What Are Characteristic MRI Findings After Lateral Patellar Dislocation? 

Magnetic Resonance Imaging Characteristics of the Medial Patellofemoral Ligament Lesion in Acute Lateral Patellar Dislocations Considering Trochlear Dysplasia, Patella Alta, and Tibial Tuberosity–Trochlear Groove Distance.

Balcarek P, Ammon J, et al:

Arthroscopy 2010; 26 (July): 926-935

Patellar dislocation and medial patellofemoral ligament injury depends on a variety of factors.

**Background:** There are a number of different factors that are thought to play a role in patellar instability, including injuries to the medial patellofemoral ligament (MPFL), trochlear dysplasia, patella alta, and an increased tibial tuberosity-trochlear groove (TT-TG) distance.

**Objective:** To use MRI to assess injury patterns to the MPFL, trochlear dysplasia, patellar height, and TT-TG distance in patients suffering an acute lateral patellar dislocation (LPD), and to determine how these factors interact.

**Design:** Diagnostic case-control study. Level of Evidence IV.

**Methods:** MRIs were assessed for radiographic evidence of an acute LPD. Medical records of 73 patients were reviewed to ensure that they had an acute patellar dislocation. Patients’ MRIs were compared with those of 73 age- and gender-matched controls who had evidence of prior patellar dislocation or medial collateral ligament injury. MPFL disruption was evaluated on axial images for the femoral region, midsubstance, and patellar insertion. Patellar height was assessed using the Insall-Salvati ratio on sagittal images. Trochlear dysplasia was assessed on axial images. In addition, the TT-TG ratio was assessed.

**Results:** The authors found that 72 patients (98.6%) with a patellar dislocation had an injury to the MPFL. There were different sites of injury to the MPFL: femoral attachment, 50.0%; midsubstance, 13.9%; patellar insertion, 13.9%; combination insertion and patella, 22.2%; and combination MPFL and midsubstance, 4.2%. The authors looked at the subgroups of MPFL injury sites for statistical analysis. There was a complete MPFL rupture in 51.4% of cases. Complete tears were localized more often at the femoral insertion site. There was not a statistically significant correlation between complete and partial tears with respect to trochlear dysplasia, TT-TG distance, and trochlear asymmetry. The mean Insall-Salvati ratio was significantly higher in the study group than in the control group (1.21 vs 1.04). In the control group, 69.9% of patients had normal trochlear anatomy; in the study group, 74.0% had some form of trochlear dysplasia. TT-TG distance in the study group was statistically significantly higher than in the control group (12.75 vs 10.66). The authors found no difference between first-time and recurrent dislocators with respect to the parameters studied.

**Conclusions:** Patellar dislocation and MPFL injury depend on a variety of factors.

**Reviewer’s Comments:** This very detailed article shows that there is an interplay between patellar dislocation and a variety of other factors, including patella alta, trochlear dysplasia, and TT-TG distance. This raises the question of whether isolated MPFL reconstruction will optimally prevent recurrent instability. There may have been a selection bias in the study given its retrospective nature. It is not clear if all patients with a patellar dislocation seen at this clinic underwent MRI. (Reviewer-Nathaniel P. Cohen, MD).

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Keywords: Medial Patellofemoral Ligament Lesion, Patellar Dislocation, MRI

Print Tag: Refer to original journal article
There is still great variability in information presented on the Internet. Sites with the Health on the Net Foundation code seal of compliance with transparency and accountability have a higher transparency score and a higher content score.

**Background:** There has been an explosion of Internet use to access information about health care issues, but patients may not be getting accurate information.

**Objective:** To examine the content and quality of Internet-based information on 10 common sports medicine conditions.

**Design:** Evaluation of online information.

**Methods:** The authors looked at 10 different common sports medicine diagnoses. They developed a grading system containing 3 sections for each diagnosis. The first section evaluated the type of web site. The second section of the grading sheet assessed the quality of transparency of each web site based on the Health on the Net Foundation (HON) criteria. The authors also recorded whether the site displayed a banner indicating that they were HON code compliant. The third section was a 100-point scale used to evaluate the information on the web about the specific disease. The authors used the top 10 search results for each diagnosis in both Google and Yahoo, which the authors state account for 82% of all Internet searches in the United States. The authors excluded those sites that had no relevance to the diagnoses.

**Results:** Of all web sites evaluated, 74 were commercial, 32 were academic, 22 were physician or group sites, 7 were non-profit, 7 were news-related sites, 3 were personal views, and 9 were unidentified. Average HON score was 9.8 ± 3.6 points for reviewer #1, 9.5 ± 3.6 points for reviewer #2, and 8.5 ± 3.6 points for reviewer #3. Average content scores were 56.8 ± 21.6 points for reviewer #1, 56.0 ± 21.8 points for reviewer #2, and 54.8 ± 22.2 points for reviewer #3. The reviewers’ combined HON and content scores revealed that non-profit web sites had the highest HON and information content scores. There were 44 sites overall with a HON score of ≥12. They had an average content score of 67.95. The 110 sites with a lower HON score had an average content score of 51.10. Those sites that displayed the HON code seal had a statistically significantly higher HON score and content score than did those sites that did not have the seal.

**Conclusions:** There is still great variability in the information presented on the Internet. Sites with the HON code seal of compliance with transparency and accountability had a higher transparency score and a higher content score.

**Reviewer’s Comments:** This article highlights the fact that the quality of orthopedic information found on the Internet can vary greatly. When counseling patients about their diagnoses, I will usually direct them to sites, for example the American Academy of Orthopaedic Surgeons and the Arthroscopy Association of North America sites. It appears that the HON code seal is correlated with more transparency and better information. (Reviewer-Nathaniel P. Cohen, MD).

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Patients can have improved clinical outcomes and can return to their sport with a superior labrum anterior posterior tear that is treated nonoperatively.

**Objective:** To determine the outcome of superior labrum anterior posterior (SLAP) tears treated nonoperatively.

**Design:** Case series.

**Participants/Methods:** Over a 5-year period, the authors treated 371 patients with a SLAP tear. Inclusion criteria were tenderness at the bicipital groove, a positive O’Brien test, and MRI findings of a SLAP tear. All these patients were mailed a survey that included the Short Form 36 (SF-36), the European Quality of Life (EuroQol) measure, a simple shoulder test (SST), a visual analog scale (VAS), and the American Shoulder and Elbow Surgeons (ASES) score. Sixty-one surveys were returned without a forwarding address. Of the remaining 305 surveys, only 50 were returned; only 39 met full inclusion criteria. Of these, 20 patients failed nonoperative treatment and had surgical repair of their SLAP lesion. The remaining 19 patients were treated successfully for their SLAP tear and represent the study group. Nonoperative treatment included an NSAID and a physical therapy program that emphasized core strengthening, pericapsular and rotator cuff strengthening, in addition to a posterior inferior capsular stretching program using the cross-body adduction and "sleeper" stretch. Average number of therapy appointments was 18 (range, 4 to 40).

**Results:** Of those 20 patients treated successfully nonoperatively for their SLAP tear, at an average follow-up of 3 years, VAS decreased from 4.5 to 2.1, SST score improved from 8.3 to 11.0, ASES score improved from 58.5 to 84.7, and EuroQol improved from 0.76 to 0.89, all statistically significant. These same patients were able to return to athletic activity, with 71% at their pre-participation level. However, only 66% of overhead athletes were able to return to the same or higher level.

**Conclusions:** Patients with SLAP tears can be treated nonoperatively, with a reasonable expectation to return to an active lifestyle.

**Reviewer's Comments:** While this article suggests that some SLAP tears can be treated successfully nonoperatively, it doesn't provide any predictions of which patients may require surgery. The actual number of patients responding to the survey (50) may not be representative of the 371 patients evaluated. It would be interesting to compare these results with those of patients with SLAP tears who failed conservative therapy and had surgery. Did surgical patients have better results than those treated successfully nonoperatively? (Reviewer-John H. Wilckens, MD).

