Arthroscopic Repair for Chronic Anterior Shoulder Instability

A Comparative Study Between Patients With Bankart Lesions and Patients With Combined Bankart and Superior Labral Anterior Posterior Lesions

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Background: Although labrum lesions in patients with chronic anterior shoulder instability may not only involve detachment of the anteroinferior labrum but a lesion of the superior glenoid labrum as well, no studies have compared the clinical outcome between patients with a lesion of the anteroinferior labrum and patients with a combined lesion of the anterior and superior labrum after arthroscopic shoulder stabilization.

Hypothesis: Arthroscopic repair of a combined lesion of the anterior and superior labrum may have inferior clinical outcome to repair of an anterior lesion only in patients with anterior shoulder instability.

Study Design: Cohort study; Level of evidence, 2.

Methods: Sixty-three patients operated on for anterior shoulder instability between April 2002 and June 2006 were included in this study. Patients with bone deficiency were excluded. Fixation of the detached labrum was performed using suture anchors. Thirty-eight patients had a lesion of the anterior labrum (group A), and 25 had a combined lesion of the anterior and superior labrum (group B). Patients were evaluated after a 2-year minimum follow-up with Constant and Rowe scores. Failure was defined as a redislocation or a subluxation episode.

Results: Patients in group B experienced a significantly higher number of dislocations preoperatively ($P < .05$). However, there was no difference between the 2 groups regarding the failure rate postoperatively. One patient from each group had a failed result. A mean loss of 5° and 8° of external rotation at 90° of abduction was noted in patients in groups A and B, respectively ($P = .113$). The Constant score was 94 in group A and 93 in group B ($P = .435$). The Rowe score was 91 in group A and 90 in group B ($P = .338$).

Conclusion: There are no differences in shoulder stability and function in patients with anterior shoulder instability and a lesion of the anteroinferior labrum and patients with an extended lesion of the anterior and superior labrum after arthroscopic shoulder stabilization.

Keywords: chronic anterior shoulder instability; Bankart lesion; SLAP lesion; combined labrum lesion

Although the Bankart lesion (detachment of the anteroinferior labrum with the attached inferior glenohumeral ligament from the glenoid rim) has been described many years ago[3] as the "essential lesion" in patients with anterior shoulder instability, biomechanical and clinical studies have demonstrated that a wide variety of pathological changes occurred in these patients.[26,27] In addition to the classic Bankart lesion, labrum injury may be present in these patients as an anterior labroligamentous periosteal sleeve avulsion (ALPSA) lesion,[20] a combined detachment of the anteroinferior and superior labrum,[9,30] or even as a triple labral (anterior, posterior, and superior) lesion.[14]

Injuries to the superior labrum have been described by Andrews et al[2] in 1985, and Snyder et al[25] classified these

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Figure 1. Schematic diagram of a type V superior labral anterior to posterior (SLAP) lesion. Labrum detachment (red line) extends from the 10-o'clock to 6-o'clock position including the anteroinferior and superior labrum.

lesions into 4 types and coined the term "SLAP" (superior labral anterior to posterior). Furthermore, Maffet et al[16] added 3 more types (V-VII) to the 4-part classification. According to their classification, a type V SLAP lesion (Figure 1) is a Bankart lesion that continues superiorly and includes a separation of the biceps complex (a combination of Bankart and type II SLAP lesions). Combined lesions of the glenoid labrum are not uncommon, especially in chronic cases because the severity of labrum lesions increases with time and the number of dislocations.[11] Most of the authors reported that a combination of a Bankart and type II SLAP lesion occurred in approximately 20% of cases with anterior instability.[9,24,30] In the series reported by Gartsman et al,[10] 57% of patients with chronic anterior instability had a type V SLAP lesion. Probably in these young patients, type II SLAP lesions are the result and not the cause of instability.

It is known that type II SLAP lesions result in increased glenohumeral translation and, when combined with a Bankart lesion, increase shoulder instability.[17,18,22] Therefore, surgical repair of both the Bankart and SLAP lesion (when they are present) in cases of anterior shoulder instability is required to stabilize the shoulder.[5,12,29] However, the effect of such an extensive surgical approach on clinical results (range of motion, complications, etc) compared with an isolated Bankart repair has not been clearly defined.

