

Posterior Shoulder Instability, Part I—Diagnosis, Nonoperative Management, and Labral Repair for Posterior Shoulder Instability—An International Expert Delphi Consensus Statement



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Purpose: To establish consensus statements on the diagnosis, nonoperative management, and labral repair for posterior shoulder instability. **Methods:** A consensus process on the treatment of posterior shoulder instability was conducted, with 71 shoulder/sports surgeons from 12 countries participating on the basis of their level of expertise in the field. Experts were assigned to 1 of 6 working groups defined by specific subtopics within posterior shoulder instability. Consensus was defined as achieving 80% to 89% agreement, whereas strong consensus was defined as 90% to 99% agreement, and unanimous consensus was indicated by 100% agreement with a proposed statement. **Results:** Unanimous agreement was reached on the indications for nonoperative management and labral repair, which include whether patients had primary or recurrent instability, with symptoms/functional limitations, and whether there was other underlying pathology, or patient's preference to avoid or delay surgery. In addition, there was unanimous agreement that recurrence rates can be diminished by attention to detail, appropriate indication and assessment of risk factors, recognition of abnormalities in glenohumeral morphology, careful capsulolabral debridement and reattachment, small anchors with inferior placement and multiple fixation points that create a bumper with the labrum, treatment of concomitant pathologies, and a well-defined rehabilitation protocol with strict postoperative immobilization. **Conclusions:** The study group achieved strong or unanimous consensus on 63% of statements related to the diagnosis, nonoperative treatment, and labrum repair for posterior shoulder instability. The statements that achieved unanimous consensus were the relative indications for nonoperative management, and the relative indications for labral repair, as well as the steps to minimize complications for labral repair. There was no consensus on whether an arthrogram is needed when performing advanced imaging, the role of corticosteroids/orthobiologics in nonoperative management, whether a posteroinferior portal is required. **Level of Evidence:** Level V, expert opinion.

See commentary on page 196

Posterior shoulder instability comprises approximately 2% to 10% of all glenohumeral instability cases and occurs in a wide range of patient populations.¹⁻⁵ However, it is less understood than anterior

shoulder instability and, as a result, many aspects of the management of this pathology remain controversial because of a relative lack of high-level evidence on this topic. In addition, unlike anterior instability, it is less

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likely to present with a frank dislocation, and it may present with pain.⁶ Posterior instability is also more of a spectrum of pathologies, occurring as a result of acute traumatic dislocations, repetitive microtrauma resulting in instability, and atraumatic cases.

A comprehensive clinical assessment is essential for diagnosing posterior shoulder instability, with the aim to identify the root cause and assess the likelihood of recurrence in the patient.⁷⁻⁹ Although numerous factors can be gathered from the patient's history and physical examination, the literature provides limited guidance on which ones hold the greatest relevance in specific clinical scenarios.¹⁰ Furthermore, there remains a lack of consensus regarding the criteria for surgical intervention, including traumatic/atraumatic, and cases of repetitive microtrauma.¹¹⁻¹⁴ When surgery is chosen, the typical approach involves an arthroscopic labral repair. Nevertheless, other surgical treatment methods are available, yet there is no universally accepted set of criteria for their application.

Several previous societies have developed both national and international consensus statements on a variety of topics.¹⁵⁻²² Previous consensus statements have been developed for anterior shoulder instability through the Neer Circle group of the American Shoulder and Elbow Surgeons and the Anterior Shoulder Instability International Consensus Group.^{15,23-25} The purpose of this study was to establish consensus statements on the diagnosis, nonoperative management, and labral repair for posterior shoulder instability. Our hypothesis was that there would be consensus on most statements regarding the diagnosis, nonoperative management, and labral repair for posterior shoulder instability.

Methods

Consensus Working Groups

Seventy-one shoulder/sports surgeons from 12 countries on 4 continents participated in these consensus statements on posterior shoulder instability, with 74 initially being invited and 3 declining. The working groups were established by the steering committee (E.H., J.L., L.J., G.G., S.N., J.H., B.M., P.C., B.W., B.E., C.K., O.A., J.D.). These authors contributed to the creation and recommended people to be involved in the process. Furthermore, recent conferences of the Arthroscopy Association of North America, American Orthopaedic Society for Sports Medicine, American Shoulder and Elbow Surgeons, European Society for Surgery of the Shoulder and Elbow, European Society of Sports Traumatology, Knee Surgery, and Arthroscopy, and the International Congress of Shoulder and Elbow Surgery were screened for who were the invited speakers on the topic/presenting research on the topic to ensure that the thought leaders in the area were invited. We sought to include surgeons from multiple

countries so that different philosophies and viewpoints were included for a true international consensus. Experts were assigned to 1 of 6 working groups defined by specific subtopics of interest within posterior shoulder instability, including (1) diagnosis, (2) nonoperative management, (3) labrum repair, (4) glenoid bone grafts, (5) glenoid osteotomy, and (6) rehabilitation, return to play, and follow-up. This study represents the first 3 of the working groups topics, and a second companion article²⁶ focuses on the final 3. Working groups were kept geographically balanced to limit bias and ensure the groups were representative of the field at large. Thus, each working group was assigned surgeons from at least 2 different countries involved in an effort to minimize regional bias. The working groups and members are shown in [Appendix Table 1](#), available at www.arthroscopyjournal.org. Furthermore, the participants were instructed to answer the questionnaires on the basis of the best-available evidence rather than personal preference. A liaison (E.T.H.) served as the primary point of contact and facilitated communication and the distribution of surveys to ensure consistency across the working groups. In addition, the liaison formulated each subsequent round of questionnaires based on the previous round's responses. To reduce the potential for bias in the data analysis and/or literature review, the liaison did not submit answers to the questionnaires or partake in the voting process.

Consensus Method

Six working groups covering the principal topics of interest in posterior shoulder instability were established. A set of questions pertaining to each working group was generated based on clinical relevance and areas of controversy identified through systematic review of the literature and by the nine experts on the steering committee. A modification of the Delphi method was used to generate consensus statements for each working group, with groups completing 3 initial rounds of questionnaires, followed by amendments, and lastly a final vote.^{23-25,27} Surveys were distributed in a blinded fashion using REDCap (Vanderbilt University, Nashville, TN). All of the questionnaire responses and votes were anonymized. Questions progressed from an open-ended to a more structured format and were designed to elucidate areas of agreement and disagreement between group members. Once a preliminary consensus statement was generated within a working group, participants were asked whether they "agreed" or "disagreed" with it. The questions were subject to further suggested changes anonymously through the REDCap software by members of the entire consensus group, with statements being amended where there was agreement with the proposed change. The final voting process allowed all study participants to assess the consensus statements

