

The following content was supplied by the authors as supporting material and has not been copy-edited or verified by JBJS.

Appendix I. Principal Strain, No Capsulotomy/Osteotomy to Capsulotomy/Osteotomy

Abduction Angle	No Capsulotomy/Osteotomy (mm/mm, n=9)	Capsulotomy/Osteotomy (mm/mm, n=9)	p-value
0°	0.019 ± 0.012	0.019 ± 0.008	0.912
30°	0.020 ± 0.011	0.023 ± 0.017	0.746

Appendix II. Shoulder Abduction Force, No Capsulotomy/Osteotomy to

Capsulotomy/Osteotomy

Abduction Angle	No Capsulotomy/Osteotomy (N, n=9)	Capsulotomy/Osteotomy (N, n=9)	p-value
0°	27.65 ± 20.14	20.56 ± 13.37	0.391
30°	7.53 ± 4.01	9.41 ± 2.11	0.231

Appendix III. A Priori Sample Size Analysis

Tendon Location	Cable Condition	Average Strain	Standard Deviation	Power	Total Sample Size
Crescent	Intact Tendon	0.05	0.005	95%	6
	Small Cable Tear	0.06	0.005		

Appendix IV A. Raw Data Principal Strain Magnitude in the RCa and CA

Specimen #	Group	Native Strain (mm/mm)		Single Release Strain (mm/mm)		Full Release Strain (mm/mm)	
		0°	30°	0°	30°	0°	30°
1	Anterior	1.76E-02	6.36E-03	4.02E-03	2.95E-03	4.14E-03	3.63E-03
2	Anterior	9.08E-03	1.67E-02	2.15E-02	2.14E-02	1.55E-02	1.49E-02
3	Anterior	7.95E-03	7.69E-03	4.13E-02	5.23E-03	8.21E-03	1.25E-02
4	Anterior	3.44E-02	3.99E-02	2.31E-02	2.81E-02	2.03E-02	4.53E-02
5	Anterior	1.53E-02	2.00E-02	2.26E-02	1.45E-02	1.46E-02	1.10E-02
6	Anterior	4.88E-03	1.52E-02	4.61E-03	2.66E-02	7.45E-03	2.34E-02
7	Anterior	9.68E-03	1.16E-02	1.44E-02	7.99E-03	1.24E-02	9.79E-03
8	Anterior	1.47E-02	2.07E-02	1.90E-02	1.72E-02	1.55E-02	1.51E-02
9	Anterior	9.96E-03	1.04E-02	1.19E-02	1.16E-02	1.11E-02	1.02E-02
10	Posterior	1.65E-02	3.57E-02	1.71E-02	1.59E-02	2.57E-02	1.17E-02
11	Posterior	2.64E-02	5.41E-02	3.00E-02	4.46E-02	3.23E-02	4.46E-02
12	Posterior	2.32E-02	1.13E-02	2.71E-02	1.43E-02	2.54E-02	1.53E-02
13	Posterior	1.76E-02	1.22E-02	5.27E-02	1.22E-02	1.43E-02	8.34E-03
14	Posterior	8.58E-03	1.15E-02	8.53E-03	6.16E-03	8.62E-03	1.09E-02
15	Posterior	5.75E-03	6.91E-03	7.19E-03	6.02E-03	6.19E-03	5.04E-03
16	Posterior	1.37E-02	2.33E-02	1.24E-02	2.46E-02	1.27E-02	2.42E-02
17	Posterior	1.04E-02	1.38E-02	8.46E-03	1.56E-02	1.05E-02	1.58E-02
18	Posterior	1.23E-02	1.49E-02	8.54E-03	2.48E-02	7.07E-03	2.86E-02