The purpose of this prospective study was to compare the clinical results of arthroscopic repair for chronic anterior shoulder instability between patients with a Bankart lesion and patients with a combination of Bankart and type II SLAP lesion (type V SLAP lesion). Because patients with a type V SLAP lesion required multiple points of fixation of the capsule and labrum to the glenoid, we believed that this would cause more excessive tension and, therefore, limitation of postoperative range of motion compared with patients with a Bankart lesion. Furthermore, we assumed that the healing rate of a type V SLAP lesion, because of its extensive nature, would be lower than for the classic Bankart lesion. Therefore, our hypothesis was that the deficit in range of motion and failure rate would be higher in patients with a combination of Bankart and type II SLAP lesion.

MATERIALS AND METHODS

Study Design

All patients seen in our department from April 2002 with chronic anterior shoulder instability were asked to enroll in the study if they met the following criteria: (1) posttraumatic chronic anterior shoulder instability (more than 1 episode of a true shoulder dislocation), (2) a normal contralateral shoulder, (3) a Bankart or an ALPSA lesion of the affected shoulder, (4) a combination of a Bankart/ALPSA lesion and a type II SLAP lesion, and (5) minimum follow-up of 2 years. A Bankart/ALPSA lesion was defined as a labral lesion from the 2-o'clock to 6-o'clock position (for a right shoulder), and a combined Bankart/ALPSA lesion and type II SLAP lesion was defined as a continuous labral lesion from the 10-o'clock to 6-o'clock position (for a right shoulder). Diagnosis of shoulder dislocation was made on the basis of a combination of history, radiographs with a dislocated shoulder, and the need for general anesthesia for shoulder reduction. Patients with lesions of the posterior glenoid labrum, a bony Bankart lesion or anterior glenoid defect more than 25%, generalized ligamentous laxity, and humeral avulsion of the glenohumeral ligament (HAGL) were excluded from the study.

Sixty-three consecutive shoulders in 63 patients who met the inclusion criteria were eligible for the study. From these patients, 2 groups of patients were formed. Group A consisted of 38 patients with a Bankart/ALPSA lesion, and group B consisted of 25 patients with a combined Bankart/ALPSA lesion and type II SLAP lesion. Comparison of the data showed that the 2 groups were well matched for age, sex, sports activity, and type of trauma for first dislocation (Table 1). Range of motion was normal, and apprehension test results were positive (in abduction and external rotation) in all patients preoperatively. All patients underwent preoperative radiographs including anteroposterior, axillary, and supraspinatus outlet views of the affected shoulder.

TABLE 1
Patient Data[a]

Variable	Group A (Bankart Lesion)	Group B (Bankart + SLAP Lesion)	*P* Value
No. of patients	38	25	
Mean age, y	26.2 (15-48)	29.8 (17-43)	.726
Sex			
Male	30	21	.367
Female	8	4	.212
Affected side			
Right	21	15	
Left	17	10	
Dominance			
Dominant arm	22	16	
Nondominant arm	16	9	
Mean no. of dislocations	8.1 (3-20)	18.6 (6-50)	.040
Mean age of first dislocation, y	21.9 (13-37)	24.6 (12-35)	.345
Time between surgery/injury, y	2.7 (0.3-11)	5.3 (0.8-20)	.027
Sport activity			
Recreational (contact sport)	13 (11)	9 (7)	.834
Competitive (contact sport)	6 (5)	4 (4)	.736
None	19	12	.338
Cause of first dislocation			
Sports	25	18	.245
Falls	8	4	.312
MVA	5	3	.223
Preoperative score (points)			
Constant	44 .5 (30-55)	42.3 (34-53)	.811
Rowe	29.8 (18-47)	26.5 (15-42)	.754

[a]SLAP, superior labral anterior to posterior; MVA, motor vehicle accident. Ranges in parentheses.

