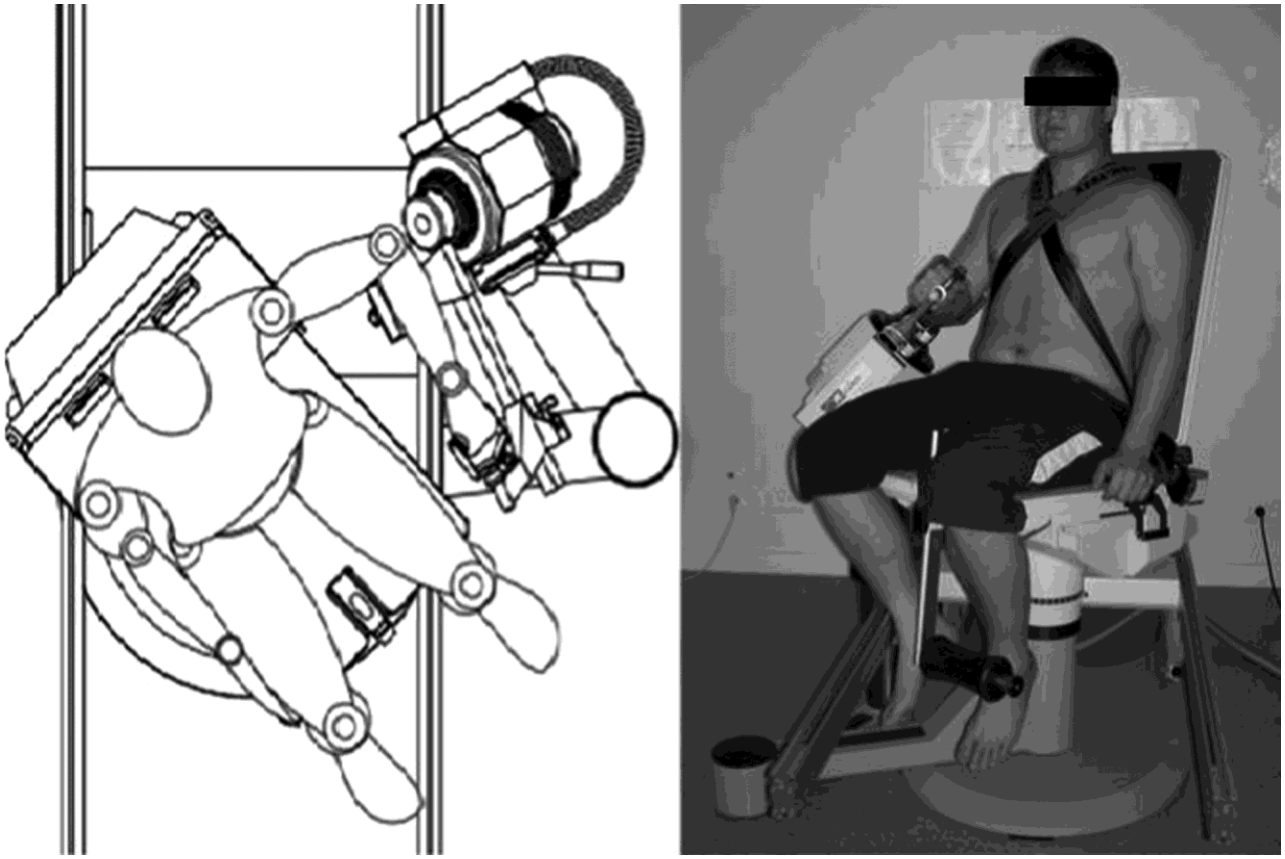

Fig. E-1
Isokinetic testing of the internal rotator and external rotator muscles of the shoulder with the subject in a seated position and 45° of shoulder abduction in the scapular plane with use of an isokinetic Con-Trex dynamometer.

