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Anterior Knee Pain and Bone Defects in ACL Reconstruction

ABSTRACT & COMMENTARY

Synopsis: Bone grafting to refill patellar and tibial defects from graft harvest did not affect the incidence of anterior knee pain following ACL reconstruction.

Source: Boszotta H, Prunner K. Refilling of removal defects: Impact on extensor mechanism complaints after use of a bone-tendon-bone graft for anterior cruciate ligament reconstruction. *Arthroscopy* 2000;16:160-164.

Although patella tendon autografts are commonly used for anterior cruciate ligament (ACL) reconstructions, patients not infrequently experience donor site morbidity. While bone grafting the patella defect has been shown to reduce fracture risk, it is not known whether bone grafting can reduce extensor mechanism complaints after reconstruction. Boszotta and Prunner addressed this with a prospective study involving 132 patients. From 1992 to 1995, patients underwent ACL reconstruction by one of two surgeons using similar techniques, except one surgeon used coring reamers for the tunnels and placed the bone in the tibial and patellar defects, while the other surgeon left the defects empty. The tendon defect was closed in both groups. There were 70 patients in the grafted group and 62 patients in the empty defect group.

At an average of 31 months for the grafted group and 37 months for the nongrafted group, all patients were evaluated radiographically and clinically. There were no major differences in complications between the two groups, and no patella fractures or patella tendon ruptures were seen. There were no significant differences between the two groups for stability as measured by physical examination or KT-1000 arthrometry, or for clinical outcome as measured by IKDC scores.

Roughly half of all patients complained of mild or moderate symptoms involving the extensor mechanism. In fact, the mean visual analog scale (VAS) scores for all patients (0 = no pain, 10 = severe pain) were nearly 6 for kneeling and 4 for squatting. There were no signifi-

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cant differences between the two groups by VAS for kneeling, squatting, stair climbing, crepitation, or anterior knee pain. Pain complaints correlated most closely with time since surgery, with few problems noted after two years. Also, pain related to the extensor mechanism showed a statistically significant correlation with loss of motion, including both flexion and extension deficits.

■ **COMMENT BY DAVID R. DIDUCH, MS, MD**

Extensor mechanism and anterior knee pain complaints can be seen with any graft choice for ACL reconstruction, but have been most commonly associated with patella tendon bone-tendon-bone autografts. In some instances, these complaints can drive graft selection, especially when patients are known to have pre-existing patellofemoral chondromalacia changes and pain. Although the ideal graft choice for ACL reconstruction is controversial and surgeon- and patient-dependent, patellar tendon removal does not appear to be the exclusive reason for patellofemoral complaints.

Boszotta and Prunner have effectively demonstrated that filling the defects with bone graft does not appear to affect extensor mechanism pain or complaints. No significant differences were seen between the two groups. They did this with a thorough, prospective study with

adequate follow-up. Ideally, a single surgeon would have done both types of procedures to avoid influencing the results by subtle differences in technique. However, the fact that no differences were seen between the groups suggests that a step as small as grafting the defects during the procedure does not matter.

It probably does matter, however, to help reduce the risk of patella fracture. Because the risk of fracture following graft harvest has been shown to be approximately 1%, the sample size in this study was too small to determine any benefit in this regard. Boszotta and Prunner conclude that they now routinely fill the defects, but their results could just as easily have been interpreted the opposite way since no differences were noted. Given that fracture risk is diminished and cosmesis improved, filling the patella defect with bone graft remains a reasonable option.

With regards to anterior knee pain, this study confirms others in the literature that time since surgery and range of motion, especially extension, are most important. Loss of motion is not unique to patella tendon autografts. Good tunnel placement that avoids notch impingement, followed by appropriate rehabilitation to achieve full motion, would appear more important than the question of refilling bone defects to help avoid extensor mechanism pain. ❖

Sports Medicine Reports, ISSN 1524-0991, is published monthly by American Health Consultants, 3525 Piedmont Rd., NE, Bldg. 6, Suite 400, Atlanta, GA 30305.
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GST Registration Number: R128870672.
 Periodical postage pending at Atlanta, GA.
POSTMASTER: Send address changes to **Sports Medicine Reports**, P.O. Box 740059, Atlanta, GA 30374.