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Keywords: Superior Labrum Anterior Posterior Tears, Nonoperative Treatment

Print Tag: Refer to original journal article
A lateral retinacular release reduces the stability of the patella after acute medial patellofemoral ligament repair.

**Objective:** To determine the contribution of lateral retinacular release to patellar stability following medial patellofemoral ligament (MPFL) repair.  
**Design:** Controlled laboratory study.  
**Methods:** 8 fresh-frozen cadaveric specimens (average age, 72 years) were processed for testing with an 858 Mini Bionix load machine. Each specimen was tested at the following knee flexion angles: 0°, 15°, 30°, 45°, and 60°, measuring a laterally directed force on the patella that displaced the patella 1 cm. This series of testing was used as the control. Next, the MPFL was incised adjacent to its patellar insertion, then specimens were retested. Next the MPFL was repaired with 2 figure-of-8 No. 2 Ethibond sutures and then tested again. Finally, these same repaired specimens were retested after performing a lateral retinacular release.  
**Results:** The force needed to displace the patella laterally 1 cm in the native knee was 87.7 N at 0°, 90.0 N at 15°, 97.8 N at 30°, 102.9 N at 45°, and 102.3 N at 60°. When retested with the MPFL incised, forces needed decreased to 76.6 N at 0°, 74.8 N at 15°, 82.14 N at 30°, 83.8 N at 45°, and 80.0 N at 60°, which represented a reduction of 14% to 22%. When the MPFL was repaired, forces needed to displace the patella 1 cm laterally were minimally elevated over the native ligament. Finally, with a lateral retinacular release after a MPFL repair, the force was 85.0 N at 0°, 90.6 N at 15°, 93.9 N at 30°, 91.2 N at 45°, and 94.8 N at 60°, a decrease of 7% to 11%. This reached statistical significance at 45°.  
**Conclusions:** A lateral retinacular release did not improve patellar stability to lateral displacement after MPFL repair.  
**Reviewer’s Comments:** This study supports a growing body of evidence of the lack of utility of a lateral retinacular release in the treatment of acute patellar dislocations. This article contributes to the evolution of the historical surgical treatment of acute patellar dislocations from lateral retinacular release, to MPFL repair and lateral release, to MPFL repair alone. In the treatment of chronic patellar instability, or instability and malalignment, lateral retinacular release may provide some benefit. (Reviewer-John H. Wilckens, MD).

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**Keywords:** Medial Patellofemoral Ligament Repair, Patellar Stability

**Print Tag:** Refer to original journal article
During shoulder arthroscopy, special care should be exercised in establishing the anteroinferior portal, or the 5-o'clock portal, to avoid neurologic injury.

**Background:** Overall, shoulder arthroscopy is safe. A greater number of shoulder conditions in a greater number of patients are being treated with shoulder arthroscopy. However, complications with shoulder arthroscopy do occur.

**Objective:** To review complications of shoulder arthroscopy.

**Design:** Literature review. **Positioning & Anesthesia:** Shoulder arthroscopy can be performed in the lateral decubitus position or beach chair position. Each position has its attendant risks. In the lateral decubitus position, traction should be limited to 15 to 20 pounds, in 45° forward flexion with 0° to 90° abduction. Internal rotation reduces brachial plexus strain. Despite greater anesthesia access in the beach chair position, anesthesia-related and airway complications including spinal and cerebral ischemia and death are more common in this position. Impaired venous return and hypotensive anesthesia may contribute to this. Interscalene blocks are commonly used for shoulder arthroscopy and carry a complication rate of 0.7% to 4.0% to include pneumothorax, seizure, hematoma, respiratory distress from phrenic nerve involvement, complex regional pain syndrome, and peripheral neuropathy. **Chondrolysis:** Chondrolysis after shoulder arthroscopy appears to be a multifactorial problem. Most often implicated are thermal devices and intra-articular anesthetics, in particular postoperative pain pumps. Also contributing to this complication are chondral injury, instability, bioabsorbable implants, and young age. Patients present 3 to 12 months after surgery with deep pain, loss of motion, and loss of joint space. **Neurologic Complications:** Nerve injury from shoulder arthroscopy is reported to be ≤3.0% to 0.2%; most are transient. Positioning, traction, portal placement, fluid distention, and extravasation have all been implicated. Neurovascular structures are most at risk during placement of anterior portals, in particular, the 5-o-clock anteroinferior portal. In the beach chair position, the axillary nerve is 12 to 33 mm away, and the musculocutaneous nerve is 18 to 28 mm away. In the lateral decubitus position, these structures are closer. The axillary nerve is only 10 to 25 mm away from the 6-o-clock position of the glenoid rim. Standard posterior and Neviaser portals are safer. **Infection:** The infection rate for a shoulder arthroscopy is between 0.16% and 1.9%. Patients present with drainage and erythema. Superficial infections can be treated with antibiotics, whereas deep infections may require multiple debridements and prolonged IV antibiotics. Special care should be taken to culture for propionibacterium acnes. **Thromboembolic Complications:** Thromboembolic events are rare in shoulder arthroscopy, with a hypercoagulable state being the biggest risk factor.

**Conclusions:** Thermal devices and intra-articular anesthetics should be used with extreme caution in shoulder arthroscopy to avoid chondrolysis.

**Reviewer's Comments:** This is a very balanced, easy-to-read update on complications of shoulder arthroscopy. Like most surgical complications, vigilance and attention to detail will go a long way to reduce their incidence. The discussion of neurovascular injury and portal placement is a must read. The bibliography is exhaustive. (Reviewer-John H. Wilckens, MD).

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Keywords: Shoulder Arthroscopy, Complications

Print Tag: Refer to original journal article
Several surgical and nonsurgical options exist for the active patient with symptomatic knee osteoarthritis besides total knee arthroplasty.

**Objective:** To review the literature for treatment options for young, active patients with symptomatic knee osteoarthritis.

**Design:** Review article. **Nonsurgical Options:** Aerobic exercise improves long-term functional outcomes, whereas strength training improves impairment-related outcomes such as pain and gait. Lateral heel wedges can improve symptoms of medial compartment arthritis by reducing varus moment and medial compartment load. Patients with intact collaterals and <10° varus or valgus alignment have benefited from bracing that reduces loads in the affected medial or lateral compartment. There is no clear choice of one NSAID over another, and prescriptions should be based on patient compliance, cost, relative safety, and physician experience and preference. Cyclooxygenase-2 inhibitors reduce but do not eliminate gastrointestinal complications. Intra-articular injections include cortisone and viscosupplementation. While corticosteroids are potent anti-inflammatory agents, with lidocaine they may be cytotoxic to chondrocytes. While there is growing evidence of viscosupplementation, there is no demonstrated efficacy of one compound over another, and very similar efficacy to NSAIDs. **Surgical Management:** Arthroscopic treatment for osteoarthritis shows no benefit over placebo surgery. Additionally, 1 study revealed that, of patients who had initial relief, 15% had a total knee arthroplasty within 1 year after surgery, and only 44% had significant reduction in pain. However, these results improve if the patient had medial joint line pain and an unstable meniscus tear. Even in properly selected patients, only 82% had a reduction in pain, 14% had no change, and 4% had an increase in symptoms. High tibial osteotomy has evolved and continues to be a good solution for single compartment disease and age <55 years. The 10-year survival rate is 82%, and the 15-year rate is 45%. Uni-compartment knee arthroplasty has also improved. The Hospital for Special Surgery recently published an 11-year study showing a 92% survival rate; all patients were pleased with their surgery, only 3 required revision. Total knee arthroscopy (TKA) continues to be an excellent option, with 90% survivorship at 10 to 15 years. While most patients are cautious after TKA due to recommendations of their surgeons, 12% are not but did not demonstrate increased failure or complications.