TABLE E-1 Literature Review of Studies on Rotator Strength in Patients with Nonoperatively Treated Anterior Shoulder Instability

	Population				Procedure of Isokinetic Testing*				Conclusions	
Study	No. of Patients and Type of Abnormality	Sex (F/M)	Mean Age (Range) *(yr)*	Involved Shoulder (Dominant/Nondominant)	Type of Dynamometer†	Position	Angular Speeds; Contraction Modes	Measures	Comparisons of Isokinetic Strength	Results
Bak and Magnussen[15] (1997)	7 swimmers with unilateral instability and shoulder pain and 8 asymptomatic healthy swimmers	3/4 with instability, and 3/5 without symptoms	18.5 (15-25)		KinCom	Seated position, with shoulder in 80° of abduction in the frontal plane	30°/s; conc. and ecc.	IR, ER, and ER/IR ratio	Side-to-side and between-group differences	No significant difference
Dauty et al.[9] (2007)	25 patients with nonoperatively treated anterior posttraumatic unidirectional recurrent shoulder dislocation	5/20	23 ± 6‡	17/8	Cybex Norm	Seated position in scapular plane	60°/s and 120°/s; conc. and ecc.	IR and ER	Side-to-side differences	No significant difference in IR and ER; significant difference in ER/IR ratio
Ide et al.[14] (2003)	46 patients with involuntary multidirectional shoulder instability; 73 pathological shoulders	34/12	20 (10-46)	27 bilateral, 10 R, 9 L	Rehamate	Standing position with elbows at their sides	60°/s; conc.	IR, ER, and ER/IR ratio	Before and after rehabilitation program	ER/IR ratio decreased from 0.84 to 0.70, (0.70 is the normalized value according to literature)

Rupp et al.[7] (1995)	22 competitive healthy swimmers (11 with apprehension sign) and 22 subjects in control group	12/10 in healthy swimmer group and 12/10 in control group	17.7 (14-26)	All right-handed	KinCom H-2	Supine position at 90° of shoulder abduction	60°/s and 180°/s; conc.	IR, ER, and ER/IR ratio	Side-to-side and between-group differences	IR significantly higher than control group
Tsai et al.[13] (1991)	26 patients with nonoperatively treated anterior posttraumatic shoulder instability	3/23	23 (20-49)	11/13 and 2 bilateral	Cybex II	Standing position at 0° of shoulder abduction	30°/s; conc.	IR	Side-to-side differences	IR significantly lower on affected side
Warner et al.[6] (1990)	15 asymptomatic volunteers, 28 with macrotraumatic or microtraumatic glenohumeral instability, and 10 with impingement syndrome	7/9 in volunteer group, 8/20 in instability group, and 2/8 in group with impingement	27 (20-41) in volunteer group, 24 (16-43) in instability group, and 31 (17-47) in impingemen	11/20 in instability group and 8/2 in impingement group§	Biodex Multi-Joint Testing and Exercise	Standing position in a modified abducted position in scapular plane	90°/s and 180°/s; conc.	IR/ER ratio	Between-group differences	Significant differences between groups (decrease of ratio in instability shoulder)

			t group							

*Conc. = concentric, ecc. = eccentric, IR = internal rotator, and ER = external rotator. †KinCom (Kinetic Communicator) dynamometer was manufactured by Chattecx, Chattanooga, Tennessee; CybexNorm, Lumex, Ronkonkoma, New York; Rehamate, Kawasaki Juko, Kobe, Japan; KinCom H-2, Chatteccx; Cybex II, Cybex, Ronkonkoma, New York; and Biodex Multi-Joint, Biodex, Shirley, New York. ‡The value is given as the mean and the standard deviation. §Three patients had bilateral instability.

TABLE E-2 Characteristics of Recurrent Anterior Instability Group and Control Group Populations

	Recurrent Anterior Instability Group (N = 37)	Control Group* (N = 11)
Age† *(yr)*	24.5 ± 7.5	23.8 ± 1.4
Weight† *(kg)*	73.6 ± 9.1	69.5 ± 9.4
Height† *(cm)*	178.8 ± 6.4	178.4 ± 5.3
Elapsed time since first dislocation† *(yr)*	4.2 ± 4.9	NA
Circumstances of the first dislocation (sports/other)	26/11	NA
Shoulder side involved (dominant/nondominant)	20/17	NA
No. of dislocations*	3.1 ± 2.3	NA

*NA = not applicable. †The values are given as the mean and the standard deviation.