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Subscription Prices

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 \$199 per year (Student/Resident rate: \$100).
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 1-9 additional copies: \$179 each. 10-20 copies: \$159 each.
Canada
 Add GST and \$30 shipping.
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Measuring the Effects of Mild Head Injury

ABSTRACT & COMMENTARY

Synopsis: *Clinical assessments of balance parallel laboratory measures of postural stability in documenting post-injury postural control deficits in mild head-injured subjects.*

Source: Riemann BL, Guskiewicz KM. Effects of mild head injury on postural stability as measured through clinical balance testing. *Journal of Athletic Training* 2000;35:19-25.

Mild head injury (mhi) in athletes continues to present a special challenge to physicians responsible for making decisions about when safe return to competition following injury can be permitted. Criteria for return have traditionally included neuropsychological assessment and, more recently, measures of postural control. Riemann and Guskiewicz used a clinical balance testing procedure to assess the effects of mild head injury on postural stability in 16 mild head-injured athletes and 16 matched controls.

Statement of Financial Disclosure

American Health Consultants does not receive material commercial support for any of its continuing medical education publications. In order to reveal any potential bias in this publication, and in accordance with Accreditation Council for Continuing Medical Education guidelines, we disclose that Dr. Diduch serves as a consultant to DePuy Orthotech, Dr. Gunther, Dr. Holmes, Dr. Perrin, Dr. Schenck, and Dr. Slauterbeck report no consultant, stockholder, speaker's bureau, research, or other financial relationships with companies having ties to this field of study.

The subjects were assessed for postural stability on days 1, 3, and 5 post-injury using a clinical balance battery consisting of three stances (double leg, single leg, and tandem) on two surfaces (firm and foam). A Balance Error Scoring System (BESS) was devised, which was calculated by adding one error point for each error. The errors included 1) lifting hands off the iliac crests; 2) opening the eyes; 3) stepping, stumbling, or falling; 4) moving the hip into more than 30° of flexion or abduction; 5) lifting the forefoot or heel; and 6) remaining out of the testing position for more than 5 seconds. The BESS had been previously described, and its reliability established.¹

To ascertain if the clinical balance measures would parallel laboratory measures of balance, the subjects were also assessed using the Sensory Organization Test (SOT) on a NeuroCom Smart Balance Master. The SOT test protocol consisted of three 20-second trials under three visual conditions (eyes open, eyes closed, sway referenced) and two support surfaces (stable, sway referenced). Mild head injury was defined as a Glasgow coma score greater than 12, less than 20 minutes of unconsciousness, hospitalization for less than 48 hours, and negative findings on neuroimaging.

Riemann and Guskiewicz found nine of the 16 mild head-injured subjects had post-concussion symptoms up to three days post-injury, and two complained of symptoms up to five days post-injury. The MHI subjects had higher error scores on the BESS than the control subjects on day one post-injury on the firm surface and on days 1 and 3 post-injury on the foam surface. For the SOT scores, the MHI subjects had increased postural instability on day 1 post-injury in comparison to the control subjects, and in comparison to their own day 3 post-injury scores.

■ COMMENT BY DAVID H. PERRIN, PhD, ATC

Riemann et al have previously demonstrated that athletes experiencing mild head injury have balance deficits up to three days post-injury, sometimes in the absence of deficits in neurocognition.¹ The primary limitation of these studies has been the need to use sophisticated and expensive laboratory equipment to measure postural stability. In this study, Riemann and Guskiewicz found balance deficits up to three days post-injury on a foam surface with the clinical balance measures. Interestingly, the testing on the laboratory balance device found deficits only to day 1 post-injury. Riemann and Guskiewicz attributed the differences in findings with the two methods of testing to the potential of having assessed different aspects of postural control. They also postulated that differences in the

scale of the measurements might have contributed to the disparate findings.