**Conclusions:** Young, active patients with knee osteoarthritis have several nonsurgical and surgical options that will improve their symptoms and allow them to continue an active lifestyle.

**Reviewer’s Comments:** This is a very easy-to-read article with balanced practical information that is helpful in treating the all-too-common active or young patient with osteoarthritis of the knee. As physicians, it is important to keep these patients as active as possible. One of the worse prognostic conditions for knee osteoarthritis or TKA is obesity. Improving knee extension and core strength have been 2 interventions that I have found helpful in treating these difficult patients. Any arthroscopy with these patients should include a discussion of expectations. (Reviewer-John H. Wilckens, MD).

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Keywords: Knee Arthritis, Active Patients

Print Tag: Refer to original journal article
Are Antibiotics Needed for All Hand Surgeries?

A Prospective Trial on the Use of Antibiotics in Hand Surgery.

Aydin N, Uraloglu M, et al:

Plast Reconstr Surg 2010; July 15 (): epub ahead of print

No significant benefit from perioperative antibiotics over placebo for healthy patients undergoing hand surgery that lasts <2 hours.

**Objective:** To determine the usefulness of antibiotics for hand surgery procedures.

**Design:** Prospective, randomized, double-blind placebo-controlled study.

**Participants:** 1340 patients were stratified into 4 groups. Group 1 (n=400) had surgery limited to skin and subcutaneous tissue; group 2 (n=410) had surgery of tendons, nerves, arteries, and other soft tissues; group 3 (n=380) had surgery involving bones and/or joints; and group 4 (n=150) had surgery for defects of soft tissue and bone. Elective and emergency patients were included in all 4 groups. Patients with diabetes or other immunosuppressive diseases and bite wounds were excluded.

**Methods:** Patients were randomized such that half received antibiotics and half received placebo. For those receiving antibiotics, Ancef, 2 g IV, was given prior to tourniquet inflation and every 4 hours for 24 hours after surgery. Cultures were taken for all patients prior to administration of antibiotics or placebo. All patients had daily dressing changes postoperatively. Postoperative infection was defined as purulent drainage or fistulae in the zone of operation, and cultures confirmed infection. Infections were treated as the surgeon and infectious disease team saw fit.

**Results:** Overall, there was a 3.4% infection rate in the placebo group and a 3.1% rate in the antibiotic group, which was not a statistically significant difference. There were also no statistically significant differences in infection rates between antibiotic or placebo administration within each group. There was no difference in infection rates between elective or emergent surgery patients. There was no significant difference in infection rates between placebo and antibiotic administration for surgeries lasting >2 hours, those with dirty and/or crush injuries, or those that had implants/hardware inserted.

**Conclusions:** There is no difference in the infection rate for hand surgery patients receiving perioperative antibiotics versus placebo. These findings do not apply to patients with diabetes or other medical comorbidities who were excluded from the study. Low numbers and unequal distribution of patients requiring free flaps prevented conclusions with regard to antibiotics for surgeries lasting >2 hours.

**Reviewer’s Comments:** This large, prospective randomized trial is a great effort to further define the role of prophylactic antibiotics in hand surgery. The authors did not mention antibiotic allergy or if any changes were made based on allergy. There was no distinction between superficial or deep infections or whether infections required antibiotics alone or further surgery for resolution. There was no discussion of surgical treatment/findings for those patients who developed infection. I think these shortcomings are outweighed by positives that the study brings to the field. Overall, this study supports the current trend to not give perioperative antibiotics for hand surgery that requires <2 hours and for those patients without significant medical comorbidities. I tell patients that, in these situations, the risk of receiving antibiotics likely outweighs the benefit. (Reviewer-Kenneth R. Means, Jr, MD).

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Keywords: Antibiotics, Hand Surgery

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Obesity Increases Risk of Recurrence After Lumbar Discectomy

Obesity Increases the Risk of Recurrent Herniated Nucleus Pulposus After Lumbar Microdiscectomy.

Meredith DS, Huang RC, et al:

Spine J 2010; 10 (July): 575-580

Obesity (body mass index >30) appears to elevate the risk of recurrence after lumbar discectomy.

**Background:** Recurrent disc herniation is a common complication of lumbar discectomy and occurs in 5% to 11% of cases. Obesity has been linked to poorer outcomes after spine, orthopedic, and general surgery. No previous study, however, defined a relationship between obesity and risk of recurrent lumbar disc herniation. **Design:** Retrospective review. **Participants/Methods:** Patients who underwent 1- or 2-level lumbar discectomy by 1 surgeon at a single institution were analyzed. All patients had standard indications for lumbar discectomy including symptomatic disc herniation that failed conservative treatments and that had been confirmed by MRI. The surgical procedure included removal of only loose or extruded fragments of the disc and leaving stable fragments of the nucleus within the disc space. Postoperative MRI was obtained only if patients had recurrent or persistent radicular symptoms. Repeat discectomy was performed if there was evidence of recurrent disc herniation that was symptomatic and refractory to conservative measures. Obesity was defined as a body mass index (BMI) ≥30. **Results:** 75 patients underwent the procedure and were followed for at least 6 months. All patients have had a radiculopathy-free interval of time. Postoperative MRI was obtained on 32 patients, and 8 were found to have recurrence (10.7%). Four of these patients (5.3%) failed conservative care and underwent repeat discectomy from 4 to 6 weeks after initial surgery. The data analysis showed that patients who had recurrent herniation and repeat discectomy had significantly greater BMIs (>30 in both cases). Patients with a BMI >30 were 12 times more likely to have a recurrent disc herniation and 30 times more likely to undergo revision discectomy. **Conclusions:** There was a significant difference in BMI between patients who had recurrent disc herniations and those who had not, and obesity was a significant risk factor for the recurrence and revision operation. The authors admitted that the study was limited by a small number of patients, by the fact that all operations were performed by a single surgeon in a single institution, and by the retrospective nature of the study. They suggested that weight loss counseling should be included in the preoperative discussion with an obese patient. **Reviewer's Comments:** The study has several significant limitations including small sample size, single surgeon and technique, short follow-up time, and retrospective analysis. A large, multicenter prospective study comparing several discectomy techniques would be very helpful. Nevertheless, this study confirms what has been known intuitively and anecdotally, as well as suggested by biomechanical studies -- greater stress on the disc in an obese patient increases their risk of re-herniation, among other detrimental effects brought on by excessive body weight. Weight loss should be encouraged in all obese patients to improve their outcomes. (Reviewer-Vladimir Sinkov, MD).

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Keywords: Obesity, Symptomatic Recurrent Lumbar Disc Herniation, Risk Factors

Print Tag: Refer to original journal article
CT scan use is becoming more and more common in routine medical screening. For instance, many trauma protocols involve routine axial screens for patients when the physical exam or symptoms are questionable.

**Objective:** To quantify the radiation dose in actual practice associated with musculoskeletal CT scanning of specific body regions.

**Methods:** Scans performed at Yale University Hospital in 2007 were reviewed. Twenty scans of each anatomic region were selected: shoulder, elbow, and wrist; hip, knee, and ankle; and cervical, thoracic, and lumbar spines were studied. The machine manufacturer and settings as well as patient height and weight were obtained. The effective dose was calculated by combining the organ dose of relevant regions multiplied by the tissue-weighting factor. This tissue-weighting factor represents the contribution of different organ systems to the overall radiation risk. For instance, gonads have the highest tissue-weighting factor. A CT dosimetry spreadsheet was used to calculate effective doses for each scan.

