

## Appendix 3

**Table A1** Demographic data of athletes included in the analysis at the three return to sport milestones.

	Completed clinically pain free criteria (n=61)	Completed controlled sports training (n=50)	Returned to full team training (n=75)	Lost to follow-up (n=6)
<b>Age (y)</b>	26.2 (4.3), 20-37	26.4 (4.5), 20-37	25.9 (4.3), 18-37	23.2 (3.6), 18-28
<b>Height (cm)</b>	180.8 (9.5), 162-210	180.9 (9.2), 162-203	180.0 (9.0), 162-210	175.5 (5.2), 169-184
<b>Weight (kg)</b>	79.1 (14.1), 47-115	78.9 (13.4), 47-108	78.2 (13.8), 47-115	70.3 (8.9), 60-84
<b>BMI (kg/m<sup>2</sup>)</b>	24.0 (2.8), 18-37	23.9 (2.4), 18-31	24.0 (2.8), 18-37	22.8 (2), 19-25
<b>Sport</b>				
Football	35 (57%)	29 (58%)	43 (57%)	4 (67%)
Futsal	12 (20%)	11 (22%)	16 (21%)	2 (33%)
Handball	4 (7%)	4 (8%)	5 (7%)	-
Volleyball	4 (7%)	2 (4%)	5 (7%)	-
Basketball	4 (7%)	4 (8%)	4 (5%)	-
Shot put	1 (2%)	-	1 (1%)	-
Table tennis	1 (2%)	-	1 (1%)	-
<b>Primary MRI injury location</b>				
Grade 0	<u>12 (20%)</u>	<u>9 (18%)</u>	<u>13 (17%)</u>	<u>1 (17%)</u>
Grade 1	<u>16 (26%)</u>	<u>13 (26%)</u>	<u>18 (24%)</u>	<u>2 (33%)</u>
- Adductor longus	11 (18%)	9 (18%)	13 (17%)	1 (17%)
- Adductor brevis	2 (3%)	2 (4%)	2 (3%)	1 (17%)
- Adductor magnus	1 (2%)	1 (2%)	1 (1%)	-
- Pectineus	1 (2%)	-	1 (1%)	-
- Obturator externus	1 (2%)	1 (2%)	1 (1%)	-
Grade 2	<u>20 (33%)</u>	<u>16 (32%)</u>	<u>28 (37%)</u>	<u>2 (33%)</u>
- Adductor longus	18 (30%)	15 (30%)	26 (35%)	1 (17%)
- Adductor brevis	-	-	-	-
- Adductor magnus	-	-	-	-
- Pectineus	1 (2%)	-	1 (1%)	-
- Obturator externus	1 (2%)	1 (2%)	1 (1%)	1 (17%)
Grade 3	<u>13 (21%)</u>	<u>12 (24%)</u>	<u>16 (21%)</u>	<u>1 (17%)</u>
- Adductor longus	13 (21%)	12 (24%)	16 (21%)	1 (17%)

Data reported as mean (SD), range, and number (%) of athletes.

**Table A2** Clinical measures of self-reported disability (five HAGOS subscales), pain provocation tests, and strength and range of motion at initial examination (baseline) and on the day of completion of the controlled sports training prior to first full team training (n=50, grade 0-2: n=38, grade 3: n=12). Only athletes who completed the controlled sports-specific training are included in this overview.

	Initial examination				Completed controlled sports training			
	<i>n</i>	Grade 0-2 adductor injuries	<i>n</i>	Grade 3 adductor injuries	<i>n</i>	Grade 0-2 adductor injuries	<i>n</i>	Grade 3 adductor injuries
<b>HAGOS Pain</b> (0-100)	36	80 [70-93], 20-100	12	48 [35-68], 33-80	36	100 [98-100], 80-100	11	100 [98-100], 80-100
<b>HAGOS Symptoms</b> (0-100)	36	71 [52-82], 14-93	12	39 [20-50], 0-68	36	100 [96-100], 75-100	11	89 [82-95], 68-100
<b>HAGOS ADL</b> (0-100)	36	83 [68-90], 30-100	12	50 [23-75], 10-80	36	100 [100-100], 80-100	11	100 [98-100], 80-100
<b>HAGOS Sport</b> (0-100)	36	58 [39-77], 9-100	12	31 [14-45], 6-53	36	100 [100-100], 69-100	11	97 [81-98], 63-100
<b>HAGOS QOL</b> (0-100)	36	70 [53-88], 20-100	12	40 [25-60], 10-85	36	100 [93-100], 35-100	11	85 [68-100], 25-100
<b>Adductor palpation pain</b> (y/n)	38	38 (100%)	12	12 (100%)	38	2 (5%)	12	1 (8%)
<b>Adductor resistance pain</b> (y/n)	38	34 (89%)	12	12 (100%)	38	2 (5%)	12	2 (17%)
<b>Adductor stretch pain</b> (y/n)	38	22 (58%)	12	12 (100%)	38	0 (0%)	12	0 (0%)
<b>Bent Knee Fall Out</b>	38		11		37		12	
- LSI (%)		94 (27), 11-140		48 (26), 10-94		99 (19), 73-146		101 (14), 77-120
• injured leg (cm)		17 [13-21], 5-39		32 [25-36], 17-40		15 [13-17], 4-27		13 [11-15], 4-19
• uninjured leg (cm)		15 [12-20], 4-32		14 [12-15], 4-16		15 [13-18], 4-27		15 [10-16], 4-18
<b>Hip Abduction ROM</b>	38		10		37		12	
- LSI (%)		88 (22), 42-133		61 (27), 8-92		102 (8), 82-117		99 (6), 93-117
• injured leg (°)		37 (10), 23-58		30 (13), 4-52		47 (8), 30-67		49 (7), 39-67
• uninjured leg (°)		43 (10), 20-68		49 (6), 41-58		46 (9), 30-69		49 (7), 39-67
<b>Eccentric strength ability</b> (y/n)	35	25 (71%)	12	3 (25%)	37	37 (100%)	12	12 (100%)
<b>Eccentric adduction strength</b>								
<b>Side-lying</b>	25		3		37		12	
- LSI (%)		73 (19), 23-104		34, 23-111		97 [91-106], 80-129		95 [82-98], 56-110
• injured leg (Nm/kg)		2.2 (0.8), 0.5-3.8		0.9, 0.6-3.0		3.4 [3.0-3.9], 2.5-4.8		2.9 [2.4-3.2], 2.0-4.1
• uninjured leg (Nm/kg)		3.0 (0.5), 2.1-4.2		2.7, 2.5-2.8		3.4 [3.1-3.8], 2.4-4.8		3.1 [2.7-3.5], 2.0-4.3