The process of deciding when a head-injured athlete can safely return to competition is a complex one. Physicians are too often faced with this dilemma in the absence of objective criteria upon which to base the decision. The findings of this paper are encouraging, in that they offer a clinically useful and readily available method by which to evaluate postural control in head-injured subjects. In all probability, a combination of cognitive testing and objective assessment of postural stability offers the best battery of information upon which to decide if a head-injured athlete is ready for return to competition. Further study on the validity of this system of clinical evaluation of postural control in head-injured subjects is indicated. This model has the potential of adding an important component to the evaluation tools readily accessible to the attending team physician. ❖

Reference

1. Riemann BL, et al. Relationship between clinical and forceplate measures of postural stability. *J Sport Rehabil* 1999;8:71-82.

The Effects of McConnell Taping on Knee Kinetics

ABSTRACT & COMMENTARY

Synopsis: *Patellar taping improved knee extensor moments and knee power in patients with patellofemoral pain syndrome.*

Source: Ernst GP, et al. Effect of patellar taping on knee kinetics of patients with patellofemoral pain syndrome. *J Orthop Sports Phys Ther* 1999;29(11):661-667.

Patellofemoral pain syndrome has long been a challenge for all involved in knee rehabilitation. It is a condition that is relatively common in an active population. Malalignment of the patellofemoral joint is often considered a contributing factor if not a primary cause. To that end, rehabilitation has often included some type of quadriceps strengthening exercises. Theoretically, these exercises have emphasized strengthening of the vastus medialis obliquus (VMO) in an effort to affect patella tracking. McConnell devised a taping technique that can be used during such exercise (as well as during daily activities) that supposedly realigns the patella. The

purpose of this study was to compare maximal knee extensor moment, knee power, and vertical jump height with and without the McConnell taping.

Fourteen females with a mean age of 24 and with a history of patellofemoral pain were recruited for the study. Duration of the pain was from six weeks to 10 years, and all patients had pain that worsened with stairs, squatting, kneeling, or running. All of the subjects were asked to perform a single-leg vertical jump and a lateral step up under four randomized conditions: McConnell tape, placebo tape, no tape, and uninvolved extremity. Data were collected in a motion analysis laboratory using the Vicon Motion Analysis System that included six cameras, a force plate, and computer plus software. All taping was done by the same experienced physical therapist.

Subjects were given warm-up trials and then measurements were taken on three successive trials. A two-way repeated measures analysis of variance (ANOVA) was used to analyze the data. In addition to the ANOVA, Intraclass Correlation Coefficients were also performed on the measures in order to determine reliability of the measurements. The McConnell taping condition had a significantly greater knee extensor moment and knee power than the other three conditions, including the uninvolved extremity. However, the uninvolved extremity performed a significantly higher vertical jump than the other three conditions.

■ **COMMENT BY CLAYTON F. HOLMES, EdD, PT, ATC**

McConnell taping is based on the premise that the tape changes the biomechanics of the patellofemoral joint. However, few imaging studies are available that demonstrate an actual change in biomechanics. This study is an attempt to look at patient performance instead of evaluating the theoretical reason for a change in performance. Indeed, this study does demonstrate improved performance with McConnell taping. In addition, the design includes “placebo taping” so variables such as proprioception can supposedly be ruled out as the reason behind increased performance. This study used motion analysis to measure performance. This is a significant step in the right direction for this type of research. Finally, it should be noted that, while this study may be a valiant attempt to rule out some variables, one cannot assume that the reason for the improved performance is a biomechanical change in the patellofemoral joint. In addition, one cannot assume that a change in VMO activity has occurred with the taping, also an assumption that has been difficult to demonstrate. Instead, one can simply say that the performance of the patient changed with the taping. ❖

Reconstruction of the AC Joint

ABSTRACT & COMMENTARY

Synopsis: *Reconstruction of the acromioclavicular (AC) joint for acromioclavicular joint separations can reproduce strength and stiffness similar to the intact coracoclavicular ligaments, but only some repairs do so.*

Source: Harris RI, et al. Structural properties of the intact and the reconstructed coracoclavicular ligament complex. *Am J Sports Med* 2000;28:103-108.