**Results:** The highest effective doses were in the axial skeleton, of which the lumbar spine had the greatest dose, followed by the thoracic and cervical spines. Doses here were 19, 17, and 4 mSv, respectively. The equivalent number of chest x-rays to achieve a comparable dose was 240 for the lumbar spine. For reference, the dose from a chest radiograph is roughly equivalent to that absorbed in a round trip airplane flight from London to New York. The abdomen, chest, and pelvis CTs had the next highest doses. CT scans of the appendicular skeleton had much lower doses, and a knee CT scan has a dose of only 0.17 MSv, 1/100th of that of the lumbar spine, and wrist and ankle studies had less than half that dose. It should be noted that the elbow CT scan produced a much lower dose when the elbow was held away from the trunk instead of next to the trunk.

**Conclusions:** The authors provide a nice discussion of dose calculations and risks. They state that the average exposure of a person to ambient radiation during a year of life on the ground is equivalent to 30 chest radiographs. They further state that children are felt to be more radiosensitive than adults. They quote prior estimates of lifetime increased cancer risks to a child from an abdominal CT scan as one fifth of 1%. They also compare the radiation dose of a CT scan of the thoracic and lumbar spines to that of a scan of the chest or abdomen, despite the fact that they involve similar tissue volumes.

**Reviewer’s Comments:** I found this article very informative. In view of recent articles on radiation risk that have attracted the attention of the popular press, I believe we need to be more cautious in ordering CT scans of the axial skeleton. There should be a clear clinical need. I expect that techniques will become available to decrease these doses in the future. Also, long-term follow-up of patients who have had imaging exposures in the higher end will be valuable to correlate with the data given here. (Reviewer-Paul D. Sponseller, MS, MD).
Multiple hereditary exostoses or osteochondromas are among the most common bone tumors.

**Objective:** To determine the true prevalence of intraspinal osteochondromas.

**Participants/Methods:** All patients (n=44) at the Salt Lake City Shriners Hospital in Salt Lake City, UT, with multiple hereditary exostoses (MHE) were studied between 2006 and 2009, after 3 patients presented with symptomatic intraspinal lesions. Of patients, 26 were males and 18 were females, with a mean age of 12.9 years. They were studied with plain films and MRI of the entire spinal column.

**Results:** 68% of patients had an exostosis in the spine. Twelve patients (28%) had a lesion that was encroaching on the spinal canal. None of these were accurately shown on plain films. The authors show several convincing sets of images in which plain films look unremarkable, but there is a significant mass effect on MRI with a lesion displacing the spinal cord. Two of the initial 3 symptomatic patients had incomplete recovery of their paraplegia. None of the subsequently screened patients had neurologic compromise. Males were more likely than females to have a lesion that was encroaching on the spinal canal. Nearly half the males in this series had such a lesion, compared with 20% of females. The most common region of lesions encroaching into the spinal canal was cervical, and C2 was the most common vertebra. There was only 1 lumbar lesion in the whole series. There were 8 lesions arising from the lamina and 4 arising from the vertebral body. Two of 12 patients had 2 non-contiguous lesions encroaching in the spinal canal. The youngest patients with encroaching lesions were aged 4 and 5 years. Six patients underwent surgery to remove lesions that were indenting the dural tube. There were no complications of this surgery.

**Conclusions:** The authors recommend routine imaging of patients with MHE. They recommend pan-spinal MRI in order to minimize radiation dose and to show the dural tube accurately. They recommend doing this when the patient is old enough to undergo MRI without requiring general anesthesia, usually during early elementary school years. They further recommend removing lesions that are displacing or indenting the dural tube.

**Reviewer’s Comments:** The authors have nicely shown that you cannot depend on plain films to rule out intraspinal lesions of osteochondromas. I chose to include this article because of the potential devastating clinical impact of intraspinal lesions. I believe routine MRI screening is a good idea until we get a better idea of the true incidence of problem lesions. I personally have not found one. Since neurologic damage is related more to growth than to motion, it makes most sense to screen before the growth spurt. It would be interesting to see if there is a correlation with EXT1 versus EXT2. I recommend this article to all who take care of children or patients with MHE. (Reviewer-Paul D. Sponseller, MS, MD).

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Keywords: Multiple Hereditary Exostoses, Spine Involvement

Print Tag: Refer to original journal article
NSAIDs are commonly prescribed in orthopedic surgery for inflammatory conditions.

Objective: To weigh the literature and make specific recommendations on NSAID use where there is enough evidence. I thought this review would be of interest to all orthopedic surgeons, so I will summarize it.

Discussion: NSAIDs are commonly prescribed in orthopedic surgery for inflammatory conditions. Effects on bone healing however, have tempered their use in fracture healing, spine fusion, and some arthroplasty situations. NSAIDs have in common the ability to inhibit prostaglandin production. The first enzyme in this pathway is cyclo-oxygenase (COX). There are 2 forms of COX. COX-1 regulates many normal cellular maintenance processes and COX-2 is part of the inflammatory system. The broad class of nonspecific NSAIDs inhibits both enzymes. However, unwanted gastric side effects are attributed to COX-1 inhibition, whereas the beneficial effect on reducing inflammation results from COX-2 inhibition. Prostaglandin E2 (PGE2) increases bone formation and bone mass. Conventional NSAIDs can decrease heterotopic ossification. All NSAIDs interfere with the process of fracture healing. COX-2 NSAIDs are less than half as potent at inhibiting PGE2 levels in fracture healing. COX-2 inhibitors may have less of an effect, but they still have been found to cause some delay in fracture healing. These effects seem to be both dose- and time-dependent, and inhibition is most prominent in the early or inflammatory phases of fracture repair. The authors recommend avoiding NSAIDs after fractures that are associated with an increased risk of nonunion. Another topic the authors reviewed was the effect of NSAIDs on spine fusion. They reviewed a number of basic as well as clinical studies. They found that there is no consensus in the literature to say that COX-2 inhibitors have an effect on spinal fusions. However, nonspecific NSAIDs do seem to increase the risk of non-healing of spine fusion and should be used sparingly in this situation. The authors believe that these effects are mediated by COX-1 inhibition. The effect of NSAIDs on integration of tissue ingrowth after joint arthroplasty is also significant. Bone ingrowth has been shown to be suppressed by COX-2 inhibitors, especially in the early stage after implantation. On the other hand, COX-2 drugs can decrease the risk of aseptic loosening of uncemented implants and may be beneficial in later stages. There is also a body of literature looking at use of NSAIDs after soft tissue injury. COX-2 inhibitors may be valuable in protecting skeletal muscle after injury. However, they may impair tendon repair.

Conclusions: COX-2 inhibition appears less detrimental to orthopedic procedures than does COX-1 inhibition. In most cases, COX-2 inhibitors do not work at cross-purposes to orthopedic procedures.

Reviewer's Comments: Hopefully, further well-done clinical trials will help to further investigate these issues. Because of the increased attention that is being given to nonsteroidal effects, I recommend this review to all orthopedic surgeons who perform spine fusion, joint arthroplasty, or osteosynthesis. (Reviewer-Paul D. Sponseller, MS, MD).

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Keywords: NSAIDs

Print Tag: Refer to original journal article
Patients with Loeys-Dietz syndrome commonly present to the orthopaedic surgeon with cervical malformations, spinal and foot deformities, and findings in the craniofacial and cutaneous systems.

**Objective:** To report musculoskeletal demographic, clinical, and imaging findings of Loeys-Dietz syndrome to aid in its diagnosis and treatment.

**Participants/Methods:** All patients with Loeys-Dietz syndrome seen at the Johns Hopkins Medical Institutions over 2 years were reviewed. In total, 65 patients were identified. Clinical and imaging data were obtained and studied.