Operative Technique

All patients were treated between April 2002 and June 2006 by the senior author (M. E. H.). The patient was positioned in the lateral decubitus position, and before surgery, an examination under anesthesia (EUA) for anterior translation with the arm in abduction was performed and instability classified according to Altchek and Dines.[1] Standard arthroscopic portals, including posterior, anterosuperior, and anteroinferior, were used in all cases. Examination of the joint and labrum condition was performed using the posterior and anterosuperior portals as viewing portals. Other abnormalities like Hill-Sachs lesions, loose bodies, and capsular redundancy were recorded. Inferior glenoid measurement was performed using a probe with the arthroscope in the anterosuperior portal according to Lo et al.[15] In all cases, mobilization of the capsulolabral tissue and slight decortication of the bone bed of the anterior (and superior, when necessary) glenoid was performed. Absorbable suture anchors (Bio Anchor, Linvatec, Largo, Florida) with No. 2 nonabsorbable sutures were used with the first anchor placed at the 5-o'clock position. All anchors were placed on the face of the glenoid. A curved suture hook (Linvatec) loaded with a No. 0 PDS suture was used to pass the anchor sutures through the capsule and labrum. To achieve a south to north capsular translation and eliminate a redundant pouch, the capsular tissue was pierced at least 1 cm inferior to the anchor. A Nicky's arthroscopic sliding knot was used to secure anchor sutures.[7] Usually 3 to 4 anchors for repair of a Bankart/ALPSA were used. If a combined Bankart/ALPSA lesion and type II SLAP lesion was diagnosed, an additional portal 1 cm posterior and lateral to the lateral edge of the acromion (port of Wilmington) was created (after completion of Bankart/ALPSA repair) to facilitate SLAP repair.[19] The superior labrum repair was performed in a similar fashion using the posterior portal as the viewing portal and the anterosuperior and port of Wilmington as working portals. Usually 2 anchors for repair of a superior labrum lesion were used.

Rehabilitation Protocol

The rehabilitation protocol was the same for both groups of patients, and all patients participated in physical therapy. A sling was used to immobilize the shoulder in internal rotation and 20° of abduction for 3 weeks. During this period, patients were allowed to flex and extend their elbows and wrists and perform axilla hygiene. After this period, the sling was discontinued, and active-assisted shoulder elevation was initiated. External rotation stretching was progressively increased to achieve 60° by 12 weeks. Rotator cuff–strengthening exercises were allowed after 6 weeks and full participation in sports after 6 months.

Evaluation Protocol

Preoperative as well as postoperative evaluations of patients were performed using the Constant[6] and Rowe[23] scores. A visual analog scale (VAS) was used to assess pain. Recurrence or failure was defined as a redislocation or subluxation episode. A detailed physical examination regarding shoulder motion was performed including forward elevation and external rotation with the arm at 90° of abduction. At the latest follow-up, patients were asked about their activity level after surgery. All patients were evaluated at the same time by 2 authors who were not aware of the type of procedure (isolated Bankart/ALPSA or a combined Bankart/ALPSA and type II SLAP lesion repair). A nonpaired *t* test was used for comparison between the 2 groups. Significance was set at $P < .05$.

RESULTS

Patients in group B experienced a significantly higher number of dislocations preoperatively compared with group A (18 vs 8). Similarly, the interval time between injury (time of first dislocation) and surgery was significantly longer for patients in group B than in group A (5.3 vs 2.7 years; $P = .027$) (Table 1).

Table 2 summarizes the results of EUA, arthroscopic findings, and anchor number placed in each group. There

TABLE 2
Intraoperative Findings[a]

Variable	Group A (Bankart Lesion)	Group B (Bankart + SLAP Lesion)	*P* Value
No. of patients	38	25	
Anterior translation			
Grade 2	9	8	.435
Grade 3	29	17	.338
Bankart	24 (63%)	18 (72%)	.295
ALPSA	14 (37%)	7 (28%)	.640
Hill-Sachs lesion	36 (95%)	25 (100%)	.874
Loose bodies	7	6	.731
Partial rotator cuff tears	1	2	.456
Mean no. of anchors	3.2 (2-4)	5.5 (4-8)	.031
Procedure time, min	67 (50-75)	104 (78-132)	.015

[a]SLAP, superior labral anterior to posterior; ALPSA, anterior labroligamentous periosteal sleeve avulsion. Ranges in parentheses, unless otherwise specified.