Shoulder separations commonly occur during athletics and frequently can be treated without surgery. When surgery is necessary, several techniques exist to reconstruct the acromioclavicular (AC) joint.¹ The method that is biomechanically strongest is unclear. Harris and colleagues in a cadaver model performed a biomechanical experiment to test the strength and stiffness of an intact coracoclavicular ligament complex (conoid, trapezoid ligaments). They measured average ligamentous stiffness (103 N/m) and elongation to failure (7.7 mm) in 19 cadaver specimens. They then tested several reconstruction methods with the same testing conditions for load to failure. The coracoclavicular slings (polyester tape) and suture anchors provided similar strength but significantly greater deformation than intact ligaments.² The Bosworth screw provided similar strength and stiffness to the intact ligaments, but only if inserted with bicortical fixation.³ The coracoacromial ligament transfers (Weaver-Dunn procedure) were the weakest and least stiff.⁴ Harris et al suggest supplementation of the Weaver-Dunn procedure with another technique. They also state that coracoclavicular slings are strong but elastic. Coracoid screw placement strength depends upon accurate placement. Harris et al conclude that these biomechanical factors should guide the surgeon both in choice of fixation and in progression of rehabilitation.

■ **COMMENT BY STEPHEN B. GUNTHER, MD**

Most AC separations do not require surgical reconstruction. However, the ideal fixation for the few cases that do require surgery has been controversial, and most of these surgical procedures have a significant failure rate. This laboratory experiment answers important questions about both the intact and the reconstructed coracoclavicular ligament complex. The intact coracoclavicular ligament failed at midsubstance or by avulsion

at approximately 500N. The conoid ligament appears to be the primary restraint to superior translation, with the trapezoid playing a relatively secondary role. This is the first study to describe the ultimate structural properties of the intact coracoclavicular ligament complex.

None of the reconstructions reproduced the native biomechanical characteristics of the intact coracoclavicular ligament complex, but some were relatively comparable. These results provide important quantitative data about the immediate mechanical behavior of a few types of reconstruction for AC joint separations. This information is important because the reconstructive procedures have a significant complication rate, which includes screw loosening, pin migration, recurrent deformity, clavicle fracture, and others. The surgeon must carefully screen patients to avoid unnecessary surgery, and must also attend to detail in order to reproduce biomechanical strength and stiffness for surgical repairs. ❖

References

1. Rockwood CA, et al. Injuries to the acromioclavicular joint. In: Rockwood CA, et al, eds. *Fractures in Adults*. vol. 2, 4th ed. Philadelphia, Pa: Lippincott-Raven; 1996: 1341-1413.
2. Neviasser RJ. Injuries to the clavicle and acromioclavicular joint. *Ortho Clin N Am* 1987;18:433-438.
3. Bosworth BM. Acromioclavicular separation: New method of repair. *S Gynecol Obstet* 1941;73:866-871.
4. Weaver JK, Dunn HK. Treatment of acromioclavicular joint injuries, especially complete acromioclavicular separation. *J Bone Joint Surg Am* 1972;54:1187-1194.

Posterior Internal Impingement of the Rotator Cuff in Throwers

ABSTRACT & COMMENTARY

Synopsis: One hundred percent of symptomatic throwers demonstrated internal impingement of the undersurface of the rotator cuff against the glenoid rim on arthroscopic examination.

Source: Paley KJ, et al. Arthroscopic findings in the overhand throwing athlete: Evidence for posterior internal impingement of the rotator cuff. *Arthroscopy* 2000;16:35-40.

Classic impingement syndrome of the rotator cuff involves outlet impingement beneath the coracacromial arch, and responds well to surgical decompression

of the subacromial space. Young, throwing athletes often are the exception, with difficulty demonstrated on attempts to return to throwing activities. The concept of internal impingement secondary to instability has been proposed as an etiology of nonoutlet impingement that would not respond to subacromial decompression.