**Results:** Mean age was 21 years, and more than half of patients were children. Many patients had previously been labeled with other diagnoses, most commonly Marfan syndrome (16 patients) and Ehlers-Danlos syndrome (2 patients). The most distinctive visible characteristic was hypertelorism. Upon opening the mouth the examiner may detect a cleft palate or a broad or bifid uvula. Blue sclera is seen in nearly one third of patients. The most pathognomonic radiographic finding was upper cervical laxity/instability and midline defect. Cervical spine findings were present in 19 patients. The most common skeletal finding was pectus excavatum or carinatum in 43 of 65 patients. The next most common was scoliosis in nearly half (30) of patients but only 4 patients had required scoliosis surgery thus far. More than two thirds of patients had dural ectasia. Cases of atlanto-axial rotatory instability, C1 to C2 flexion instability, and C2 to C3 subluxation were also seen. Eleven patients had clubfeet. After surgery they tended to develop overcorrection into significant valgus of the hindfoot. Significant finger flexion contractures often present in infancy but some improve with age. Occurrence of thumb and wrist signs together was seen in about 25% of patients. Limbs tend to be hyperextensible, especially the knees. Ankle valgus often occurs as well. Acetabular protrusion was found in about one fourth of patients and was usually mild. Osteopenia was also seen and several patients had pathological fractures. Other highly informative features included a cleft palate, thin skin, and diffuse joint laxity. All patients were treated medically to minimize aneurysm progression, and many had undergone aortic surgery.

**Conclusions:** Loeys-Dietz syndrome has many features in common with Marfan syndrome and Ehlers-Danlos syndrome. The similarities to Marfan syndrome derive from the fact that both have an influence on TGF-beta signaling. However, it is recognizable due to the combination of hypertelorism, bifid uvula, cleft palate, clubfeet, knee laxity, and cervical or thoracolumbar deformity. Genetic testing is readily available to confirm the diagnosis. Aneurysms should be treated by close monitoring, medical prophylaxis, and appropriate surgery.

**Reviewer's Comments:** This is an important syndrome to be aware of. The implications of diagnosis can be life-saving. I think it will be recognized quite commonly. I personally have diagnosed 3 patients from my pediatric orthopedic practice who have been confirmed with Loeys-Dietz syndrome. (Reviewer-Paul D. Sponseller, MS, MD).

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Keywords: Loeys-Dietz Syndrome, Diagnosis, Treatment

Print Tag: Refer to original journal article
The presence of Hill-Sachs lesions suggests that spontaneously reducing dislocation events may have occurred -- and these injuries should be described as transient luxations.

**Background:** The pathology of acute, traumatic glenohumeral dislocation has been well studied and consists primarily of avulsion of the anteroinferior aspect of the glenoid labrum and the capsular attachments from the glenoid rim. Subluxation events, however, have not been well studied, even though they occur much more frequently than dislocations.

**Objective:** To determine the pathoanatomy associated with first-time, traumatic, anterior glenohumeral subluxation events with use of patient history, physical examination, radiographs, MRI studies, and surgical findings.

**Design:** Retrospective cohort study.

**Methods:** All shoulder instability events that occurred over one academic year at the authors' institution were tracked. Shoulder subluxation events were defined as incomplete instability events not requiring a manual reduction maneuver by a medical professional. Anterior instability was diagnosed in any patient experiencing a painful shoulder event with a sensation of transient instability who, on physical examination, had anterior apprehension, relief with relocation, and/or pathologic anterior translation on load-shift testing. Only first-time, traumatic events were included. Only patients with an MRI and radiographs within 2 weeks of the injury were included. Patients were offered arthroscopic labral repair if a Bankart lesion was seen on the MRI.

**Results:** 27 patients met the inclusion criteria. There were 22 men and 5 women with a mean age of 20 years (range, 18 to 24 years). MRI revealed 6 osseous Bankart lesions and 20 soft-tissue Bankart lesions. A Hill-Sachs lesion was visible on MRI in 25 of 27 patients. Ten patients opted for surgical treatment within 3 months after the initial subluxation event. An additional 4 patients resumed activity but elected to have operative treatment after experiencing pain and recurrent instability. Only first-time, traumatic events were included. Only patients with an MRI and radiographs within 2 weeks of the injury were included. Patients were offered arthroscopic labral repair if a Bankart lesion was seen on the MRI. A Hill-Sachs lesion was visible on MRI in 25 of 27 patients. Ten patients opted for surgical treatment within 3 months after the initial subluxation event. An additional 4 patients resumed activity but elected to have operative treatment after experiencing pain and recurrent instability. All but one of the Bankart lesions documented on MRI were confirmed in patients treated surgically. That patient had scuffing of the labrum but no separation. Only 7 of 25 Hill-Sachs lesions seen on MRI had surgical confirmation of the injury, including 2 seen on plain x-rays.

**Conclusions:** A high rate of pathologic changes is seen with first-time, traumatic, anterior subluxation events. The presence of Hill-Sachs lesions suggests that spontaneously reducing dislocation events may have occurred -- and these injuries should be described as transient luxations. Following a clinical subluxation event, MRI may be helpful prognostically given the high rate of pathologic changes seen in this study.

**Reviewer's Comments:** This is an important study documenting the high rate of anteroinferior labral pathology and Hill-Sachs changes associated with presumed glenohumeral subluxations. The authors point out that many of these events may actually be transient luxations and that MRI can be used to guide the treating physician. The MRI findings of humeral head changes were not reliably reproduced during arthroscopic examination. (Reviewer-Carl H. Wierks, MD).

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Keywords: Glenohumeral Subluxation, Traumatic

Print Tag: Refer to original journal article
Chondral Resurfacing and High Tibial Osteotomy in the Varus Knee: Survivorship Analysis.
Sterett WI, Steadman JR, et al:
Am J Sports Med 2010; April 7 (): epub ahead of print

Survivorship of a combined high tibial osteotomy/microfracture procedure for varus osteoarthritis is 97% at 5 years and 91% at 7 years.

**Background:** Patients with varus osteoarthritis who wish to remain very active can be difficult to manage. A combined approach of microfracture and unloading osteotomy may be helpful in this population.

**Objective:** To document survivorship of combined microfracture and medial opening wedge high tibial osteotomy (HTO) over time, patient satisfaction, and functional outcomes.

**Design:** Case series; level of evidence, 4.

**Methods:** An open-wedge HTO and microfracture was performed on 106 knees by a single surgeon. Patients were included if (1) medial chondral degeneration was present; (2) varus malalignment was present, in which the patients' weightbearing axis measured >50 of varus or their weightbearing line fell in the medial third of the tibial plateau, or the weightbearing axis was not fully in the medial third of the tibia but the entire meniscus had been previously excised; and (3) the chief complaint was medial-sided knee pain. Lysholm scores, Tegner activity levels, and patient satisfaction scores were recorded pre- and postoperatively. Failures were any patient who did undergo a total knee replacement after the initial microfracture and HTO procedure.

**Results:** 12 of 106 knees underwent knee arthroplasty at an average of 81.3 months (range, 19.3 to 116.5 months) after the index procedure. Mean age at arthroplasty was 60 years (range, 46 to 70 years). Patients with medial meniscus lesions at the time of the combined procedure were 9.2 times more likely to undergo arthroplasty than those without medial meniscus lesions (95% confidence interval [CI], 1.4 to 13.5; \( P = 0.015 \)). Survivorship was 97% at 5 years and 91% at 7 years. Mean survival time was 71.3 months (95% CI, 26 to 135 months). Lysholm and Tegner scores decreased as years from surgery increased; however, patient satisfaction remained steady.

**Conclusions:** Patients with medial compartment osteoarthritis, varus malalignment, and medial-sided knee pain, who want to remain at high activity levels, are excellent candidates for microfracture with HTO. Treatment with combined microfracture and medial opening wedge HTO appears to postpone knee arthroplasty. Patient satisfaction was high in this study, and Lysholm scores significantly improved after this procedure.