Table 1. Diagnosis

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: How should posterior shoulder instability be classified? A: Posterior shoulder instability should be classified by the ABC classification: A (1, subluxation; 2, dislocation), B (1, functional; 2, structural), C (1, constitutional; 2, acquired).	0%	5%	15%	44%	36%	Consensus (80%)
Q: Which aspect(s) of the patient history should be documented in the setting of suspected/known posterior shoulder instability? A: The aspects of the patient history that should be documented in the setting of suspected/known posterior shoulder instability are (1) age/age at first instability event, (2) sex, (3) number of dislocations/subluxations, (4) original mechanism of injury/most recent mechanism of injury, (5) voluntary dislocator, (6) pain, (7) instability symptoms, (8) occupation, (9) sport played, position, and level, (10) hand dominance, (11) instability with low energy, i.e., sleep, (12) history of seizures, (13) previous treatment(s), and (14) other injury/medical and surgical history.	2%	0%	0%	18%	80%	Strong Consensus (98%)
Q: Which aspect(s) of the physical examination should be performed/ documented in the setting of suspected/ known posterior shoulder instability? A: The aspects of the patient examination that should be performed/documentated in the setting of suspected/known posterior shoulder instability are (1) findings on inspection, (2) sulcus sign, (3) range of motion, (4) neurologic examination, (5) anterior/posterior apprehension, (6) load and shift, (7) flexion and internal rotation apprehension/relocation, (8) jerk test, (9) Beighton score, (10) Gagey test, (11) Kim test, (12) O'Brien test, scapular motion, and (13) rotator cuff/shoulder strength testing.	0%	0%	1%	29%	70%	Strong Consensus (99%)
Q: In the acute setting, are radiographs required before attempting reduction of a dislocated shoulder? Are postreduction images required? A: In the acute clinical setting, radiographs are required both before attempting reduction of a dislocated shoulder and postreduction. On the athletic field, it is acceptable for an orthopaedic surgeon to attempt a gentle closed reduction without radiographs, and postreduction imaging is required.	0%	1%	3%	20%	76%	Strong Consensus (96%)
Q: Which plain radiographic views should be obtained to evaluate suspected/known posterior shoulder instability? A: The plain radiographic views that should be obtained are (1) AP, (2) axillary/Velpeau, (3) Grashey, and (4) Scapular-Y.	0%	3%	5%	27%	65%	Strong Consensus (92%)

(continued)

Table 1. Continued

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: When should advanced imaging (MRI/CT) be performed in a patient presenting with suspected/known posterior shoulder instability? A: Advanced imaging should be performed if (1) considering surgery, (2) fails conservative management, and/or (3) chronic pain >3 months after the instability event.	0%	1%	0%	26%	73%	Strong Consensus (99%)
Q: Which advanced imaging modality is preferred for a patient presenting with suspected/known posterior shoulder instability, CT or MRI? A: An MRI should be performed first line. A CT should be performed if bone loss is suspected and it may influence treatment.	0%	1%	3%	17%	79%	Strong Consensus (96%)
Q: If a CT or MRI is being performed, does it require an arthrogram? A: If a CT or MRI is being performed it does not routinely require an arthrogram.	7%	11%	14%	23%	45%	No Consensus (68%)

AP, anteroposterior; CT, computed tomography; MRI, magnetic resonance imaging.

generated by the other working groups and vote on whether they “strongly agreed,” “agreed,” were “neutral,” “disagreed,” or “strongly disagreed” with them; thus, all statements were voted on by all 71 participants.

Final Voting

After the final votes for each question occurred, the degree of agreement was expressed using a percentage rounded to the nearest whole number. Consensus was defined as 80% to 89%, whereas strong consensus was defined as 90% to 99%, and unanimous consensus was indicated by receiving 100% of the votes in favor of a proposed statement.^{23-25,27} This consensus study was conducted in accordance with best practice for Delphi process.^{28,29} Descriptive statistics were calculated using Excel (2023; Microsoft Corp., Redmond, WA).

Results

Diagnosis

Of the 8 total questions and consensus statements in this group, none achieved unanimous consensus, 6 achieved strong consensus, 1 achieved consensus, and 1 did not achieve any level of consensus. The statement that did not achieve consensus was that if a computed tomography (CT) or magnetic resonance imaging (MRI) is being performed, it does not routinely require an arthrogram, which achieved 68% consensus. All of these statements are shown in [Table 1](#), and the initial questions from Rounds 1-3 are included in [Appendix Table 2](#), available at www.arthroscopyjournal.org.

Nonoperative Management

Of the 8 total questions and consensus statements in this group, 1 achieved unanimous consensus, 5 achieved strong consensus, 1 achieved consensus, and 1 did not achieve consensus. The statement achieving unanimous consensus was that the relative indications for nonoperative management are (a) first-time dislocator, (b) uncontrolled seizure disorder, (c) ligamentous laxity/connective tissue disorder, (d) subluxations without dislocation, (e) dynamic functional instability, (f) timing in-season to allow for return to play, (g) patient preference to avoid surgery, and (h) low functional demand. In addition, the statement that did not achieve consensus was that there is no role for corticosteroids or orthobiologics in the nonoperative management of posterior shoulder instability, which achieved 74% consensus. All of these statements are shown in [Table 2](#), and the initial questions from Rounds 1-3 are included in [Appendix Table 3](#), available at www.arthroscopyjournal.org.

Labral Repair

Of the 16 total questions and consensus statements in this group, 2 achieved unanimous consensus, 6 achieved strong consensus, 7 achieved consensus, and 1 did not achieve consensus. The statements achieving unanimous consensus were as follows: relative indications for labral repair are (1) symptomatic instability, (2) recurrent dislocations, (3) pain, (4) symptomatic labral tear (i.e., pain/instability symptoms), (5) functional limitations, (6) positive physical examination findings, and (7) failed physical therapy.