Paley and colleagues present their arthroscopic findings in 41 consecutive, male professional throwing athletes to help us understand these complex shoulder relationships. All patients complained of pain during the late cocking or acceleration phase that limited their throwing ability. The dominant arm was involved in all subjects, and none described a single traumatic episode. On exam, 26% demonstrated classic impingement (Neer or Hawkins signs). Subtle instability, as demonstrated by the relocation test or pain on the apprehension test, was evident in about 63%. However, none of the patients had true apprehension or gross instability. These patients were examined arthroscopically prior to being treated with anterior capsular labral reconstruction.

Paley et al found that 100% of patients had internal impingement with the arm in 90° of abduction and maximal external rotation (the cocking phase of throwing). They defined internal impingement as contact between the undersurface of the rotator cuff and the posterior superior glenoid rim, or osteochondral lesions on the humeral head (17%). Partial thickness tears (fraying) of the rotator cuff were present in 93%, and posterosuperior labral fraying was present in 88%. Anterior pathology included anterior labral fraying (36%), Bankart lesions (10%), and SLAP lesions (10%). A positive relocation test was associated with posterior pathology in all cases, while a negative relocation test was associated with combined anterior and posterior pathology in 44% of cases.

■ COMMENT BY DAVID R. DIDUCH, MS, MD

This paper by Paley et al helps us better understand the etiology of nonoutlet impingement by providing arthroscopic, physical examination, and patient history correlations. While Paley et al do not attempt to evaluate treatment outcomes, they effectively demonstrate internal impingement findings at arthroscopy. These undersurface rotator cuff tears and osteochondral injuries would not likely be improved by subacromial decompression.

I believe that this is the important thing to be learned from their observations. When a young patient, especially a throwing athlete, presents with impingement findings, we should consider internal impingement due to microinstability as an etiology as opposed to classic, outlet impingement. The treatment will likely be quite different. Throwing athletes develop excessive external rotation to help achieve velocity. This comes at the expense of anterior

capsular stretch from repetitive microtrauma, or possibly due to traumatic avulsion (Bankart lesion). When the shoulder is in the cocking phase of throwing, the anterior capsular laxity allows forward translation and secondary posterior pinching or impingement of the rotator cuff. Paley et al also found the Jobe relocation test (posterior pain on abduction, external rotation that is relieved by a posteriorly directed force) to be helpful diagnostically.

This well-focused study effectively demonstrates internal impingement of the rotator cuff between the posterosuperior glenoid rim and the humeral head in the throwing athlete. The paper also outlines elements of the history, examination, and arthroscopic findings that will help in making the proper diagnosis so that patients can receive the proper treatment. ❖

Surgeon Supply and Demand: The Future of Orthopaedics

ABSTRACT & COMMENTARY

Synopsis: *Managed care pressures will create orthopaedic physician shortages despite increasing demands for care as baby boomers reach retirement.*

Source: Clark R, Thurston NK. The future of orthopaedics in the United States: An analysis of the effects of managed care in the face of an excess supply of orthopaedic surgeons. *Arthroscopy* 2000;16:116-120.

This special report is a useful historical review of the financial changes occurring in orthopaedics and medicine over the past two decades. Beginning with the standard concept of fee for service, physicians routinely charged a customary prevailing rate (CPR) with an initial Medicare discount of 10% in 1965 that has grown to 50% and greater currently. With such financial pressures, cost shifting to the private sector occurred, creating an increase in health care costs twice the overall rate of inflation such that the cost of medical care rose to 14% of the gross national product in 1994. The insurance industry responded with the introduction of preferred provider organizations (PPO), followed by the introduction of the health maintenance organization (HMO), with cost and risk shifting to the clinician with capitated budgets. Results of such limitations created some contracts that did not even cover out-of-pocket expenses.

Clark and Thurston describe these new medical care organizations (MCO) as imperfect competition. In con-

trast to the normal supply and demand scenario, imperfect competition with MCOs creates two changes: 1) the consumer does not have full information regarding the nature of the product, including its quality and marginal value; and 2) the consumer does not face the full marginal cost of purchasing the goods being consumed. From the patient's perspective, there is much uncertainty about the value or quality of care. With the control of price from the insurance industry, there is little sensitivity to price in relation to the type of care provided. Because of the high penetration of MCO contracts for patient care, orthopaedic surgeon income will continue to decrease. Such economic pressures will result in fewer orthopaedic surgeons willing to practice due to increasing retirement and retraining, as well as decreasing medical student interest in a specialty with the required time commitments and financial investments. Clark and Thurston also interestingly argue the effects of financial restraints on innovation. The creation of imperfect competition dampens the incentive to perform research or create innovative techniques.