**Reviewer's Comments:** Despite the success of knee arthroplasty, it may not be the ideal surgery for patients who wish to remain very active. This article provides survivorship data that can be used to counsel patients on how long they may be able to delay knee arthroplasty. The authors suggest that the patients in this study would have undergone total knee replacement at the time of initial presentation if not offered the combined HTO/microfracture procedure, but the inclusion of a control group in this study would have made the results much more poignant. (Reviewer-Carl H. Wierks, MD).

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Keywords: High Tibial Osteotomy, Microfracture, Arthroplasty

Print Tag: Refer to original journal article
Axial alignment plays a role in osteochondritis dissecans, but many patients are within physiologic range.

**Background:** Osteochondritis dissecans (OCD) is a relatively rare condition that typically occurs in the knee, most frequently in the medial femoral condyle. Consensus does not exist as to the cause of OCD.

**Objective:** To analyze whether mechanical alignment of the leg is related to the localization of femoral condyle OCD.

**Design:** Case series; level of evidence, 4.

**Methods:** A retrospective analysis of patients treated for OCD at a single institution was performed. Patients were categorized into 2 groups depending on whether the medial or lateral femoral condyle was involved.

**Results:** 93 patients with OCD of the femoral condyle in 103 knees were identified. Overall, 79% were on the medial femoral condyle and 21% were on the lateral femoral condyle. In addition, there were 3 cases located on the femoral trochlea and 4 cases on the patella. Mean age at diagnosis was 22 years. Evaluation of axial alignment according to the method of Fujisawa was done separately for the lateral and medial OCD group using full-leg standing radiographs. The mean position of the mechanical axis in cases with lateral OCD was found to be at 13% ± 3.9% in the lateral compartment, which significantly differed from a perfect centered mechanical axis at 0% ($P=0.012$). Cases with medial OCD showed a mean mechanical axis in the medial compartment at 28% ± 2.8% ($P<0.001$). The presence of an open versus a closed epiphyseal growth plate did not affect the location of the mechanical axis.

**Conclusions:** The findings of this study indicate that there is an association between valgus alignment and lateral condyle OCD and varus alignment and medial condyle OCD. This evokes higher loading of the affected than of the unaffected knee compartment, and therefore, axial alignment may be a cofactor in OCD of the femoral condyles. However, the amount of valgus or varus is generally slight, and many patients are within the physiological range of alignment.

**Reviewer's Comments:** This study provides clinical evidence to support the theory that lower extremity alignment plays a role in the development of OCD lesions. I was surprised at how small the difference was in axial alignment between the affected and normal knees. Because of this, I question the utility of a corrective osteotomy in this group. (Reviewer-Carl H. Wierks, MD.)

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**Keywords:** Osteochondritis Dissecans

**Print Tag:** Refer to original journal article
In this study, instituting a formal smoking cessation program decreased the number of patients who experienced a postoperative complication after undergoing surgery for acute fractures.

**Background:** There are no studies evaluating the effect of a smoking cessation program on the complication rate following acute surgical treatment for fractures.

**Objective:** To determine whether a smoking cessation intervention, started during the acute hospitalization and continuing for 6 weeks, affects the number of patients with complications following surgical treatment for acute fractures.

**Design:** Single-blinded randomized controlled multi-center trial.

**Methods:** Between February 2004 and December 2006, 105 smokers who sustained an acute traumatic fracture and required an acute surgical procedure were enrolled in the study. Patients were randomized into the control group (n=55; 37 women and 18 men; mean age 51.5 years) or the intervention group (n=50; 36 women and 14 men; mean age 54.7 years). The intervention group included a formal smoking cessation program and free nicotine substitution to those who needed it. All patients were followed at regular intervals for between 6 and 12 weeks postoperatively. The treating orthopedic surgeon and study nurses who performed follow-up evaluations were blinded to the allocation. The primary outcome measure was the number of patients with at least one postoperative complication. Complications were defined as any unexpected event causing additional treatment, additional testing, prolonged hospitalization, or unscheduled follow-up visits.

**Results:** Fractures included fractures of the ankle (n=54), hip (n=22), tibia (n=9), upper extremity (n=18), and foot (n=2). In total, 38% of patients in the control group versus 20% of patients in the intervention group sustained at least one postoperative complication (P <0.05). Sixteen patients in the control group and 9 patients in the intervention group sustained one complication (P <0.05); 5 patients in the control group and 1 patient in the intervention group sustained 2 complications (P <0.05). The most common complications include superficial wound infection (n=15) and cast-related complications (n=7). Although both of these were more common in the control group, these differences were not statistically significant (P >0.05). The odds of having a complication were 2.51 times higher in the control group as compared to the intervention group (P >0.05). Only 24 patients in the intervention group reported total abstinence from smoking at 2 weeks.

**Conclusions:** Even though less than half the patients were compliant with smoking cessation, this study shows that a formal smoking cessation program decreases the risks of postoperative complications following acute fracture surgery.

**Reviewer's Comments:** This study is limited by the fact that compliance with smoking cessation was not able to be accurately quantified. In addition, the clinical significance of some of the complications reported is questionable. Despite these limitations, this study provides evidence confirming the benefit of offering a smoking cessation program to patients undergoing surgery for acute fractures. Such an intervention program should be recommended to all patients undergoing surgery for acute fractures. (Reviewer-Adam J. Farber, MD).

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Keywords: Fractures, Surgery, Smoking, Smoking Cessation, Complications

Print Tag: Refer to original journal article
Medial meniscal radial tears up to 60% of the rim width do not affect the size or location of peak contact pressure along the medial tibial plateau.

**Background:** Radial meniscal tears are common. It is unknown if there is a critical tear size that is associated with significant alterations in contact pressure in the ipsilateral compartment. This information would be useful to guide surgeons as to the appropriate management of radial tears.

**Objective:** To measure the contact pressures transmitted to the medial tibial plateau under dynamic physiological loads in intact knees, in knees with different size radial tears, following meniscal repair, and following partial meniscectomy.

**Design:** Biomechanical cadaveric study.

**Methods:** 8 fresh frozen cadaveric knees (8 females; mean age, 61.3 years) with no ligamentous or meniscal pathology were utilized in this study. All knees were mounted onto a 4-station load-controlled knee joint simulator that could be programmed to dynamically control axial and translational forces as well as rotational moments. The contact pressure and location on the medial tibial plateau were measured in 6 different conditions: (1) intact knee, (2) 30% radial medial meniscus tear, (3) 60% radial medial meniscus tear, (4) 90% radial medial meniscus tear, (5) after meniscal repair using inside-out sutures, and (6) following partial medial meniscectomy. Measurements were made in all specimens at 2 different points of the gait cycle: (1) at 14% of the gait cycle with the knee in 15° of flexion and (2) at 45% of the gait cycle with the knee in 8° of flexion.

**Results:** There was no statistically significant difference in mean or peak contact pressure among the intact meniscus, radial tears involving up to 90% of the rim, and following meniscal repair. The mean contact pressure after partial meniscectomy was statistically significantly higher than any of the other 5 testing conditions ($P<0.05$). When the location of the peak contact pressure along the medial tibial plateau was assessed, radial tears involving 90% of the meniscal rim resulted in a postero-central shift; smaller tears did not affect location of peak contact pressure. Meniscal repair did not restore the location of peak contact pressure to that of the intact knee. Partial meniscectomy caused a further posterior shift in location of peak contact pressure.

**Conclusions:** Medial meniscal radial tears up to 60% of the rim width do not affect the size or location of peak contact pressure along the medial tibial plateau. Partial meniscectomy leads to higher contact pressures and a change in location of peak contact pressure. This study suggests that "large radial meniscal tears are not functionally equivalent to partial meniscectomies" and that meniscal preservation either via meniscal repair or benign neglect are biomechanically favorable to partial meniscectomy.