Appendix IV B. Raw Data Principal Strain Direction in the RCa and CA

Anterior-First Release, 0° Abduction						
Specimen #	RCa Release State					
	Native		Single		Full	
	RCa	CA	RCa	CA	RCa	CA
3	112.9°	243.2°	245.2°	235.3°	256.1°	249.0°
8	228.1°	170.7°	240.9°	258.1°	247.3°	246.6°
5	260.9°	149.0°	114.2°	142.3°	193.6°	126.8°
2	246.2°	233.0°	243.0°	222.6°	247.4°	226.3°
10	100.2°	220.9°	194.8°	247.9°	134.4°	252.5°
11	100.0°	115.4°	232.9°	183.6°	262.1°	262.7°
13	247.1°	260.0°	246.1°	259.2°	240.7°	245.4°
15	98.1°	114.2°	210.7°	227.5°	253.2°	204.5°
17	234.2°	222.1°	237.0°	201.7°	234.2°	237.2°
Anterior-First Release, 30° Abduction						
3	256.5°	247.3°	259.0°	251.0°	240.2°	257.4°
8	213.9°	138.2°	239.1°	124.2°	128.5°	227.8°
5	258.6°	220.9°	257.5°	198.7°	222.8°	257.5°
2	253.2°	232.1°	259.7°	229.7°	228.7°	256.5°
10	102.8°	180.6°	97.8°	99.1°	102.9°	102.9°
11	250.6°	238.8°	193.9°	252.7°	233.1°	117.7°
13	238.0°	254.0°	240.1°	251.9°	248.3°	230.5°

15	96.2°	178.7°	250.0°	119.0°	105.3°	102.8°
17	235.9°	244.9°	236.5°	248.0°	N/A	N/A

Posterior-First Release, 0° Abduction						
Specimen #	RCa Release State					
	Native		Single		Full	
	RCa	CA	RCa	CA	RCa	CA
1	180.7°	209.1°	228.1°	123.4°	179.4°	118.6°
6	193.8°	174.5°	200.6°	204.9°	179.4°	215.3°
4	107.2°	99.3°	123.4°	205.5°	121.9°	178.0°
7	241.3°	248.5°	250.6°	255.0°	254.7°	183.7°
9	126.9°	135.3°	113.7°	102.5°	111.6°	98.6°
12	250.1°	251.9°	236.8°	252.0°	240.3°	248.8°
14	235.4°	234.9°	240.8°	238.9°	228.1°	221.6°
16	262.0°	247.3°	181.9°	229.1°	246.1°	240.0°
18	248.2°	241.9°	222.7°	224.4°	237.3°	240.3°
Posterior-First Release, 30° Abduction						
1	260.9°	101.7°	265.3°	234.2°	247.9°	113.1°
6	225.6°	258.4°	94.7°	263.6°	180.1°	243.8°
4	179.9°	261.5°	259.0°	254.9°	257.3°	248.0°
7	241.3°	239.8°	246.0°	237.4°	243.4°	237.3°
9	113.1°	104.2°	120.7°	172.6°	111.6°	161.6°
12	240.7°	259.5°	250.7°	259.1°	246.4°	258.9°
14	243.7°	254.4°	249.3°	255.0°	245.5°	251.3°

16	186.9°	127.3°	113.5°	116.1°	122.6°	124.9°
18	251.0°	258.2°	234.0°	263.2°	247.8°	259.2°

Appendix V. Raw Data Shoulder Abduction Force

Specimen #	Group	Native Abduction Force (N)		Single Release Abduction Force (N)		Full Release Abduction Force (N)	
		0°	30°	0°	30°	0°	30°
1	Anterior	37.61	13.28	40.54	12.91	39.35	13.42
2	Anterior	17.38	7.60	25.65	8.25	20.85	11.13
3	Anterior	28.09	9.67	36.06	4.11	48.59	8.98
4	Anterior	37.88	10.87	32.42	7.63	34.43	10.78
5	Anterior	19.84	7.40	31.42	8.04	36.68	8.70
6	Anterior	8.51	4.10	23.65	4.62	23.22	7.51
7	Anterior	18.52	4.75	17.02	4.16	23.27	4.28
8	Anterior	16.06	8.54	24.08	10.93	27.57	10.30
9	Anterior	17.95	15.29	17.50	16.19	19.87	14.83
10	Posterior	2.93	9.39	8.34	7.90	7.66	9.55
11	Posterior	28.37	6.91	25.79	9.28	31.14	6.51
12	Posterior	5.41	8.25	2.75	9.26	8.34	8.39
13	Posterior	7.53	11.35	7.42	9.48	9.81	9.16
14	Posterior	19.11	6.72	26.72	6.61	23.76	9.75
15	Posterior	5.58	3.17	4.74	4.46	4.67	4.54
16	Posterior	9.28	5.67	11.61	5.30	12.71	4.24
17	Posterior	21.38	6.41	25.96	6.77	27.87	6.31
18	Posterior	18.31	6.67	28.08	-0.05	28.31	1.06