<b>Eccentric abduction strength</b>						
<b>Side-lying</b>	25	3	37	12		
- LSI (%)	95 (17), 64-128	85, 81-88	98 [92-110], 67-134	101 [94-116], 83-122		
• injured leg (Nm/kg)	2.5 (0.7), 1.0-3.7	2.7, 2.4-3.0	2.8 [2.4-3.3], 1.7-3.8	3.0 [2.7-3.2], 2.2-3.8		
• uninjured leg (Nm/kg)	2.7 (0.6), 1.6-4.0	3.2, 2.9-3.4	2.9 [2.4-3.2], 1.8-4.0	2.7 [2.6-3.1], 2.4-3.9		
<b>ADD/ABD ratio</b>	25	3	37	12		
- injured leg	0.88 (0.25), 0.45-1.28	0.38, 0.19-1.10	1.24 [1.1-1.31], 0.82-1.81	0.96 [0.84-1.10], 0.69-1.25		
- uninjured leg	1.17 (0.25), 0.63-1.54	0.81, 0.73-0.96	1.22 [1.06-1.48], 0.78-2.19	1.06 [1.02-1.22], 0.77-1.41		
<b>Eccentric adduction strength</b>						
<b>Supine</b>			37	12		
- LSI (%)	n.a.	n.a.	105 (13), 78-135	80 (17), 47-105		
• injured leg (Nm/kg)			3.2 (0.7), 2.0-4.7	2.3 (0.5), 1.6-3.1		
• uninjured leg (Nm/kg)			3.1 (0.6), 1.8-4.4	2.9 (0.5), 2.0-3.8		

HAGOS = Copenhagen Hip And Groin Outcomes Score, ADL = Activities of daily living, QOL = Quality of life, ROM = Range of motion, ADD = Adduction, ABD = Abduction. n.a. = not applicable. Missing data: Two players (grade 0-2) did not complete the HAGOS questionnaire at both time points, and one (grade 3) did not complete the questionnaire at discharge. Two players (grade 3) did not perform the hip abduction range of motion, and one player (grade 3) did not perform the BKFO test, due to pain in the initial examination. Three players (grade 0-2) were not able to perform the strength tests in the initial examination due to device malfunction. One player (grade 0-2) did not perform range of motion and strength tests at completion of treatment. Eccentric strength measures are only reported for athletes who were able to perform the eccentric adduction test.

**Table A3** Subsequent groin pain grouped for athletes with MRI grade 0-2 and grade 3 injuries, according to the RTS milestones and time after return to sport.

Subsequent injuries	Returned to full team training	Completed controlled sports training	Did not complete controlled sports training	Clinically pain free	Did not complete clinical pain free criteria
<b>Grade 0-2 adductor injuries</b>	n = 59	n = 38	n = 21	n = 48	n = 11
Re-injury					
- 0-2m	4/58 (7%)	1/38 (3%)	3/20 (15%)	1/47 (2%)	3/11 (27%)
- 0-6m	5/57 (9%)	2/37 (5%)	3/20 (15%)	2/46 (4%)	3/11 (27%)
- 0-12m	5/56 (9%)	2/36 (6%)	3/20 (15%)	2/45 (4%)	3/11 (27%)
Other groin pain					
- 0-2m	8/58 (14%)	6/38 (16%)	2/20 (10%)	7/47 (15%)	1/11 (9%)
- 0-6m	10/57 (18%)	7/37 (19%)	3/20 (15%)	9/46 (20%)	1/11 (9%)
- 0-12m	12/56 (21%)	7/36 (19%)	5/20 (25%)	10/45 (22%)	2/11 (18%)
<b>Grade 3 adductor injuries</b>	n = 16	n = 12	n = 4	n = 13	n = 3
Re-injury					
- 0-2m	1/16 (6%)	1/12 (8%)	0/4 (0%)	1/13 (8%)	0/3 (0%)
- 0-6m	1/16 (6%)	1/12 (8%)	0/4 (0%)	1/13 (8%)	0/3 (0%)
- 0-12m	1/16 (6%)	1/12 (8%)	0/4 (0%)	1/13 (8%)	0/3 (0%)
Other groin pain					
- 0-2m	2/16 (13%)	1/12 (8%)	1/4 (25%)	1/13 (8%)	1/3 (33%)
- 0-6m	3/16 (19%)	2/12 (17%)	1/4 (25%)	2/13 (15%)	1/3 (33%)
- 0-12m	3/16 (19%)	2/12 (17%)	1/4 (25%)	2/13 (15%)	1/3 (33%)

*Data presented as number of subsequent injuries/number of athletes contacted at the respective time point, and reported as accumulative numbers.*

*Missing data: Three players could not be contacted for follow-up at one or more time points within 12m after return to sport as they moved to different countries.*