**Reviewer’s Comments:** Although this is a biomechanical, cadaveric study with time-zero data only, this study provides useful information for arthroscopists who encounter asymptomatic radial tears as incidental findings. (Reviewer-Adam J. Farber, MD).

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Keywords: Medial Meniscus Radial Tear, Meniscal Repair, Partial Meniscectomy, Contact Pressure

Print Tag: Refer to original journal article
In this Bankart repair model, knotless suture anchor repair is associated with a lower ultimate load to failure with cyclic testing compared to 3 different repair techniques performed using arthroscopic knot-tying techniques.

**Background:** Traditional arthroscopic Bankart repairs have been performed with suture anchors and standard knot tying techniques, but recently some surgeons have begun to use knotless suture anchors.

**Objective:** To determine biomechanical properties of arthroscopic Bankart repair performed using a variety of repair techniques. Techniques included use of a single-loaded suture anchor and simple stitches, use of a single-loaded suture with a horizontal mattress stitch, use of a double-loaded suture anchor with simple stitches, and use of knotless suture anchors.

**Design:** Cadaveric biomechanical laboratory study.

**Methods:** The study was divided into 2 phases. In phase 1, load to failure testing was performed and in phase 2, cyclical loading testing was performed. Fresh frozen human cadaveric shoulders with no obvious degenerative or labral pathology were included in the study. In all specimens, a Bankart tear was created sharply. In phase 1, 10 specimens (mean age 55 years; range 48 to 63 years) were randomized to either repair using single sutures with simple stitch configuration or knotless suture anchors. Specimens were then loaded to failure using a materials testing machine. In phase 2, 20 specimens (mean age 64 years; range 45 to 91 years) were randomized to be repaired by 1 of 4 techniques: single-loaded suture anchor and simple stitch configuration, single-loaded suture anchor and horizontal mattress stitch configuration, double-loaded suture anchor and simple stitch configuration, or knotless suture anchor repair. Using a materials testing machine, specimens were loaded cyclically for 100 cycles from 5 to 25 N at 1 Hz followed by load to failure testing.

**Results:** In phase 1, there was no difference in ultimate load to failure, stiffness, or mode of failure between the 2 groups ($P > 0.05$). The knotless repair group, however, reached 2 mm of displacement with significantly less load than the standard suture anchor repair group (35.0 N vs 66.5 N; $P < 0.05$). In phase 2, the knotless repair group had a significantly lower ultimate load to failure than the other 3 repair groups ($P < 0.05$). There was no difference between any of the 4 groups in terms of stiffness, load at 2 mm of displacement, and gapping ($P > 0.05$).

**Conclusions:** When cyclic testing was performed in this Bankart repair model, there was no difference in biomechanical properties of repairs performed with single-loaded suture anchors with either simple or horizontal mattress stitches or double-loaded suture anchors, but knotless anchor repairs had a significantly lower ultimate load to failure.

**Reviewer's Comments:** The study is limited by the fact that it is a biomechanical, cadaveric study with time-zero data only. Additional in vivo studies are needed to determine the influence of suture repair construct on healing potential and clinical results. (Reviewer-Adam J. Farber, MD.)

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Keywords: Plication, Glenohumeral Joint, Bankart, Knotless Suture Anchor

Print Tag: Refer to original journal article
When performing a posteroinferior capsular plication of the shoulder, there are no biomechanical differences between using a simple stitch, a horizontal mattress stitch, or a figure-of-eight stitch to perform the plication.

**Background:** Although plications of the posteroinferior capsule of the glenohumeral joint have been used to treat posterior shoulder instability as well as to augment anterior shoulder stabilizations, the optimal plication technique is unknown.

**Objective:** To assess the biomechanical properties of different suture plication techniques of the posteroinferior capsule.

**Design:** Biomechanical cadaveric laboratory study.

**Methods:** 21 fresh-frozen human cadaveric shoulders (14 males and 7 females; mean age, 57.7 years [range, 33 to 92 years]) were utilized in this study. No specimen had evidence of labral pathology or degenerative changes. Specimens were not stretched to recreate posterior capsular laxity and no reverse Bankart repair was created. Specimens were randomized to undergo posteroinferior capsular plication by 1 of 3 different techniques: in group 1 (n=7), plication was performed with a free suture and a simple stitch. In group 2 (n=7), plication was performed with a free suture and a horizontal mattress stitch and in group 3 (n=7), plication was performed with a free suture and a figure-of-eight stitch. All specimens were loaded onto a materials testing machine and loaded for 100 cycles from 5N to 25 N at 1 Hz, followed by load to failure testing at 15 mm/minute.

**Results:** There was no significant difference in the ultimate load to failure, the load required to reach 2 mm of displacement, and gapping between any of the 3 stitch configurations ($P >0.05$). However, the modes of failure differed significantly among the 3 groups ($P <0.0001$). In group 1, failure occurred by capsular rupture in 57% of specimens and by tearing at the glenolabral junction in 43%. In group 2, failure occurred at the glenolabral junction in 86% versus capsular rupture in 14%. In group 3, failure occurred at the glenolabral junction in 71% versus capsular rupture in 29%.

**Conclusions:** When performing a posteroinferior capsular plication of the shoulder, there are no biomechanical differences between using a simple stitch, a horizontal mattress stitch, or a figure-of-eight stitch to perform the plication. Given this information, the authors recommend that the simple stitch configuration be used because of its simplicity and technical ease. The authors speculate that the multiple perforations of the capsule required to perform the mattress and figure-of-eight stitches may place the capsule at risk for rupture and thus account for the differences in modes of failure between the 3 plication constructs.

**Reviewer's Comments:** This study is limited by the fact that it is a cadaveric, biomechanical study with time-zero data and no assessment of healing potential. It is certainly possible that the more complex stitch configurations provide a greater surface area for capsular healing and thus lead to improved clinical outcomes. Clinical studies are needed to compare the different posteroinferior capsular plication techniques. (Reviewer-Adam J. Farber, MD).

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**Keywords:** Plication, Glenohumeral Joint, Posteroinferior, Suture Anchor

**Print Tag:** Refer to original journal article
When performing primary total shoulder arthroplasty, a lesser tuberosity osteotomy is associated with higher postoperative clinical outcome scores when compared to a subscapularis tenotomy.

**Background:** No studies have been performed that compare the use of a subscapularis tenotomy versus a lesser tuberosity osteotomy for exposure during total shoulder arthroplasty.

**Objective:** To compare the clinical and radiographic outcomes of primary total shoulder arthroplasty performed by one surgeon utilizing either a subscapularis tenotomy or a lesser tuberosity osteotomy.

**Design:** Retrospective case series.

**Participants/Methods:** 35 consecutive shoulders in 34 patients who underwent primary total shoulder arthroplasty by one surgeon from 2004 to 2006 were included in this study. In 2005, the author began performing a lesser tuberosity osteotomy in all patients. Prior to that time, a subscapularis tenotomy was performed. Therefore there were 2 distinct groups of patients: group 1 included 15 shoulders in 14 patients (7 male and 7 female; mean age, 67 years [range, 50 to 80 years]) who underwent subscapularis tenotomy; group 2 included 20 shoulders in 20 patients (14 male and 6 female; mean age, 69 years [range, 50 to 83 years]) who underwent a lesser tuberosity osteotomy. All patients received the same prosthesis and underwent the same standardized postoperative regimen. Outcome measures included subjective clinical outcomes measured by the validated Penn Shoulder Score, x-rays, ultrasound examination to assess integrity of the subscapularis, internal rotation strength as measured by a dynamometer, and range of motion.