Table 2. Nonoperative Management

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: What are the indications for an initial trial of nonoperative management?	0%	0%	0%	33%	67%	Unanimous (100%)
A: The relative indications for nonoperative management are (1) first-time dislocator, (2) uncontrolled seizure disorder, (3) ligamentous laxity/connective tissue disorder, (4) subluxations without dislocation, (5) dynamic functional instability, (6) timing in-season to allow for return to play, (7) patient preference to avoid surgery, and (8) low functional demand.						
Q: What are the contraindications for nonoperative management?	0%	0%	5%	56%	39%	Strong Consensus (95%)
A: The relative contraindications for nonoperative management are (1) recurrent dislocators, (2) failed closed reduction, (3) severe glenoid bone loss, (4) collision athletes, (5) batter's shoulder, (6) gamma angle >90° and/or posterior decentring, (7) dynamic instability with relevant structural defects.						
Q: If a patient is undergoing nonoperative management, for how long should it be trialed before undergoing operative fixation?	0%	0%	5%	45%	50%	Strong Consensus (95%)
A: If a patient is undergoing nonoperative management, a minimum of 6 to 8 weeks should be trialed before undergoing operative fixation unless there is a further dislocation.						
Q: Does immobilization play a role in the nonoperative management of posterior shoulder instability? If so, for what duration of time? What arm position? Should an abduction pillow be used?	0%	3%	9%	58%	30%	Consensus (88%)
A: Yes, immobilization plays a role and patients should be immobilized for 2 to 3 weeks in neutral rotation. There is no established benefit to an abduction pillow.						
Q: When should patients start shoulder range-of-motion exercises?	0%	3%	6%	42%	49%	Strong Consensus (91%)
A: After a traumatic instability event, patients should start shoulder range-of-motion exercises after 1 to 2 weeks once comfort permits.						
Q: When should patients start resistance training exercises?	0%	0%	2%	36%	62%	Strong Consensus (98%)
A: After a traumatic instability event, patients should start resistance training exercises once full range of motion is restored and patients can perform the exercises without apprehension.						
Q: When should patients start sport-specific training exercises?	0%	0%	2%	33%	65%	Strong Consensus (98%)
A: After a traumatic instability event, patient should start sport-specific training exercises once full range of motion and strength are restored, dependent on the timing in the season.						

(continued)

Table 2. Continued

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: Do corticosteroids/orthobiologics play a role in nonoperative management?	0%	6%	20%	23%	51%	No Consensus (74%)
A: There is no role for corticosteroids or orthobiologics in the nonoperative management of posterior shoulder instability.						

Complications, other than recurrence, are rare after a labral repair procedure. However, steps that may reduce complications include (1) attention to detail, (2) appropriate indication and assessment of risk factors, (3) recognition of abnormalities in glenohumeral morphology (i.e., bone loss, version), (4) careful capsulolabral debridement and reattachment, (5) inferior anchor placement, (6) multiple anchor fixation points, (7) small anchors to minimize postage-stamp fracture, (8) creating a bumper with the labrum, (9) treat concomitant pathologies, (10) well-defined rehabilitation protocol, and (11) strict postoperative immobilization. The statement that did not achieve consensus was that a posteroinferior portal is necessary, which achieved 66% consensus. All of these statements are shown in [Table 3](#), and the initial questions from Rounds 1-3 are included in [Appendix Table 4](#), available at www.arthroscopyjournal.org.

Discussion

The most important finding from this study was that most of the statements reached consensus, with 3 of the included statements reaching unanimous agreement. The statements that achieved unanimous consensus were the relative indications for nonoperative management, the relative indications for labral repair, as well as the steps to minimize complications for labral repair. There was no consensus on whether an arthrogram is needed when performing advanced imaging, the role of corticosteroids/orthobiologics in nonoperative management, or whether a posteroinferior portal is required. These consensus statements represent our group's expert agreement on diagnosis, nonoperative management, and labral repair for posterior shoulder instability. As with previous consensus statements; these studies represent Level V data as expert opinion, and our hope is that it will serve as a catalyst to address the gaps in the evidence where they exist while providing guidance based on the current evidence.

There was strong consensus among this working group for most statements pertaining to the diagnostic workup for patients with suspected posterior shoulder instability. Posterior shoulder instability can present with vague symptoms without a history of trauma or instability event, making the diagnosis of these injuries

difficult. In contrast to patients with anterior shoulder instability, Bernhardson et al.⁶ showed that the majority of patients with posterior shoulder instability report pain or mechanical symptoms as opposed to subjective instability that may often result from repetitive microtrauma, generalized ligamentous laxity, or anatomic predisposition. Therefore, patient history with thorough investigation of the etiology of symptoms, risk factors, and patient demand should be well documented and correlated with physical examination findings to better delineate the underlying pathophysiology, as it may help predict which patients may benefit from conservative or surgical management.^{8,9,30} Consensus regarding the use of the ABC classification for posterior shoulder instability to help guide treatment is further supported by this concept, although further studies should be performed to prove its reliability and applicability.⁸ The ABC classification is used to describe posterior instability and suggest treatment options on the basis of clinical and imaging findings (A [1, subluxation or 2, dislocation], B [1, functional or 2, structural], and C [1, constitutional or 2, acquired]). There was a consensus that this system should be adopted, although further studies should be performed to prove its reliability and applicability.⁸

Four of 5 statements regarding diagnostic imaging reached strong consensus. It was strongly agreed on that a plain radiograph shoulder series should be obtained in suspected posterior instability, as well as before and after reduction of a dislocated shoulder. However, there was also strong consensus that a gentle attempt to reduce a dislocated shoulder on the athletic field may be performed with required postreduction imaging. The use of MRI was further strongly agreed on as a first-line advanced imaging modality and should be obtained when considering surgery, failed conservative management, or for patients with chronic pain >3 months after the instability event, and that CT imaging should be reserved for suspected glenoid bone loss, which may influence treatment and often be present in the setting of trauma or recurrent instability.⁹ This recommendation is most likely the result of the lack of evidence regarding the equivalency of MRI in quantifying posterior glenoid bone loss when compared to CT.³¹ Although there was no consensus regarding the requirement for obtaining arthrograms with CT or MRI,

previous literature demonstrates that both CT and MRI arthrograms have a high sensitivity and specificity for detecting posterior labral tears.^{32,33}

In this study, there was unanimous consensus for the indications for both nonoperative management and labral repair. These indications are heavily dependent on symptom characterization, previous treatments, functionality, and number of instability events. Although there is unanimous agreement that first-time dislocators should be treated nonoperatively, studies have reported that high-level athletes and military personnel presenting after discrete posterior instability event may have posterior bone loss, with up to 50% to 70% rate of nonoperative treatment failure.^{34,35} Furthermore, patients who experience recurrent instability may have worsening posterior glenoid bone loss, which has been shown to lead to greater reoperation rates compared with subsequent capsulolabral repair alone.³⁶ However, patients with atraumatic posterior shoulder instability have been demonstrated to have a low incidence of recurrent instability or progression to osteoarthritis when treated nonoperatively.¹² Studies have demonstrated that glenoid and acromial morphology may contribute to the success of nonoperative treatment.³⁷⁻³⁹ Therefore, patients treated nonoperatively should be appropriately counseled and followed for recurrence. It was agreed that a nonoperative treatment trial should consist of 2 to 3 weeks of neutral immobilization, followed by rehabilitation exercises emphasizing restoration of shoulder range of motion and strength for at least 6 to 8 weeks before undergoing operative fixation. The only statement not reaching consensus for nonoperative management was regarding the role of orthobiologics or corticosteroids, with a lack of literature on the topic which may warrant further investigation.