Appendix VI. Raw Data RCa and CA thicknesses

Specimen #	Group	Anterior Thickness (mm)		Center Thickness (mm)		Posterior Thickness (mm)	
		RCa	CA	RCa	CA	RCa	CA
1	Anterior	4.084	2.479	3.521	4.028	4.254	5.865
2	Anterior	7.710	4.964	5.103	4.599	5.599	6.835
3	Anterior	2.234	2.399	6.765	4.981	7.337	4.388
4	Anterior	7.238	4.091	6.870	3.820	6.025	4.653
5	Anterior	3.815	2.412	3.723	2.078	3.682	2.309
6	Anterior	6.841	5.677	5.143	4.616	5.377	6.900
7	Anterior	5.356	7.381	5.283	6.503	4.983	4.476
8	Anterior	4.251	4.041	4.211	3.941	6.502	5.399
9	Anterior	7.138	6.967	7.942	7.723	5.734	6.177
10	Posterior	5.739	4.125	4.350	3.356	5.029	4.435
11	Posterior	10.151	7.024	9.664	9.398	10.696	10.444
12	Posterior	6.018	6.738	5.900	7.724	5.780	7.087
13	Posterior	2.925	4.028	7.593	7.514	8.214	7.560
14	Posterior	9.628	8.769	8.262	7.958	11.212	12.604
15	Posterior	9.052	8.633	5.659	4.680	9.419	8.342
16	Posterior	5.128	7.196	5.644	6.291	7.326	10.831
17	Posterior	11.171	4.458	11.148	8.910	11.531	8.159
18	Posterior	6.182	5.129	5.195	4.740	5.143	5.106

Appendix VII. RCa and CA Measurements Raw Data

Location	Specimen Ages	Anterior (mm)		Center (mm)		Posterior (mm)		Combined (mm)	
Specimen #		RCa	CA	RCa	CA	RCa	CA	RCa	CA
1	74	3.52	4.03	4.25	5.87	4.08	2.48	3.95	4.12
2	63	5.10	4.60	5.60	6.84	7.71	4.96	6.14	5.47
3	94	6.77	4.98	7.34	4.39	2.23	2.40	5.45	3.92
4	84	6.87	3.82	6.03	4.65	7.24	4.09	6.71	4.19
5	89	3.72	2.08	3.68	2.31	3.82	2.41	3.74	2.27
6	64	5.14	4.62	5.38	6.90	6.84	5.68	5.79	5.73
7	73	5.28	6.50	4.98	4.48	5.36	7.38	5.21	6.12
8	82	4.21	3.94	6.50	5.40	4.25	4.04	4.99	4.46
9	83	7.94	7.72	5.73	6.18	7.14	6.97	6.94	6.96
10	36	4.35	3.36	5.03	4.44	5.74	4.13	5.04	3.97
11	66	9.66	9.40	10.70	10.44	10.15	7.02	10.17	8.96
12	66	5.90	7.72	5.78	7.09	6.02	6.74	5.90	7.18
13	23	7.59	7.51	8.21	7.56	2.93	4.03	6.24	6.37
14	69	8.26	7.96	11.21	12.60	9.63	8.77	9.70	9.78
15	59	5.66	4.68	9.42	8.34	9.05	8.63	8.04	7.22
16	69	5.64	6.29	7.33	10.83	5.13	7.20	6.03	8.11
17	58	11.15	8.91	11.53	8.16	11.17	4.46	11.28	7.18
18	58	5.20	4.74	5.14	5.11	6.18	5.13	5.51	4.99

Appendix VIII. RCa and CA Descriptive Parameters Raw Data

Parameters	RCa Width (mm)	CA Inside AP Diameter (mm)	CA Mediolateral Diameter (mm)	RCa Area (mm ²)	CA Area (mm ²)
Specimen #					
1	3.91	35.60	16.97	456.85	523.91
2	7.67	42.25	11.87	443.00	293.98
3	13.65	32.52	10.54	761.00	313.96
4	8.64	35.35	10.55	618.16	354.84
5	8.67	34.21	8.21	446.29	292.04
6	7.68	39.19	24.45	604.73	746.71
7	7.12	32.68	12.77	305.44	369.14
8	5.36	37.67	9.91	415.62	554.36
9	6.49	50.80	29.93	556.83	880.38
10	12.19	38.05	18.56	701.08	449.70
11	7.99	41.53	18.40	481.37	232.31
12	7.47	52.13	20.64	623.25	624.18
13	3.06	53.33	17.83	400.76	628.89
14	8.48	50.22	20.67	481.99	515.60
15	7.94	46.53	16.54	409.48	515.89
16	8.45	42.05	17.83	653.77	504.15
17	8.01	39.58	24.47	458.06	441.30
18	3.92	43.95	26.19	698.67	501.31