, 0.259, 0.338, 0.266, 0.351, 0.057, 0.060, 0.338, 0.256, 0.331, 0.150, 0.133, 0.312, 0.153, 0.0057, 0.066, 0.358, 0.257, 0.250 <td< td=""><td>Post-op Active Abduction</td><td>-0.128, -0.299, 0.179</td><td>-0.175, <mark>-0.510</mark>, 0.011</td><td>0.013, 0.297, 0.249</td><td>0.058, -0.363, 0.188</td><td>0.115, -0.213, 0.130</td><td>-0.141, 0.216, -0.139</td><td>0.007, 0.172, -0.077</td><td>-0.002, -0.003, 0.027</td><td>0.173, 0.044, <mark>0.406</mark></td><td>-0.043, -0.034, 0.181</td></td<>	Post-op Active Abduction	-0.128, -0.299, 0.179	-0.175, <mark>-0.510</mark> , 0.011	0.013, 0.297, 0.249	0.058, -0.363, 0.188	0.115, -0.213, 0.130	-0.141, 0.216, -0.139	0.007, 0.172, -0.077	-0.002, -0.003, 0.027	0.173, 0.044, <mark>0.406</mark>	-0.043, -0.034, 0.181
Post-op IR Score         -0.032, -0.211, 0.300         0.159, 0.027, 0.370         -0.293, -0.336, -0.060         0.332, 0.040, 0.435         0.378, -0.189, 0.389         -0.196, -0.155, -0.337         0.063, 0.051, 0.030         -0.156, -0.351, 0.067         -0.181, -0.293, 0.016           Post-op Active         -0.19, -0.173, -0.076         -0.027         -0.220, -0.147, -0.032         0.044, -0.071, 0.020         0.004         -0.015         0.044         0.166         -0.199, -0.153, -0.075, 0.339, -0.234, 0.233,         0.203, 0.287, -0.015         -0.192, -0.104, -0.108         -0.192, -0.104, -0.015         -0.015         0.044         0.016         -0.199, -0.173, -0.018         -0.192, -0.104, -0.018         -0.108         -0.128         -0.108         -0.476         -0.363         -0.119, -0.224,         -0.108         -0.128         -0.108         -0.128         -0.128 <td>Post-op Active Forward Elevation</td> <td>-0.022, 0.184, 0.131</td> <td>0.184, 0.304, 0.277</td> <td>-0.211, -0.029, -0.025</td> <td><mark>0.400, 0.499,</mark> <mark>0.441</mark></td> <td><mark>0.396</mark>, 0.437, 0.389</td> <td><mark>-0.408, -0.400</mark>, -0.388</td> <td>-0.284, -0.487, -0.347</td> <td>0.048, 0.174, 0.055</td> <td>-0.027, -0.061, 0.052</td> <td>-0.121, 0.106, -0.025</td>	Post-op Active Forward Elevation	-0.022, 0.184, 0.131	0.184, 0.304, 0.277	-0.211, -0.029, -0.025	<mark>0.400, 0.499,</mark> <mark>0.441</mark>	<mark>0.396</mark> , 0.437, 0.389	<mark>-0.408, -0.400</mark> , -0.388	-0.284, -0.487, -0.347	0.048, 0.174, 0.055	-0.027, -0.061, 0.052	-0.121, 0.106, -0.025
Post-op Active External Rotation         -0.199, -0.173, -0.076         -0.043, -0.057, -0.027         -0.220, -0.147, -0.032         0.044, -0.071, 0.020         -0.014, -0.024, -0.015         -0.024, -0.102, -0.044         -0.075, -0.339, 0.116         -0.203, -0.287, -0.139         -0.192, -0.104, -0.108           Post-op Max Weight Post-op Max Weight 0.154         0.159, 0.285, 0.312         0.381, 0.217, 0.449         -0.146, 0.265, 0.491         0.451, 0.297, 0.491         -0.443, -0.312, 0.441         -0.361         0.234, 0.293, 0.234, 0.293, 0.234, 0.293, 0.257         0.033, 0.194, 0.033, 0.194, 0.257         0.113, 0.524, 0.083         0.128           Post-op SST         -0.075, 0.098, 0.077, -0.077, 0.154         0.254         -0.249, 