TABLE 3
Clinical Results at the Last Follow-up[a]

Variable	Group A (Bankart Lesion)	Group B (Bankart + SLAP Lesion)	*P* Value
Follow-up time, mo	38.4 (25-66)	40.6 (27-60)	.454
Postoperative score (points)			
Constant	94.2 (52-100)	93 (54-100)	.435
Rowe	91.8 (54-97)	90.2 (60-98)	.338
Recurrences	1	1	.411
Positive apprehension test result	3	2	.228
VAS score (points)	0.5 (0-4)	0.7 (0-4)	.512
External rotation deficit in 90° of abduction	5.2° (2°-9°)	8.3° (4°-12°)	.113
Forward elevation	175° (168°-177°)	172° (169°-178°)	.557
Return to work	38/38	25/25	
Return to sports	17/19	10/13	.743

[a]SLAP, superior labral anterior to posterior; VAS, visual analog scale. Ranges in parentheses.

were no significant differences between the 2 groups regarding anterior translation. The majority of the patients in both groups had a grade 3+ anterior translation. The distribution of Hill-Sachs lesions, partial tears of the rotator cuff, and presence of loose bodies was equal between the 2 groups. A slight debridement was performed when a partial rotator cuff tear was present. A Hill-Sachs lesion was identified on standard radiographs in 8 patients from group A and 5 patients from group B. However, no patient had a bony Bankart lesion. The number of suture anchors used was significantly higher in group B than in group A (5.5 vs 3.2; $P = .031$) secondary to extra suture anchor placement for the SLAP repair. Time required for completion of the procedure was significantly longer for patients with combined Bankart/ALPSA and type II SLAP lesions.

There was no difference between the 2 groups regarding failure rate. Two patients had failed results. One patient from group A redislocated his shoulder while playing basketball, and 1 patient from group B reported an episode of subluxation when his shoulder was placed by force in abduction and external rotation. Three patients from group A and 2 patients from group B had a positive apprehension test result at the last follow-up evaluation. The postoperative Constant and Rowe scores as well as VAS scores are presented in Table 3. All shoulder scores improved postoperatively in both groups. There was no significant difference between the 2 groups in terms of shoulder motion. Only 1 patient from group B had an external rotation deficit more than 10°. Finally, all patients in both groups returned to their work, while 89% (17 of 19) of the patients from group A and 76% of the patients from group B (10 of 13) returned to their preinjury sport activity after surgery.

DISCUSSION

The severity and extension of labrum lesions in patients with chronic instability are significantly increased compared with patients with acute instability.[11,30] In our series, 40% of our patients had a combined Bankart/ALPSA and type II SLAP lesion, which is higher than reported in other studies.[9,24,30] These findings can be explained by the fact that, in our series, there was a longer interval between injury and surgery than in previous studies.[9,24,30] We assume that the longer interval between injury and surgery and number of dislocations played a significant role for the development of extension of the labrum lesion and the high number of patients with type V SLAP lesions in our study. However, our findings are in accordance with those of Gartsman et al,[10] who reported a high incidence (57%) of type II SLAP lesions in patients with chronic anterior instability. According to our results, this group of patients with a combined labrum lesion suffered a significantly higher number of shoulder dislocations preoperatively compared with patients with an "isolated" Bankart/ALPSA lesion. An explanation of these findings, according to biomechanical studies, could be the increased anterior and inferior translation after detachment of the superior labrum and therefore increased shoulder instability (when it is combined with a Bankart lesion).[17,21,22]

According to our results, no significant differences in terms of failure rate and range of motion were noted between the 2 groups. Therefore, our hypothesis that range of motion deficit and failure rate would be higher in patients with a combined Bankart and type II SLAP lesion than in patients with an "isolated" Bankart/ALPSA lesion was not confirmed. Similar to our study, te Slaa et al[28] found no correlation between recurrence rate and intra-articular injury in patients with acute instability. Gartsman et al[10] also reported no association between recurrence rate and number of preoperative dislocations. These authors suggested that correction of any soft tissue injury is the critical factor to achieve a good result after arthroscopic

management of anterior shoulder instability, at least when significant bone deficiencies do not exist, as in our study. Reattachment of the anterior labrum to the glenoid to create a "bumper" effect, repair of the superior labrum, and reduction of capsular volume are critical parameters for a successful result. The techniques used today permit an anatomical "Bankart" reconstruction and give the surgeon the ability to address any associated pathological changes. Using these newer techniques, the results of arthroscopic repair of anterior shoulder instability are almost equivalent to those of open techniques.[10]