There was unanimous consensus that patients with persistent pain, symptomatic instability and recurrent dislocations, and continued functional limitation after physical therapy are indicated for posterior labral repair. Most patients undergoing posterior capsulolabral repair have demonstrated successful outcomes, with previous studies demonstrating a 92% return-to-sport rate and 88% to 97% stability rate after 3 years.⁴⁰ However, patients who are active military and athletes have been shown to have a 15% to 17.5% rate of persistent pain after shoulder stabilization, which may be attributed to glenoid morphology or bone loss, concomitant multidirectional instability or pathology, ligamentous laxity, or return to high-impact activities in these patient populations.⁴¹⁻⁴³ This supports the necessity of recognizing the indications for concomitant reverse remplissage, biceps tenodesis, or posterior capsule repair, of which all received strong consensus in this working group. The critical amount of posterior bone loss that warrants posterior bone block

augmentation remains to be debated, as Wolfe et al.³⁶ have shown a 44% rate of labral repair failure with >13.5% of posterior bone loss. In addition, Arner et al.² reported that posterior bone loss as low as 11% of glenoid surface area may result in a 10-fold greater failure rate. It is known that posterior labral tears can be found without clinical signs of posterior instability in the setting of repetitive microtrauma, hyperlaxity, and glenoid hypoplasia.⁴⁴⁻⁴⁷ This unanimous consensus supports the repair of posterior labral tears that meet other indications for surgery, even in the absence of instability.

Overall, labral repair techniques for posterior shoulder instability were generally agreed on. Unanimous consensus was reached for steps to minimize complications, all relating to an overall theme of attention to detail ranging from patient assessment and concomitant pathology recognition to necessary care taken to restore the capsulolabral junction with suture-anchor repair followed by a well-defined rehabilitation protocol. In general, there was consensus regarding positioning, anchor type, and placement, whereas there was no consensus for the necessity of a posteroinferior portal. In contrast to anterior shoulder instability, where there is strong consensus regarding anchor position and number because of its association with Bankart repair failure, these technical factors have not been demonstrated to be significantly associated with recurrence and failure in patients with posterior shoulder instability, which may explain the lack of strong or unanimous consensus among the related statements in this study.⁴⁸

Limitations

This study has several limitations. First, consensus statements are considered to be Level V data, as they represent expert opinion, which makes them susceptible to inherent biases in the selection and allocation of participants.^{19,49} Ultimately, it is somewhat subjective in how the experts were selected, but that is the case with any expert panel, and we tried to minimize this bias. Furthermore, the questions and topics addressed may represent a potential source of bias, as there was no standardized process for generating them. Instead, they were each selected and agreed on by the group leaders. In addition, these statements involved a modification of the Delphi process as the participants worked on their individual groups for the first 3 rounds and not all of the statements. Participants may not have agreed with each item in a given statement, which may influence the strength of agreement with each statement. Finally, there are some limitations with the Delphi process itself, as it may represent the lowest common denominator of expert opinion with less of ownership of ideas, and ultimately represents Level V data.⁴⁹ The lack of robust evidence available to inform expert opinion may be considered a limitation, as well

Table 3. Labral Repair

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: What are the indications for labral repair? A: The relative indications for labral repair are (1) symptomatic instability, (2) recurrent dislocations, (3) pain, (4) symptomatic labral tear (i.e., pain/instability symptoms), (5) functional limitations, (6) positive physical examination findings, and (7) failed physical therapy.	0%	0%	0%	30%	70%	Unanimous (100%)
Q: What are the contraindications for labral repair? A: The relative contraindications for labral repair are (1) severe glenoid bone loss, (2) moderate-to-severe osteoarthritis, (3) stiffness, (4) likelihood of poor compliance with postoperative rehabilitation, (5) uncontrolled epilepsy, (6) irreparable tear pattern, and (7) asymptomatic tear (i.e., no pain/instability symptoms).	0%	2%	1%	31%	66%	Strong Consensus (97%)
Q: Is there an amount of glenoid bone loss above which a labral repair should not be performed? A: There is no amount of glenoid bone loss above which a labral repair should not be performed; however, above 15% to 20% there should be consideration for a block-block procedure.	0%	3%	3%	41%	53%	Strong Consensus (94%)
Q: When should a capsular plication be performed over a labral repair? A: A capsular plication should never be performed over a labral repair, but it may be useful as an adjunct in those with ligamentous/capsular laxity.	2%	3%	8%	36%	51%	Consensus (87%)
Q: When should a posterior capsular repair be performed? A: A posterior capsular repair should routinely be performed when the capsule is torn/avulsed.	0%	2%	1%	27%	70%	Strong Consensus (97%)
Q: When should a posterior capsular reconstruction be performed? What graft should be used? A: A posterior capsular reconstruction is rarely indicated, but it may be in those with capsular defect and significant volume tissue loss. Either autograft or allograft can be used on the basis of availability and surgeon preference.	1%	0%	14%	44%	41%	Consensus (85%)
Q: What are the indications for performing concomitant reverse remplissage with a labral repair? A: The relative indications for reverse remplissage are (1) engaging reverse Hill-Sachs, (2) reverse Hill-Sachs with associated glenoid bone loss, and/or (3) revision labral repair with a reverse Hill-Sachs lesion.	0%	0%	6%	45%	49%	Strong Consensus (94%)

(continued)

Table 3. Continued

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: What are the indications for performing concomitant biceps tenodesis with a labral repair?	0%	0%	5%	33%	62%	Strong Consensus (95%)
A: The relative indications for performing concomitant biceps tenodesis with a labral repair are (1) concomitant superior labral tear extending into LHBT anchor, (2) concomitant LHBT tear/injury, and/or (3) concomitant LHBT instability.						
Q: Should labral repair be performed in the beach/captain's chair or lateral decubitus position, and why?	2%	0%	0%	24%	74%	Strong Consensus (98%)
A: Labral repair should be performed in the beach/captain's chair or lateral decubitus position based on surgeon preference.						
Q: What steps should be taken to minimize complications after a labral repair procedure?	0%	0%	0%	36%	64%	Unanimous (100%)
A: Complications, other than recurrence, are rare after a labral repair procedure. However, steps that may reduce complications include (1) attention to detail, (2) appropriate indication and assessment of risk factors, (3) Recognition of abnormalities in glenohumeral morphology (i.e., bone loss, version), (4) careful capsulolabral debridement and reattachment, (5) inferior anchor placement, (6) multiple anchor fixation points, (7) small anchors to minimize postage-stamp fracture, (8) creating a bumper with the labrum, (9) treat concomitant pathologies, (10) well-defined rehabilitation protocol, and (11) strict postoperative immobilization.						
Q: Is a posteroinferior portal necessary?	3%	5%	26%	27%	39%	No Consensus (66%)
A: Yes, a posteroinferior portal is necessary.						
Q: Should knotless or knotted anchors be used?	2%	1%	9%	29%	59%	Consensus (88%)
A: Knotless or knotted anchors can be used based on surgeon preference.						
Q: What is the optimal number of anchors when performing a posterior labral repair?	0%	5%	8%	33%	54%	Consensus (87%)
A: A minimum of 2 anchors should be used, but more should be used if required for the tear.						
Q: How far apart should anchors be placed when performing a labral repair?	0%	2%	15%	47%	36%	Consensus (83%)
A: Anchors should be placed approximately every 30° (each tick on the clock face) on the circumference of the glenoid.						