0.292, 0.234, 0.292, 0.234, 0.292, 0.303, 0.251, 0.459         0.372, 0.348, 0.4429         0.446         -0.348         0.257         0.083         0.128           Post-op Constant         0.049, -0.077, 0.356         0.429         0.453         -0.465         -0.348         0.259, 0.204, 0.205, 0.204,         0.000, -0.068, 0.000, -0.068, 0.214         -0.049, 0.184, 0.476         -0.363         0.322         0.201         0.078           Post-op LCA         0.055, 0.102, 0.250         0.060, 0.175, 0.224         -0.157, 0.124, 0.214         0.256, 0.028, 0.224, 0.014, 0.214         -0.266, -0.270, 0.234, 0.014, 0.258         -0.057, 0.040, 0.318, 0.058         -0.037, 0.042, 0.037, 0.042, 0.031, 0.084, 0.031, 0.084,	Post-op IR Score	-0.032, -0.211, 0.300	0.159, 0.027, 0.370	-0.293, -0.336, -0.060	0.302, 0.040, <mark>0.435</mark>	0.353, 0.187, 0.389	-0.378, -0.189, -0.397	-0.196, -0.155, -0.304	0.063, 0.051, 0.130	-0.156, -0.351, -0.067	-0.181, -0.293, 0.016
Post-op Max Weight         0.159, 0.285, 0.312         0.381, 0.217, 0.449         -0.146, 0.265, -0.21         0.518, 0.313, 0.491         0.451, 0.297, 0.411         -0.453, -0.213, -0.414         -0.395, 0.395, -0.361         0.234, 0.293, 0.257         0.033, 0.194, 0.083         0.113, 0.524, 0.083           Post-op SST         -0.075, 0.098, 0.154         0.077, -0.077, 0.154         -0.219, 0.292, 0.303, 0.251, 0.429         0.330, 0.251, 0.453         0.372, 0.348, 0.453         -0.402, -0.335, 0.465         0.119, 0.224, 0.453         0.019, -0.337, 0.456         0.119, 0.224, 0.259         0.016, 0.171, 0.016, 0.171, 0.016, 0.184, 0.080         -0.101, 0.180, 0.050, -0.290, 0.338, 0.250, 0.204, 0.033, 0.251, 0.465         0.3465         0.348, 0.259         0.010, 0.068, 0.006, -0.175, 0.000, 0.068, -0.049, 0.184, 0.078           Post-op Constant         0.356, 0.360, 0.356         0.459         0.138, 0.521         0.463         0.476         -0.363         0.323, 0.204, 0.318         0.0010         0.078           Post-op ASES         -0.095, -0.102, 0.250         0.060, -0.175, 0.294         -0.100         0.214         0.258         -0.275         -0.150         0.318         0.058         0.050           Post-op UCLA         -0.083, -0.080, 0.214         0.184, 0.297, 0.214         0.228, 0.212, 0.236, 0.152, 0.226, 0.152,         0.097, -0.343, 0.057, 0.046, 0.216         -0.025         -0.025         -0.0516         0.0	Post-op Active External Rotation	-0.199, -0.173, -0.076	-0.043, -0.057, -0.027	-0.220, -0.147,	0.044, -0.071,	0.099, 0.045,	-0.114, -0.024, -0.015	-0.024, -0.102, 0.044	-0.075, -0.339, 0.116	-0.203, -0.287, -0.139	-0.192, -0.104, -0.108