Under current antitrust guidelines, Clark and Thurston note, physicians are prohibited from entering into meaningful collective bargaining negotiations with payers. As MCOs have eroded the market power of surgeons, government agencies have also reduced orthopaedic fees. Clark and Thurston note that any state would not want to give providers bargaining powers with MCOs or for any government-controlled reimbursement rate. Clark and Thurston note the limitations of any collective bargaining under current federal antitrust laws and predict an eventual decline in the number of orthopaedic surgeons with a concomitant slowdown of technological innovations.

■ COMMENT BY ROBERT C. SCHENCK, Jr., MD

Although this review may be considered gloom and doom, the past decade of decreasing revenue streams and increasing pressures on the physician give much credence to Clark and Thurston's concerns. From the supply side of orthopaedic surgeons, my experience with such financial pressures does affect medical student career preferences. Although orthopaedic surgery residencies continue to command a competitive field of medical student applicants, in my opinion, the financial pressures noted by Clark and Thurston has had an effect on student preferences. This effect could increase with time. As an aside, Clark and Thurston don't comment on other pressures of the supply side of orthopaedic surgeons. Medical training facilities suffer from increasing financial pressures as well. Academic medical centers routinely care for the sickest and poorest patients in the process of training tomorrow's physi-

cians.¹ Edward D. Miller, MD, dean/CEO of Johns Hopkins School of Medicine, recently noted five issues that must be addressed by our nation:

- The United States must introduce some type of universal health coverage. Uninsured patients have increased from 38 million to 44 million (16% of all Americans) over the past few years.
- The overhead for delivering care in this country must be reduced. Dealing with insurance companies is an expensive waste.
- Funding of graduate medical education (residency programs based at teaching hospitals) must be safeguarded.
- The nation's most advanced hospitals must be additionally reimbursed for the treatment they provide to the most severely ill patients.
- Reimbursement must include the cost of innovative technology and testing new drugs.

As physicians, we must not give up or give in. The problems of medical finances are complex and despite the gloom and doom, we must act. We need to educate our patients and politicians about the risks that current MCOs present for medical care. As Dr. Miller concludes, "The nation must decide if it is willing to pay the price for our institutions to maintain their positions as leaders in world medicine." ❖

Reference

1. Miller ED. A distress call from academic medical centers. *Hopkins Medical News* Winter 2000:56.

Posterior Inferior Capsular Shift for Posterior Subluxation of the Shoulder

ABSTRACT & COMMENTARY

Synopsis: *This is a retrospective chart review studying a surgical treatment for a difficult shoulder problem. The posterior-inferior capsular shift stabilized the instability in most of these shoulders.*

Source: Fuchs B, et al. Posterior-inferior capsular shift for the treatment of recurrent, volutar, posterior subluxation of the shoulder. *J Bone Joint Surg Am* 2000;82:16-25.

This is a retrospective chart review analyzing the success of a posterior capsular shift procedure to stabilize posterior shoulder instability. The inclusion cri-

teria included painful posterior instability affecting the activities of daily living, involuntary as well as voluntary posterior subluxation, and failure to respond to nonoperative management for three months. The exclusion criteria included a locked posterior dislocation requiring a reduction and patients with involuntary posterior subluxation demonstrated by apprehension without the ability to reproduce the posterior subluxation.

The chart review studied 26 shoulders in 24 consecutive patients who were an average age of 24 at the time of surgery. Psychiatric evaluation was obtained in two patients revealing no emotional disturbances. The operative technique was clearly described and involved a posterior approach with a repair of the posterior labral detachment (7 shoulders) and posterior-inferior capsular shift. Four shoulders also had glenoid osteotomies (3) or bone blocks (1) to improve excessive retroversion. The rehabilitation involved an initial period of immobilization followed by an exercise program. Five shoulders had six reoperations. Clinical, radiographic, and outcome data were recorded.