(continued)

Table 3. Continued

Questions and Answers	Strong Disagreement	Disagreement	Neutral	Agreement	Strong Agreement	Consensus
Q: Where should the lowest and highest anchor be placed when performing a labral repair in a right shoulder with regard to the clockface?	0%	5%	12%	39%	44%	Consensus (83%)
A: The lowest anchor should be placed between 6 and 6:30, and the highest anchor should be placed between 10 and 11.						

as the broad range of pathology which constitutes posterior instability.

Conclusions

The study group achieved strong or unanimous consensus on 63% of statements related to the diagnosis, nonoperative treatment, and labrum repair for posterior shoulder instability. The statements that achieved unanimous consensus were the relative indications for nonoperative management and the relative indications for labral repair, as well as the steps to minimize complications for labral repair. There was no consensus on whether an arthrogram is needed when performing advanced imaging, the role of corticosteroids/orthobiologics in nonoperative management, or whether a posteroinferior portal is required.

Disclosures

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Appendix

Appendix Table 1. Consensus Working Groups and Members

Group	Country of Practice
Diagnosis	
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Gregory P. Nicholson	U.S.A.
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Kendall E. Bradley	U.S.A.
Laith M. Jazrawi	U.S.A.
Leo Pauzenberger	Austria
Natalia Martinez-Catalan	Spain
Nicholas A. Trasolini	U.S.A.
Raffy Mirzayan	U.S.A.
Stephen A. Parada	U.S.A.
Travis A. Dekker	U.S.A.
Nonoperative management	
Alexandre Laedermann	France
Eiji Itoi	Japan
Grant E. Garrigues	U.S.A.
Jocelyn R. Wittstein	U.S.A.
John R. Wickman	U.S.A.
Jonathan F. Dickens	U.S.A.
Lance E. Leclere	U.S.A.
Mariano E. Menendez	U.S.A.
Maximiliano Ranalletta	Argentina
Michael J. O'Brien	U.S.A.
Philipp Moroder	Switzerland
Surena Namdari	U.S.A.
Labral repair	
Alison P. Toth	U.S.A.
Andreas B. Imhoff	Germany
Benjamin W. Hoyt	U.S.A.
Brandon J. Erickson	U.S.A.
Brett D. Owens	U.S.A.
Brian R. Waterman	U.S.A.
Christopher S. Klifto	U.S.A.
Dean C. Taylor	U.S.A.
Frank A. Cordasco	U.S.A.
Kelly G. Kilcoyne	U.S.A.
Luciano A. Rossi	Argentina
Peter J. Millett	U.S.A.
Bone block augmentation	
Bogdan A. Matache	Canada
George S. Athwal	Canada
Hannan Mullett	Ireland
Ivan Wong	Canada
Joaquin Sanchez-Sotelo	U.S.A.
Matthew T. Provencher	U.S.A.
Nata Parnes	U.S.A.
Oke A. Anakwenze	U.S.A.
Patrick J. Denard	U.S.A.
Rachel M. Frank	U.S.A.
Scott A. Rodeo	U.S.A.
Tally Lassiter	U.S.A.
Glenoid osteotomy	
Emilio Calvo	Spain
Greg Hoy	Australia
Lionel Neyton	France
Lukas Ernstbrunner	Australia

(continued)

Appendix Table 1. Continued

Group	Country of Practice
Philipp R. Heuberger	Austria
Ruth A. Delaney	Ireland
William N. Levine	U.S.A.
Xavier A. Duralde	U.S.A.
Yaw Boache-Adjei	U.S.A.
Rehabilitation and return to play	
Tristan Cassidy	Ireland
Brian C. Lau	U.S.A.
Christopher L. Camp	U.S.A.
Eric C. McCarty	U.S.A.
Eric R. Wagner	U.S.A.
John P. Scanaliato	U.S.A.
Julie Y. Bishop	U.S.A.
Michael T. Freehill	U.S.A.
Peter N. Chalmers	U.S.A.
Richard M. Danilkowicz	U.S.A.
Robert H. Brophy	U.S.A.
Salvatore J. Frangiamore	U.S.A.
Timothy B. Griffith	U.S.A.

Appendix Table 2. Group 1: Diagnosis

Round 1

- (1) Which aspect(s) of the patient history should be documented in the setting of suspected/known acute posterior shoulder instability?
- (2) Which aspect(s) of the patient history should be documented in the setting of suspected/known chronic posterior shoulder instability?
- (3) Which aspect(s) of the physical examination should be performed/documented in the setting of suspected/known posterior shoulder instability?
- (4) In the acute setting, are radiographs required before attempting reduction of a dislocated shoulder? Are postreduction images required?
- (5) Which plain radiographic views should be obtained to evaluate suspected/known posterior shoulder instability?
- (6) When should advanced imaging (MRI/CT) be performed in a patient presenting with suspected/known posterior shoulder instability?
- (7) Which advanced imaging modality is preferred for a patient presenting with suspected/known posterior shoulder instability, CT or MRI?
- (8) If a CT or MRI is being performed, does it require an arthrogram?

Round 2

Posterior shoulder instability should be defined by the Moroder classification: A (1, subluxation; 2, No dislocation), B (1, functional; 2, structural), C (1, constitutional; 2, acquired).

Do you agree with this statement? If not, why not?

Which aspect(s) of the patient history should be documented in the setting of suspected/known acute posterior shoulder instability?

- Age
- Acuity
- Gender
- Mechanism of injury/arm position
- Instability event (i.e., subluxation vs dislocation)
- Whether it required reduction
- Pain
- Occupation
- Sport played and position
- Level of sport
- Hand dominance
- Beighton score
- History of seizures
- Other injury/surgical history

Which aspect(s) of the patient history should be documented in the setting of suspected/known chronic posterior shoulder instability?

- Age
- Gender
- Age at first instability event
- Original mechanism of injury
- Instability with low energy (i.e., sleep)
- Number of dislocations/subluxations
- Most recent mechanism of injury
- Whether they require reduction/can self-reduce
- Voluntary dislocator
- Pain
- Instability symptoms
- Occupation, sport played, and position
- Level of sport
- Hand dominance
- Beighton score
- History of seizures
- Previous treatment(s)
- Other injury/surgical history

Which aspect(s) of the physical examination should be performed/documented in the setting of suspected/known posterior shoulder instability?