The overall failure rate was 3% in our series. In addition, 5 more patients (3 from group A and 2 from group B) had a positive apprehension test finding. These results are in accordance with recent studies that reported low recurrence rates after arthroscopic repair for anterior shoulder instability.[9,10] However, our follow-up time (although more than 2 years) is short, and it is known that a period of at least 4 to 5 years is required to assess the final results; this is a limitation of our study.[8,13] Furthermore, only 50% of our study population participated in sports activities (35% in recreational and 15% in competitive sports). Therefore, our sample was not a high-demand patient population, and the results could be different in a different group (high demand) of patients. Nevertheless, 85% of our patients returned to their preinjury sports activities, and there were no differences between groups A and B.

We found that the time required for labrum repair was significantly longer for group B than group A. Thus, the surgeon must be prepared for the possibility to spend additional time and effort in cases of chronic anterior shoulder instability if a type V SLAP lesion is present. We prefer to repair the anterior labrum lesion first and then the SLAP lesion. If one begins with the SLAP repair first, then visualization will be limited, making anterior labrum repair more difficult, as has been pointed out by other authors.[14] We used a significantly higher number of suture anchors in patients with a combined Bankart/ALPSA and type II SLAP lesion than in patients with a Bankart/ALPSA lesion. One can assume that multiple points of fixation of the capsule and labrum to the glenoid would cause excessive tension, and therefore, limitation of postoperative range of motion is expected. However, according to our results, the deficit in range of motion, and especially external rotation, was not different between the 2 groups. Our results are similar to those of other reports, although direct comparison cannot be made because there is no separation between patients with limited and extended labrum lesions in any of these studies.[9,10,14,29]

In addition to short follow-up time, this study has some other limitations. Patients included in this study had no or small bone defects, which is a risk factor for recurrence after arthroscopic repair for anterior shoulder instability.[4] Therefore, the results of our study should be viewed with caution because they cannot be applied to all instability patients. However, our study is a prospective study and has the advantages of a consecutive series of patients, operated by the same surgeon. Finally, patients were evaluated by 2 independent reviewers.

CONCLUSION

Combined lesions of the anterior and superior labrum are common in patients with chronic anterior instability. Arthroscopic repair of these lesions using suture anchors is challenging and time consuming. However, after repair of a combined Bankart and type II SLAP lesion, similar results can be expected to those in patients with an "isolated" Bankart lesion in terms of shoulder function and stability.