At an average follow-up of seven years, the patients estimated the surgically repaired shoulder to function at 86% of the other shoulder. The subjective result was good or excellent in 24 of 26 shoulders. All but one shoulder had excellent range of motion. Instability recurred in 23% and usually recurred in patients with previous surgery or with excess retroversion. Radiographs in six patients showed mild degenerative changes.

COMMENT BY JAMES R. SLAUTERBECK, MD

The management of posterior shoulder instability is a challenging problem. When a patient demonstrates voluntary posterior shoulder instability, one may be concerned about the patient's psychological problems complicating the postoperative care. This article illustrates this, as 19 of the 26 shoulders were referred to Fuchs and colleagues for care because of concern for psychiatric problems. However, after evaluation by Fuchs et al, only two patients needed an official psychiatric work-up and no emotional disturbances were noted. This suggests that a subset of the voluntary instability group may not have the significant psychological problems previously thought.

Multiple surgical procedures have been proposed for the treatment of posterior instability and most have a high recurrence rate. The surgical technique used by Fuchs et al was nicely described and addresses both the labral injury and the capsular laxity. This repair in these patients resulted in an overall subjective shoulder rating

of 86% compared to their normal shoulder and a low recurrence rate if this was the index posterior procedure.

I was surprised at the number of patients with an actual posterior labral injury since most of the patients did not report trauma as the initial event causing the instability. A possible cause for some of the poor results in the literature may be due to not addressing the posterior labral injury during surgical treatment.

Overall this is a good paper, which supports the idea of maximizing nonoperative treatment in voluntary subluxation of the shoulder. However, in cases where operative intervention is necessary, an anatomic approach to the shoulder repair addressing the pathology will give good results. The ability for patients to voluntarily sublux the shoulder was not associated with overt psychological tendencies and did not appear to affect the postoperative results. Patients with prior posterior shoulder surgery should be of more concern since these shoulders had a greater recurrence rate for instability. ❖

- b. subtle anterior glenohumeral laxity.
- c. throwing athletes.
- d. a tight coracoacromial arch.

34. Which of the following AC joint reconstruction techniques were weakest and least stiff?

- a. Coraco-acromial ligament transfer (Weaver-Dunn)
- b. Bosworth screw with bicortical fixation
- c. Coracoclavicular sling (polyester tape)
- d. Suture anchors

35. Imperfect competition is created by:

- a. MCOs and physician inability to collectively bargain.
- b. patients not knowing the value or quality of care.
- c. patient insulation of medical cost by third-party carriers.
- d. All of the above

36. All patients with posterior shoulder pain and posterior instability with activities of daily living in addition to voluntary shoulder subluxation require:

- a. a complete psychiatric work-up before surgery.
- b. an open, rather than arthroscopic, approach to regain stability of the shoulder.
- c. a combined anterior and posterior surgical approach to address all the instability in the shoulder.
- d. a thorough nonoperative trial because most will improve without surgery.

CME Questions

30. Which of the following variables was shown to correlate significantly with anterior knee pain after ACL reconstruction?

- a. Bone grafting the patella defect
- b. Bone grafting the tibial defect
- c. Closing the tendon defect
- d. Loss of extension

31. A clinical balance battery testing procedure in mild head-injured athletes found deficits in postural control:

- a. up to 10 days post-injury.
- b. up to seven days post-injury on a hard surface.
- c. the same as deficits found through laboratory measures of balance.
- d. up to three days post-injury on a foam surface.

32. The results of the current study indicate that:

- a. McConnell taping changes the knee biomechanics.
- b. McConnell taping may improve performance of patients with patellofemoral pain.
- c. McConnell taping increases VMO activity.
- d. McConnell taping showed no advantage when compared to the uninvolved extremity.

33. Internal, nonoutlet impingement of the rotator cuff is associated with all of the following except:

- a. undersurface rotator cuff fraying.

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