- Findings on inspection
- Neurologic examination
- Range of motion
- Rotator cuff/shoulder strength testing
- Anterior/posterior apprehension
- Load and shift
- Apprehension/relocation
- Jerk test
- Sulcus sign
- Beighton score
- Gages test

- Kims test
- Scapular motion

In the acute setting, radiographs are required both prior to attempting reduction of a dislocated shoulder and postreduction.

Do you agree with this statement? If not, why not?

Which plain radiographic views should be obtained to AP evaluate suspected/known posterior shoulder instability?

- Axillary
- Grashey
- Scapular-Y
- West Point view
- Stryker notch view

When should advanced imaging (MRI/CT) be performed in a patient presenting with suspected/known posterior shoulder instability?

- Routinely after first dislocation
- If fails conservative management
- If chronic pain >3 months after instability event
- If considering surgery

Which advanced imaging modality is preferred for a patient presenting with suspected/known posterior shoulder instability, CT or MRI?

- MRI first line and CT if bone loss suspected
- MRI only
- CT only
- Both MRI and CT always

If a CT or MRI is being performed, does it require an arthrogram?

- Yes – Acute
- Yes – Always
- No – If chronic
- NoRound 3

Q: How should posterior shoulder instability be classified?

A: Posterior shoulder instability should be classified by the Moroder classification: A (1, subluxation; 2, dislocation), B (1, functional; 2, structural), C (1, constitutional; 2, acquired).

Do you have any suggested changes?

Which aspect(s) of the patient history should be documented in the setting of suspected/known posterior shoulder instability?

A: The aspects of the patient history that should be documented in the setting of suspected/known posterior shoulder instability are

- (1) age/age at first instability event
- (2) gender
- (3) number of dislocations/subluxations
- (4) original mechanism of injury/most recent mechanism of injury
- (5) voluntary dislocator
- (6) pain
- (7) instability symptoms
- (8) occupation
- (9) sport played, position, and level
- (10) hand dominance
- (11) Beighton score
- (12) instability with low energy (i.e., sleep)
- (13) history of seizures
- (14) previous treatment(s)
- (15) other injury/medical and surgical history

Do you have any suggested changes?

Q: Which aspect(s) of the physical examination should be performed/documented in the setting of suspected/known posterior shoulder instability?

A: The aspects of the patient examination that should be performed/documented in the setting of suspected/known posterior shoulder instability are

- (1) rotator cuff/shoulder strength testing
- (2) range of motion
- (3) neurologic examination
- (4) anterior/posterior apprehension
- (5) load and shift
- (6) flexion and internal rotation apprehension/relocation
- (7) jerk test
- (8) sulcus sign
- (9) Beighton score
- (10) Gagey test
- (11) Kim test
- (12) scapular motion
- (13) findings on inspection

Do you have any suggested changes?

Q: In the acute setting, are radiographs required before attempting reduction of a dislocated shoulder? Are postreduction images required?

A: In the acute setting, radiographs are required both prior to attempting reduction of a dislocated shoulder and postreduction. Do you have any suggested changes?

Q: Which plain radiographic views should be obtained to evaluate suspected/known posterior shoulder instability?

A: The plain radiographic views that should be obtained are

- (1) AP
- (2) axillary
- (3) Grashey
- (4) Scapular-Y

Do you have any suggested changes?

Q: When should advanced imaging (MRI/CT) be performed in a patient presenting with suspected/known posterior shoulder instability?

A: Advanced imaging should be performed if

- (1) considering surgery,
- (2) fails conservative management, and/or
- (3) chronic pain >3 months after the instability event.

Do you have any suggested changes?

Q: Which advanced imaging modality is preferred for a patient presenting with suspected/known posterior shoulder instability, CT or MRI?

A: An MRI should be performed first line. A CT should be performed if bone loss is suspected and it may influence treatment.

Do you have any suggested changes?

Q: If a CT or MRI is being performed, does it require an arthrogram?

A: If a CT or MRI is being performed it does not routinely require an arthrogram.

Do you have any suggested changes?

AP, anteroposterior, CT, computed tomography; MRI, magnetic resonance imaging.

Appendix Table 3. Group 2: Nonoperative Management

Round 1

- (1) What are the indications for nonoperative management?
- (2) What are the contraindications for nonoperative management?
- (3) If a patient is undergoing nonoperative management, for how long should it be trialed before undergoing operative fixation?
- (4) What prognostic factors should be considered in patients undergoing nonoperative management?
- (5) Does immobilization play a role in the nonoperative management of posterior shoulder instability? If so, for what duration of time? What arm position? Should an abduction pillow be used?
- (6) When should patients start shoulder range-of-motion exercises?
- (7) When should patients start resistance training exercises?
- (8) When should patients start sport-specific training exercises?
- (9) Do corticosteroids play a role in nonoperative management?
- (10) Do orthobiologics play a role in nonoperative management?

Round 2

Which of the following do you agree are relative indications for nonoperative management?

- First-time dislocator
- Uncontrolled seizure disorder
- Ligamentous laxity/connective tissue disorder
- Subluxations without dislocation
- Dynamic functional instability
- Static instability
- Timing in-season to allow for return to play
- Patient preference to avoid surgery
- Low functional demand

Which of the following do you agree are relative contraindications for nonoperative management?

- Recurrent dislocators
- Failed closed reduction
- Severe glenoid bone loss
- Collision athletes
- Competitive athletes
- Batter's shoulder
- Younger athletes
- Gamma angle $>90^\circ$ and/or posterior decentering
- Dynamic instability with relevant structural defects
- Functional instability in the young and active

If a patient is undergoing nonoperative management for a traumatic dislocation, for how long should it be trialed before undergoing operative stabilization?

- Minimum of 6 weeks of PT
- Minimum of 12 weeks of PT
- Minimum of 6 months of PT
- Until recurrent dislocation

If a patient is undergoing nonoperative management for a dynamic instability, for how long should it be trialed before undergoing operative stabilization?

- Minimum of 6 weeks of PT
- Minimum of 12 weeks of PT
- Minimum of 6 months of PT

If a patient is undergoing nonoperative management for a static instability, for how long should it be trialed before undergoing operative stabilization?

- Minimum of 6 weeks of PT
- Minimum of 12 weeks of PT
- Minimum of 6 months of PT

Which of the following do you agree are prognostic factors for nonoperative management?

- Age
- Activity level
- Occupation
- Sports participation
- Previous injury
- Number of dislocation events
- Underlying etiology
- Hyperlaxity
- Glenoid bone loss
- Glenoid retroversion
- Connective tissue disorder
- Contact athlete with posterior loading
- Gamma angle according to Festbaum et al.
- Bilateral instability

- Body mass index
- Structural insufficiencies like glenoid flattening, etc
- Retroversion
- Scapulohumeral and glenohumeral decentering
- Glenoid offset
- Osteoarthritis

Does immobilization play a role in the nonoperative management of posterior shoulder instability after a traumatic dislocation?

- Yes
- No

If so, for what duration of time?