**Results:** Mean final follow-up was 33 months (minimum, 12 months). Compared to preoperative values, patients in both group 1 and group 2 had significant improvements in the Penn Shoulder Score after surgery ($P <0.00001$ for both). Patients in group 2, however, had significantly higher postoperative Penn Shoulder Scores (92 vs 81; $P =0.04$). On ultrasound examination, 2 patients in group 2 had an abnormality of the subscapularis tendon versus 7 shoulders in group 1 ($P =0.01$). At 1 year, patients with abnormalities of the subscapularis on ultrasound had significantly lower Penn Shoulder Scores than those with normal ultrasound studies ($P =0.01$), but by 2 years this difference was not significant ($P =0.25$). All osteotomies of the lesser tuberosity healed on radiographic evaluation. There was no significant difference between the 2 groups with regard to postoperative passive external rotation ($P =0.19$). When controlling for gender differences, there was no significant difference in internal rotation strength between the 2 groups. **Conclusions:** When performing primary total shoulder arthroplasty, a lesser tuberosity osteotomy is associated with a lower rate of subscapularis abnormality on ultrasound. There is no difference between the 2 techniques in terms of range of motion or internal rotation strength.

**Reviewer's Comments:** This study is limited by the small number of patients included, the gender differences between groups, and the retrospective nature of the study. (Reviewer-Adam J. Farber, MD).

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Keywords: Total Shoulder Arthroplasty, Subscapularis Tenotomy, Lesser Tuberosity, Outcomes

Print Tag: Refer to original journal article
SLAP Lesions Can Be Treated Nonoperatively in Some Patients

Nonoperative Treatment of Superior Labrum Anterior Posterior Tears: Improvements in Pain, Function, and Quality of Life.

Edwards SL, Lee JA, et al:


Up to 50% of patients with superior labral tears can be treated successfully nonoperatively with a program consisting of anti-inflammatory medications and physical therapy.

Background: Few studies have evaluated the role for nonoperative treatment of superior labrum anterior posterior (SLAP) lesions.

Design: Case series.

Participants/Methods: Questionnaires were sent to 371 patients who were treated for SLAP tears at one institution between 2000 and 2005 before and after treatment. Questionnaires included a variety of validated outcomes measures including: Short Form 36 (SF-36), European Quality of Life measure (EuroQol), visual analog pain scale (VAS), American Shoulder and Elbow Surgeons (ASES) score, and simple shoulder test (SST) score. All patients had isolated SLAP lesions diagnosed by clinical examination and MRI or MR arthrography. All patients underwent a course of physical therapy including anti-inflammatory medications and a physical therapy program with an emphasis on scapular stabilization exercises and posterior capsular stretching. Of the 371 questionnaires, only 50 were completed and returned. Eleven patients were excluded for a variety of reasons. The remaining 39 patients were included in the study. Of the 39 patients, 19 (49%; 14 men and 5 women; mean age, 34 years) were successfully treated by nonoperative measures; the remaining 20 patients failed nonoperative treatment and required surgery.

Results: Mean final follow-up was 3.1 years (range, 1 to 6 years). In those 19 patients treated nonoperatively, there was significant improvements in the ASES score (58.5 to 84.7; \( P = 0.001 \)) and SST score (8.3 to 11.0; \( P = 0.02 \)). In addition, the VAS pain scores decreased significantly (4.5 to 2.1; \( P = 0.043 \)) and the EuroQol scores increased significantly (0.75 to 0.89; \( P = 0.009 \)) with nonoperative treatment. Although all athletes that were successfully treated nonoperatively were able to return to their sport, only 66.7% of the overhead athletes returned at a level equal to or better than their preinjury status.

Conclusions: This study suggests that approximately 50% of patients with superior labral tears can be treated successfully nonoperatively with a program consisting of anti-inflammatory medications and physical therapy (with an emphasis on posterior capsular stretching and periscapular strengthening). Overhead athletes may be less likely to regain their preinjury functional level.

Reviewer's Comments: This study is limited by the extremely low response rate; only 50 of 371 eligible patients completed questionnaires. In addition, the study is dependent upon physical examination and imaging studies for diagnosing SLAP tears, but these methods are not 100% accurate. Despite these limitations, the study suggests that there is a definite role for nonoperative treatment of isolated SLAP tears. Future studies are required to more accurately determine the expected success rate of such treatment and to define patient or injury factors that may predict success or failure of nonoperative treatment. (Reviewer-Adam J. Farber, MD).

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Keywords: Superior Labrum Anterior Posterior Lesions, Outcomes, Quality of Life

Print Tag: Refer to original journal article
PLC, LCL Reconstruction -- A Novel Technique With Good Outcomes

Anatomic Reconstruction of the Posterolateral Corner of the Knee: A Case Series With Isolated Reconstructions in 27 Patients.

Jakobsen BW, Lund B, et al:

Arthroscopy 2010; 26 (July): 918-925

Reconstruction of the lateral collateral ligament and posterolateral corner using 2 autograft hamstring tendons can restore varus and external rotational stability in 95% of patients.

Background: The lateral collateral and posterolateral corner ligamentous complex includes numerous structures that are rarely injured in isolation. There have been no clinical studies reporting the clinical outcomes of isolated posterolateral corner (PLC) injuries treated with combined lateral collateral ligament (LCL) and posterolateral corner reconstructions.

Objective: To present the clinical results of a series of patients who underwent isolated reconstruction of the PLC with a novel technique. This technique utilizes 2 autologous hamstring tendons to reconstruct the LCL, popliteus tendon, and popliteofibular ligament.

Design: Retrospective case series.

Participants/Methods: 40 patients with isolated injuries to the LCL and PLC underwent ligamentous reconstruction between 1997 and 2005. Twenty-seven (11 females and 16 males; median age, 28 years [range, 13 to 57 years]) of these 40 patients were available for follow-up more than 2 years postoperatively and comprised the study group. Diagnosis was made on the basis of clinical examination, which included both varus and external rotational instability. All patients were treated with an open reconstruction that used semitendinosus and gracilis autograft tendons. One graft was used to reconstruct the LCL in a sling-type fashion by passing through the fibular tunnel and into a femoral tunnel. The other graft was used to reconstruct both the popliteus tendon and popliteofibular ligament by passing from a second femoral tunnel through a tibial tunnel and then the fibular tunnel. All patients followed a standardized postoperative rehabilitation protocol. Outcome measures included International Knee Documentation Committee (IKDC) objective scores, subjective Knee Injury and Osteoarthritis Outcome Scores (KOOS), Tegner activity levels, and range of motion.

Results: Median final follow-up was 46 months (range, 24 to 86 months). Overall, 5% of patients had an abnormal external rotation dial test postoperatively versus 60% preoperatively \( (P < 0.05) \). In total, 71% of patients had a normal IKDC objective score postoperatively as compared to 40% preoperatively \( (P < 0.05) \). Four patients suffered from flexion deficits; in 2 patients there was a 5° deficit and in 2 patients there was a 10° deficit. The KOOS profile was similar to patients who had undergone partial meniscectomy in other studies. The Tegner score at final follow-up was 4.6. Complications included one deep infection but no peroneal nerve injuries.

Conclusions: This study describes a novel technique for reconstruction of the posterolateral corner and lateral collateral ligamentous complexes using autograft hamstring tendons. This study showed good subjective and objective outcome scores following this technique.

Reviewer's Comments: This study is limited by its retrospective, non-controlled nature. Future controlled trials comparing this technique to other previously described techniques would be useful. In addition, biomechanical studies comparing this technique to simpler techniques may also be useful. (Reviewer-Adam J. Farber, MD).

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Keywords: Posterolateral Corner Isolated Reconstruction, Outcomes

Print Tag: Refer to original journal article