Post-op SST         -0.075, 0.098, 0.154         0.077, -0.077, 0.254         -0.219, 0.292, -0.035         0.332, 0.251, 0.429         0.332, 0.348, 0.453         -0.402, -0.335, -0.465         -0.194, -0.337, -0.348         0.119, 0.224, 0.259         0.016, 0.171, 0.113         -0.101, 0.180, 0.080           Post-op Constant         0.049, -0.077, 0.356         0.322, 0.170, 0.459         -0.227, -0.128, 0.138         0.536, 0.380, 0.521         0.463         -0.402, -0.335, -0.465         -0.348         0.259         0.016, 0.171, 0.013         -0.0049, 0.184, 0.080           Post-op Constant         0.049, -0.077, 0.356         0.322, 0.170, 0.459         -0.227, -0.128, 0.138         0.521         0.463         -0.476         -0.363         0.223, 0.223         0.000, -0.068, 0.007, -0.026, 0.078         -0.010         0.078           Post-op ASES         -0.095, -0.102, 0.250         0.069, 0.109, 0.294         -0.167, 0.127, 0.214         0.234, 0.014, 0.214         -0.269, -0.038, 0.275         -0.057, 0.060, 0.013, 0.084         -0.150, 0.133, 0.058           Post-op UCLA         -0.083, -0.080, 0.214         0.176         0.236, 0.229, 0.234, 0.297,         -0.286, -0.277, 0.206         -0.210         -0.166         0.490         0.216         -0.025           Post-op SPADI         0.156, 0.063, -0.047         -0.170, 0.199, 0.122         0.283, 0.232, 0.335         -0.378         0.397	Post-op Max Weight	0.159, 0.285, 0.312	0.381, 0.217, 0.449	-0.146, 0.265, -0.021	<mark>0.518</mark> , 0.313, 0.491	<mark>0.451</mark> , 0.297, 0.411	- <mark>0.453</mark> , -0.213, -0.414	-0.379, <mark>-0.395</mark> , -0.361	0.234, 0.293, 0.257	0.033, 0.194, 0.083	0.113, 0.524, 0.128
0.154         0.254         -0.035         0.429         0.439         0.430         -0.348         0.259         0.113         0.080           Post-op Constant         0.049, 0.077, 0.355         0.352, 0.170, 0.459         -0.227, -0.128, 0.459         0.536, 0.380, 0.453         0.440         -0.548         0.259         0.013         0.080           Post-op Constant         0.355         0.459         0.138         0.521         0.463         -0.476         -0.363         0.323         0.201         0.078           Post-op ASES         -0.095, -0.102, 0.250         0.060, -0.175, 0.294         -0.055, 0.179, -0.010         0.166, -0.109, 0.214         0.284, 0.014, 0.258         -0.269, -0.038, -0.275         -0.050, 0.031, 0.025, 0.318         -0.037, 0.042, 0.031, 0.084, 0.058         -0.150, 0.133, 0.058           Post-op UCLA         -0.083, -0.080, 0.211         0.142         0.176         0.206         -0.210         -0.166         0.490         0.216         -0.025           Post-op SPADI         0.156, 0.063, -0.047         -0.017, 0.199, 0.122         0.286, 0.152, -0.335         0.321, 0.126, -0.206         -0.210         0.166         0.490         0.216         -0.025           Post-op SPADI         0.156, 0.063, -0.047         -0.017, 0.199         0.283, 0.239, -0.211, 0.006, -0.226         -0.378	Post-op SST	-0.075, 0.098,	0.077, -0.077,	-0.219, 0.292,	0.303, 0.251,	0.372, 0.348,	-0.402, -0.335,	-0.194, -0.337,	0.119, 0.224,	0.016, 0.171,	-0.101, 0.180,