- 1 week
- 2 weeks
- 3 weeks
- For comfort

What arm position?

- Internal rotation
- Neutral rotation
- No difference

Should an abduction pillow be used?

- Yes
- No

After a traumatic instability event, patients should start shoulder range-of-motion exercises after 1-2 weeks once comfort permits.

- Yes
- No

Do you agree with this statement?

If not, why not?

After a traumatic instability event, patients should start resistance training exercises once full range of motion is restored and patients can perform the exercises without apprehension.

- Yes
- No

Do you agree with this statement?

If not, why not?

After a traumatic instability event, patients should start sport-specific training once full range of motion and strength are dependent on the timing of the season.

- Yes
- No

Do you agree with this statement?

If not, why not?

After a traumatic instability event, is there a timeline for when patients should start sport-specific training exercises?

- No; based on individual patient
- Yes; minimum of 6 weeks
- Yes; minimum of 8 weeks
- Yes; minimum of 10 weeks
- Yes; minimum of 12 weeks

There is no role for corticosteroids or orthobiologics in the nonoperative management of traumatic posterior shoulder instability.

- Yes
- No

Do you agree with this statement?

If not, why not?

Round 3

Q: What are the indications for nonoperative management?

A: The relative indications for nonoperative management are

- (1) first-time dislocator
- (2) uncontrolled seizure disorder
- (3) ligamentous laxity/connective tissue disorder
- (4) subluxations without dislocation
- (5) dynamic functional instability
- (6) timing in-season to allow for return to play
- (7) patient preference to avoid surgery
- (8) low functional demand

Do you have any suggested changes?

Q: What are the contraindications for nonoperative management?

A: The relative contraindications for nonoperative management are

- (1) recurrent dislocators
- (2) failed closed reduction
- (3) severe glenoid bone loss
- (4) collision athletes
- (5) batter's shoulder

- (6) gamma angle $>90^\circ$ and/or posterior decentering
- (7) dynamic instability with relevant structural defects
- (8) functional instability in the young and active

Do you have any suggested changes?

Q: If a patient is undergoing nonoperative management, for how long should it be trialed before undergoing operative fixation?

A: If a patient is undergoing nonoperative management, a minimum of 12 weeks should be trialed before undergoing operative fixation unless there is a further dislocation.

Do you have any suggested changes?

Q: Does immobilization play a role in the nonoperative management of posterior shoulder instability? If so, for what duration of time? What arm position? Should an abduction pillow be used?

A: Yes, immobilization plays a role in a role and patients should be immobilized for 2-3 weeks in neutral rotation. There is no established benefit to an abduction pillow.

Do you have any suggested changes?

Q: When should patients start shoulder range-of-motion exercises?

A: After a traumatic instability event, patients should start shoulder range-of-motion exercises after 1 to 2 weeks once comfort permits.

Do you have any suggested changes?

Q: When should patients start resistance-training exercises?

A: After a traumatic instability event, patients should start resistance training exercises once full range of motion is restored and patients can perform the exercises without apprehension.

Do you have any suggested changes?

Q: When should patients start sport-specific training exercises?

A: After a traumatic instability event, patient should start sport-specific training exercises once full range of motion and strength are restored, dependent on the timing in the season.

Do you have any suggested changes?

Q: Do corticosteroids/orthobiologics play a role in nonoperative management?

A: There is no role for corticosteroids or orthobiologics in the nonoperative management of posterior shoulder instability.

Do you have any suggested changes?

PT, physical therapy.

Appendix Table 4. Group 3: Labral Repair

Round 1

- (1) Which of the following do you agree are relative indications for labral repair?
- (2) Which of the following do you agree are relative contraindications for Labral repair?
- (3) Is there an amount of glenoid bone loss above which a labral repair should not be performed?
- (4) Which prognostic factors should be considered in patients undergoing a labral repair?
- (5) Does the extent of a posterior labral repair change if the anterior labrum needs to be repaired as well?
- (6) When should a capsular plication be performed over a labral repair?
- (7) When should a posterior capsular repair be performed?
- (8) When should a posterior capsular reconstruction be performed?
- (9) What graft should be used?
- (10) What are the indications for performing concomitant reverse remplissage with a labral repair?
- (11) What are the indications for performing concomitant biceps tenodesis with a labral repair?
- (12) Should labral repair be performed in the beach/captain's chair or lateral decubitus position, and why?
- (13) What steps should be taken to minimize complications after a labral repair procedure?
- (14) Is a posteroinferior portal necessary? Should knotless or knotted anchors be used?
- (15) What is the optimal number of anchors when performing a posterior labral repair?
- (16) How far apart should anchors be placed when performing a labral repair?
- (17) Where should the lowest and highest anchor be placed when performing a labral repair in a right shoulder with regards to the clock face?

Round 2

Which of the following do you agree are relative indications for labral repair?

- First-time dislocations
- Symptomatic instability
- Recurrent dislocations
- Pain
- Symptomatic labral tear (i.e., pain/instability symptoms)
- Labral tear on MRI
- Functional limitations
- Positive physical examination findings
- Failed physical therapy

Which of the following do you agree are relative contraindications for labral repair?

- First-time dislocation
- Static instability
- Severe glenoid bone loss
- Osteoarthritis
- Stiffness
- Likelihood of poor compliance with postoperative rehabilitation
- Uncontrolled epilepsy
- Older
- Irreparable tear pattern
- Asymptomatic tear (i.e., no pain/instability)

Is there an amount of glenoid bone loss above which a labral repair should not be performed?

- 15%
- 20%
- 25%
- No cut-off

Which prognostic factors should be considered in patients undergoing a labral repair?

- Age
- Gender
- Hand dominance
- Preoperative pain
- Glenoid bone loss
- Reverse Hill-Sachs lesion
- Glenoid version
- Ligamentous laxity
- Functional demand
- Competitive athlete
- Military personnel
- Collision athlete
- Overhead athlete
- Number of preoperative dislocations
- Previous shoulder surgery
- Hyperlaxity
- Arthritic change
- Centralization of humeral head

- Expectations
- Ability to comply with postoperative

Does the extent of a posterior labral repair change if the anterior labrum needs to be repaired as well?

- Yes
- No How should it affect your repair?

When should a capsular plication be performed over a labral repair? The majority stated never in isolation, but it may be useful as an adjunct, which of the following do you agree are indications?

- Routinely
- Never
- Consider with ligamentous/capsular laxity
- Consider with concomitant anterior instability

When should a posterior capsular repair be performed?

- Routinely when the capsule is torn/avulsed
- Portals should routinely be closed
- Never

When should a posterior capsular reconstruction be performed?

- Never indicated
- Never indicated, bone graft should be used if there is a capsular defect and significant tissue loss
- Never indicated, bone graft should be used if there is a collagen disorder
- Rarely, but in those with capsular defect and significant volume tissue loss
- Rarely, but in those with collagen disorder

Should dermal allograft be used if a capsular reconstruction is needed?