REFERENCES

1. Altchek DW, Dines DM. Shoulder injuries in the throwing athlete. *J Am Acad Orthop Surg*. 1995;33:159-165.
2. Andrews JR, Carson W Jr, McLeod W. Glenoid labrum tears related to the long head of the biceps. *Am J Sports Med*. 1985;13:337-341.
3. Bankart ASB. The pathology and treatment of recurrent dislocation of the shoulder joint. *Br J Surg*. 1938;26:23-28.
4. Burkhart SS, De Beer JF. Traumatic glenohumeral bone defects and their relationship to failure of arthroscopic Bankart repairs: significance of the inverted-pear glenoid and the humeral engaging Hill-Sachs lesion. *Arthroscopy*. 2000;16:677-694.
5. Burkhart SS, Morgan C. SLAP lesions in the overhead athlete. *Orthop Clin North Am*. 2001;32:431-441.
6. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. *Clin Orthop*. 1987;214:160-164.
7. De Beer JF, van Rooyen K, Boezaart AP. Nicky's knot: a new slip knot for arthroscopic surgery. *Arthroscopy*. 1998;14:109-110.
8. Elmund A, Kartus K, Sernert N, Hultenheim I, Ejerhed L. A long-term clinical follow-up study after arthroscopic intra-articular Bankart repair using absorbable tacks. *Knee Surg Sports Traumatol Arthrosc*. 2008;16:707-712.
9. Garofalo R, Mocci A, Moretti B, et al. Arthroscopic treatment of anterior shoulder instability using knotless suture anchors. *Arthroscopy*. 2005;21:1283-1289.
10. Gartsman GM, Roddey TS, Hammerman SM. Arthroscopic treatment of anterior-inferior glenohumeral instability. *J Bone Joint Surg Am*. 2000;82:991-1003.
11. Habermeyer P, Gleyze P, Ricket M. Evolution of lesions of the labrum-ligament complex in posttraumatic anterior shoulder instability: a prospective study. *J Shoulder Elbow Surg*. 1999;8:66-74.
12. Kim TK, Queale WS, Cosgarea AJ, McFarland EG. Clinical features of the different types of SLAP lesions: an analysis of one hundred and thirty-nine cases. *J Bone Joint Surg Am*. 2003;85:66-71.
13. Koss S, Richmond JC, Woodward JS Jr. Two- to five-year follow-up of arthroscopic Bankart reconstruction using a suture anchor technique. *Am J Sports Med*. 1997;25:809-812.
14. Lo IK, Burkhart SS. Triple labral lesions: pathology and surgical repair technique. Report of seven cases. *Arthroscopy*. 2005;21:186-193.
15. Lo IK, Parten PM, Burkhart SS. The inverted pear glenoid: an indicator of significant bone loss. *Arthroscopy*. 2004;20:169-174.
16. Maffet MW, Gartsman GM, Moseley B. Superior labrum-biceps tendon complex lesions of the shoulder. *Am J Sports Med*. 1995;23:93-98.
17. McMahon PJ, Burkart A, Musahl V, Debski RE. Glenohumeral translations are increased after a type II superior labrum anterior-posterior lesion: a cadaveric study of severity of passive stabilizer injury. *J Shoulder Elbow Surg*. 2004;13:39-44.
18. Mihata T, McGarry MH, Tibone JE, Fitzpatrick MJ, Kinoshita M, Lee TQ. Biomechanical assessment of type II superior labral anterior-posterior (SLAP) lesions associated with anterior shoulder capsular laxity as seen in throwers: a cadaveric study. *Am J Sports Med*. 2008;36:1604-1610.
19. Morgan CD, Burkhart SS, Palmeri M, Gillespie M. Type II SLAP lesions: three subtypes and their relationship to superior instability and rotator cuff tears. *Arthroscopy*. 1998;14:553-565.

20. Neviaser TJ. The anterior labroligamentous periosteal sleeve avulsion lesion: a cause of anterior instability of the shoulder. *Arthroscopy*. 1993;9:17-21.
21. Pagnani MJ, Deng XH, Warren RF, Torzilli PA, Altchek DA. Effect of lesions of the superior portion of the glenoid labrum on glenohumeral translation. *J Bone Joint Surg Am*. 1995;77:1003-1010.
22. Pappas AM, Goss TP, Kleinman PK. Symptomatic shoulder instability due to lesions of the glenoid labrum. *Am J Sports Med*. 1983;11: 279-288.
23. Rowe CR, Patel D, Southmayd WW. The Bankart procedure: a long-term end-results study. *J Bone Joint Surg Am*. 1978;60:1-16.
24. Snyder SJ, Banas MP, Karzel RP. An analysis of 140 injuries to the superior glenoid labrum. *J Shoulder Elbow Surg*. 1995;4:243-248.
25. Snyder SJ, Karzel RP, Del Pizzo W, Ferkel RD, Friedman MJ. SLAP lesions of the shoulder. *Arthroscopy*. 1990;6:274-279.
26. Speer KP, Deng X, Borrero S, Torzilli PA, Altcheck DA, Warren RF. Biomechanical evaluation of a simulated Bankart lesion. *J Bone Joint Surg Am*. 1994;76:1819-1825.
27. Taylor DC, Arciero RA. Pathologic changes associated with shoulder dislocations: arthroscopic and physical examination findings in first-time traumatic anterior dislocations. *Am J Sports Med*. 1997;25:306-311.
28. te Slaa RL, Brand R, Marti RK. A prospective arthroscopic study of acute first-time anterior shoulder dislocation in the young: a five-year follow-up study. *J Shoulder Elbow Surg*. 2003;12:529-534.
29. Warner JJ, Kann S, Marks P. Arthroscopic repair of combined Bankart and superior labral detachment anterior and posterior lesions: technique and preliminary results. *Arthroscopy*. 1994;10:383-391.
30. Yiannakopoulos CK, Mataragas E, Antonogiannakis E. A comparison of the spectrum of intra-articular lesions in acute and chronic anterior shoulder instability. *Arthroscopy*. 2007;23:985-990.