Outside         0.356         0.455         0.138         0.521         0.465         -0.4470         -0.363         0.323         0.201         0.0078           Post-op ASES         -0.095, 0.102, 0.250         0.060, 0.175, 0.294         -0.255, 0.179, -0.010         0.166, 0.109, 0.214         0.234, 0.014, 0.258         -0.269, 0.038, -0.275         -0.057, 0.060, 0.318         0.037, 0.026, 0.318         -0.150, 0.037, 0.042, 0.338         -0.150, 0.038, 0.050         -0.057, 0.050, 0.318         0.050, 0.038, 0.050         -0.057, -0.150, 0.318         0.031, -0.084, 0.031, -0.084, 0.216         -0.166, 0.109, 0.216         -0.025         -0.025         -0.025           Post-op UCLA         0.156, 0.063, -0.211         0.142         0.176         0.206         -0.210         -0.166         0.490         0.216         -0.025           Post-op SPADI         0.156, 0.063, -0.047         -0.017, 0.199, -0.047         0.283, -0.239, 0.122         -0.335         -0.378         0.397         0.100, 0.126, -0.024         -0.037, -0.106, 0.013, -0.181, 0.013, -0.181, 0.013, -0.181, 0.009         0.017, -0.125, -0.029           Post-op SAS         -0.052, -0.209, 0.145, 0.035, -0.259, -0.281, 0.245, 0.322, 0.338, 0.266, -0.364, -0.235, 0.388, 0.266, -0.364, -0.235, 0.181, -0.324, 0.066, -0.200, 0.081, -0.371, -0.157, -0.127,         -0.051, -0.301, -0.099         -0.157, -0.127, -0.150	Post-op Constant	0.154	0.254	-0.035	0.429 0.536, 0.380,	0.453 0.484, 0.341,	-0.465 -0.503, -0.290,	-0.348	0.259	0.113	-0.049, 0.184,
Outcome         Outcome <t< td=""><td>Post-op ASES</td><td>-0.095, -0.102,</td><td>0.060, -0.175,</td><td>-0.255, 0.179,</td><td>0.166, -0.109,</td><td>0.234, 0.014,</td><td>-0.269, -0.038,</td><td>-0.363</td><td>0.323</td><td>-0.037, 0.042,</td><td>-0.150, 0.133,</td></t<>	Post-op ASES	-0.095, -0.102,	0.060, -0.175,	-0.255, 0.179,	0.166, -0.109,	0.234, 0.014,	-0.269, -0.038,	-0.363	0.323	-0.037, 0.042,	-0.150, 0.133,
O.211         O.213         O.214         O.170         O.206         -0.210         -0.166         O.490         O.216         -0.025           Post-op SPADI         0.156, 0.063, -0.047         -0.017, 0.199, -0.059         0.283, -0.239, 0.122         -0.210, 0.026         -0.166         0.490         0.216         -0.027, -0.126         -0.037, -0.106, 0.013, -0.181,         0.107, -0.125, -0.099         -0.171           Post-op SAS         -0.052, -0.209,         0.145, 0.035, -0.259, -0.281,         0.282, 0.132, 0.282, 0.132,         0.338, 0.266, -0.364, -0.235,         -0.181, -0.324, -0.181, -0.324,         0.066, -0.200, 0.061, -0.371,         -0.157, -0.127, -0.157, -0.127,	Post-op UCLA	-0.083, -0.080,	0.294	-0.198, -0.157,	0.182, 0.297,	0.238, 0.320,	-0.275	-0.150	0.168, -0.218,	0.031, -0.084,	-0.167, 0.112,
-0.047         -0.159         0.122         -0.355         -0.378         0.397         0.247         -0.150         -0.099         -0.171           Post-op SAS         -0.052, -0.209,         0.145, 0.035,         -0.259, -0.281,         0.282, 0.132,         0.338, 0.266,         -0.364, -0.235,         -0.181, -0.324,         0.066, -0.200,         -0.081, -0.371,         -0.157, -0.127,	Post-op SPADI	0.211	-0.017, 0.199,	0.142	-0.211, 0.006,	-0.286, -0.152,	-0.210	-0.166	-0.037, -0.106,	0.216	-0.025
	Post-op SAS	-0.052, -0.209,	0.145, 0.035,	-0.259, -0.281,	0.282, 0.132,	0.338, 0.266,	-0.364, -0.235,	-0.181, -0.324,	0.066, -0.200,	-0.081, -0.371,	-0.171