- Yes
- No What graft should be used?

What are the indications for performing concomitant reverse remplissage with a labral repair?

- Engaging reverse Hill-Sachs
- Large reverse Hill-Sachs
- Reverse Hill-Sachs with associated glenoid bone loss
- Revision labral repair with a reverse Hill-Sachs lesion

Which of the following are the indications for performing concomitant biceps tenodesis with a labral repair?

- Concomitant superior labral tear extending into LHBT anchor
- Concomitant LHBT tear/injury
- Concomitant LHBT instability
- Positive O'Brien test
- Positive bicipital groove pain

Should labral repair be performed in the beach/captain's chair or lateral decubitus position, and why?

- Surgeon's preference
- Lateral decubitus
- Beach chair

Complications, other than recurrence, are rare after a labral repair procedure. However, which of the following do you think may help minimize complications including recurrence?

- Attention to detail
- Well-defined rehabilitation protocol
- Strict postoperative immobilization
- Inferior anchor placement
- Multiple anchor fixation points
- Small anchors to minimize postage-stamp fractures
- Knotless anchors to minimize chondral irritation
- Treat concomitant pathologies
- Careful capsulolabral debridement and reattachment
- Appropriate indication and assessment of risk factors
- Creating a bumper with the labrum
- Recognition of abnormalities in glenohumeral morphology (i.e., bone loss, version, etc)

Is a posteroinferior portal necessary? Should knotless or knotted anchors be used?

- Yes; routinely
- Yes; if there is a posteroinferior extension
- No; never

Should knotless or knotted anchors be used?

- Surgeon preference
- Knotless routinely

What is the optimal number of anchors when performing a posterior labral repair?

- Minimum of 2, but more extensive if required for the tear
- Minimum of 3, but more extensive if required for the tear
- Minimum of 4, but more extensive if required for the tear
- No minimum, based on tear, one anchor per clock face segment

How far apart should anchors be placed when performing a labral repair?

- 5-8 mm
- 8-10 mm

- 1-1.5 cm
- 1.5-2 cm

Where should the lowest and highest anchor be placed when performing a labral repair in a right shoulder with regards to the clockface

- 7 o'clock
- 6:30 o'clock
- 6 o'clock
- 5:30 o'clock

Where should the highest anchor be placed when performing a labral repair in a right shoulder with regards to the clockface?

- 11 o'clock
- 10 o'clock
- 9 o'clock

Q: What are the indications for labral repair?

A: The relative indications for labral repair are

- (1) first-time dislocations
- (2) symptomatic instability
- (3) recurrent dislocations
- (4) pain
- (5) symptomatic labral tear (i.e., pain/instability symptoms)
- (6) functional limitations
- (7) positive physical examination findings
- (8) failed physical therapy

Do you have any suggested changes?

18) Q: What are the contraindications for labral repair?

A: The relative contraindications for labral repair are

- (1) severe glenoid bone loss
- (2) osteoarthritis
- (3) stiffness
- (4) likelihood of poor compliance with postoperative rehabilitation
- (5) uncontrolled epilepsy
- (6) irreparable tear pattern
- (7) asymptomatic tear (i.e., no pain/instability symptoms)

Do you have any suggested changes?

Q: Is there an amount of glenoid bone loss above which a labral repair should not be performed?

A: There is no amount of glenoid bone loss above which a labral repair should not be performed; however, above 15% to 20% there should be consideration for a block-block procedure.

Do you have any suggested changes?

Q: Does the extent of a posterior labral repair change if the anterior labrum needs to be repaired as well?

A: No the extent of a posterior labral repair does not change if the anterior labrum needs to be repaired as well.

Do you have any suggested changes?

Q: When should a capsular plication be performed over a labral repair?

A: A capsular plication should never be performed over a labral repair, but it may be useful as an adjunct in those with ligamentous/capsular laxity.

Do you have any suggested changes?

Q: When should a posterior capsular repair be performed?

A: A posterior capsular repair should routinely be performed when the capsule is torn/avulsed.

Do you have any suggested changes?

Q: When should a posterior capsular reconstruction be performed? What graft should be utilized?

A: A posterior capsular reconstruction is rarely indicated, but it may be in those with capsular defect and significant volume tissue loss. A dermal allograft should be used.

Do you have any suggested changes?

Q: What are the indications for performing concomitant reverse remplissage with a labral repair?

- A: The relative indications for labral repair are (1) engaging reverse Hill-Sachs
- (2) reverse Hill-Sachs with associated glenoid bone-loss
 - (3) revision labral repair with a reverse Hill-Sachs lesion

Do you have any suggested changes?

Q: What are the indications for performing concomitant biceps tenodesis with a labral repair?

- A: The relative indications for performing concomitant biceps tenodesis with a labral repair are (1) concomitant superior labral tear extending into LHBT anchor,
- (2) concomitant LHBT tear/injury,
 - (3) concomitant LHBT instability.

Do you have any suggested changes?

Q: Should labral repair be performed in the beach/captain's chair or lateral decubitus position, and why?

A: Labral repair should be performed in the beach/captain's chair or lateral decubitus position based on surgeon preference.

Do you have any suggested changes?

Q: What steps should be taken to minimize complications after a labral repair procedure?

A: Complications, other than recurrence, are rare after a labral repair procedure. However, steps that may reduce complications include (1) attention to detail

- (2) appropriate indication and assessment of risk factors
- (3) Recognition of abnormalities in glenohumeral morphology (i.e., bone loss, version,)
- (4) careful capsulolabral debridement and reattachment
- (5) inferior anchor placement
- (6) multiple anchor fixation points
- (7) small anchors to minimize postage-stamp fracture
- (8) creating a bumper with the labrum
- (9) treat concomitant pathologies
- (10) well-defined rehabilitation protocol
- (11) strict postoperative immobilization

Do you have any suggested changes?

Q: Is a posteroinferior portal necessary?

A: Yes, a posteroinferior portal is necessary.

Do you have any suggested changes?

Q: Should knotless or knotted anchors be used?

A: Knotless or knotted anchors can be used based on surgeon preference.

Do you have any suggested changes?

Q: What is the optimal number of anchors when performing a posterior labral repair?

A: A minimum of 3 anchors should be used, but more should be utilized if required for the tear.

Do you have any suggested changes?

Q: How far apart should anchors be placed when performing a labral repair?

A: Anchors should be placed every 30° on the circumference of the glenoid.

Do you have any suggested changes?

Q: Where should the lowest and highest anchor be placed when performing a labral repair in a right shoulder with regards to the clockface?

A: The lowest anchor should be placed between 6-6:30, and the highest anchor should be placed between 10 and 11.

Do you have any suggested changes?

LHBT, long head of biceps tendon; MRI, magnetic resonance imaging.