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# Current trends in the evaluation and treatment of SLAP lesions: analysis of a survey of specialist shoulder surgeons

Kemble K. Wang, MBBS, FRACS [a,b], Matthew Yalizis, MBBS, FRACS [a,b], Gregory A. Hoy, MBBS, FRACS [a,b], Eugene T. Ek, MBBS, PhD, FRACS [a,b,*]

[a] *Melbourne Orthopaedic Group, Windsor, VIC, Australia*
[b] *Department of Surgery, Monash Medical Centre, Monash University, Melbourne, VIC, Australia*

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**Background:** Controversies exist in the classification and management of superior labral anterior and posterior (SLAP) lesions. Our aims were to assess the concordance rate of a group of specialist shoulder surgeons on the diagnosis of SLAP types and to assess the current trends in treatment preferences for different SLAP types.

**Methods:** Shoulder surgeons (N = 103) who are members of the Shoulder and Elbow Society of Australia were invited to participate in a multimedia survey on the classification and management of SLAP lesions. Response rate was 36%. The survey included 10 cases, each containing a short clinical vignette followed by an arthroscopic video depicting varying types of SLAP lesions. Surgeons were asked to classify the lesions and to recommend treatment.

**Results:** There is low interobserver agreement in classifying SLAP lesions. The most common misdiagnosis of type I lesion was as a type II, and vice versa. Surgeons preferred to treat type II SLAP lesions in younger patients (<35 years) with labral repair and in older patients with biceps tenodesis. The most commonly preferred repair technique for type II lesion was with suture anchors placed both anterior and posterior to the biceps tendon. For all lesion types, biceps tenotomy was a far less commonly preferred procedure than biceps tenodesis.

**Conclusion:** There is poor agreement between contemporary surgeons in the classification and treatment of SLAP lesions. The age of the patient appears to play a significant factor in the surgeons' deciding to treat a SLAP lesion with repair vs. biceps tenodesis.



Since being first described by Andrews et al[1] in 1985, there has been increasing recognition and understanding of superior labral anterior-posterior (SLAP) lesions as a cause of shoulder pain. As the literature on this condition has expanded, our understanding of SLAP lesions remains imperfect, and controversies continue to exist on its diagnosis, classification, treatment options, and techniques of repair.

An initial classification system of SLAP lesions was proposed by Snyder[16] in 1990 and consisted of 4 types. This system, however, was not inclusive of some SLAP morphologic appearances, and soon an expanded system was introduced by Maffet et al[12] that incorporated types V-VII. Several studies have investigated the reliability of the Snyder classification system and reported only low to moderate interobserver and intraobserver reliability.[9,10] Limitations exist with these studies; 1 study was performed >10 years ago,[9] and increasing understanding of SLAP lesions among shoulder surgeons in the last decade may affect interobserver concordance today. Another study investigated reliability between only 5 very experienced shoulder surgeons,[10] and so findings cannot be generalized to the broader community of shoulder surgeons who may use the classification. Moreover, no study has investigated the reliability of a system that includes Maffet's expansion of Snyder's classification, which is often used in practice today.

Surgical management of SLAP lesions also remains controversial. Whereas débridement is generally advocated in the treatment of type I and type III lesions, there is less consensus for the treatment of the more common type II lesions.[3] Management options include débridement, SLAP repair, biceps tenodesis or tenotomy, and a combination of these. Some authors advocate superior labral repair for type II lesions,[11,14] whereas others advocate judicial discrimination of patients who will benefit from a tenodesis more than from labral repair.[2,7] In particular, 2 subgroups of type II lesions may derive

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The Avenue Hospital Institutional Ethics Review Board approved this study: No. 207.

* Corresponding author: Eugene T. Ek, MBBS, PhD, FRACS, Melbourne Orthopaedic Group, 33 The Avenue, Windsor, Melbourne, VIC 3181, Australia.
*E-mail address:* eugene.ek@me.com (E.T. Ek).

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greater benefit from tenodesis over labral repair—an older group of patients with poorer quality, degenerate labrum; and a younger group with high overhead functional demands.

Given the current controversies, this study aimed to assess the concordance rate of a group of shoulder surgeons of the Shoulder and Elbow Society of Australia on the diagnosis of SLAP types, as defined by Snyder and Maffet; to assess the current trend in treatment preference among shoulder surgeons for different SLAP types; and to assess surgeons' preferences for either SLAP repair or biceps tenodesis, based on clinical setting.

## Materials and methods

The study was conducted using a multimedia online survey format. Members of the Shoulder and Elbow Society of Australia (N = 103) were contacted by e-mail inviting participation. All surgeons, by virtue of their membership in this Society, have a subspecialty practice in shoulder and elbow surgery and have undergone fellowship training in this area. Thirty-seven of the surgeons surveyed gave complete responses that were used for analysis (36% response rate).

The cases of 10 patients were presented to surgeons. A short hypothetical vignette with the patient's age and presenting complaints was included together with an arthroscopic video of approximately 40 seconds in duration. Videos were carefully selected from the 2 senior surgeons' cases and were chosen and edited to clearly demonstrate the full extent of the involved lesions. The view was with the arthroscope in the posterior portal and the probe through the anterior portal. All lesions were probed thoroughly during the video, and an attempt to demonstrate a "peel-back" sign[4] was performed in all cases. The average hypothetical age of the patients was 32 years, with a range of 15-47 years.

Surgeons were told that other than the SLAP and labral pathologic processes depicted in the videos, there were no other diseases in or around the shoulder. The options were per Maffet's expansion of Snyder's classification (types I-VII). Shoulders with Buford complex were excluded to minimize variables. On each page of the survey, a pictorial description of the 7 SLAP types was provided for reference. Surgeons were then asked to select their treatment of choice for each hypothetical case. More type II SLAP lesions were included than other lesions, as this was deemed to be the most common type.

"True diagnosis" is defined as the SLAP classification type that is agreed on between the 2 senior authors. In every case, 1 of the senior authors was the operating surgeon who took the video and therefore had an intimate intraoperative knowledge of the nature of the SLAP lesion.

### *Statistics*

Interobserver variability (concordance) of the 37 different observers was calculated using chance-corrected Fleiss κ. Difference in treatment by age group of the patients was calculated using $\chi^2$ contingency test. Difference in continuous variables, such as the surgeon's years of practice, were calculated using 2-tailed Student *t*-test, whereas ordinal variables were compared with Wilcoxon ranked sum. Correlation testing between nonparametric ordinal variables was performed using Spearman rho.

## Results

Practice details of surgeons who responded are presented in Table I. There is a wide range of experience among participants, with most surgeons (54%) performing >200 shoulder arthroscopies per year.

**Table I**
Characteristics of 37 participating surgeons

| Characteristic | No. (%) |
|---|---|
| Years in practice | |
| <5 | 6 (16) |
| 5-10 | 8 (22) |
| 11-20 | 15 (41) |
| >20 | 8 (22) |
| Scope volume per year | |
| 1-50 | 2 (5) |
| 50-100 | 6 (22) |
| 100-200 | 9 (24) |
| >200 | 20 (54) |

### *Interobserver variability on classification system (concordance)*

The surgeons' diagnosis and treatment decision choices are displayed in Table II. Concordance rate is relatively low for classification of lesions, with an overall κ value of 0.26 (fair agreement). Concordance rate for agreeing on a type IV diagnosis is highest with a κ value of 0.49 (moderate agreement), whereas concordance rate is lowest for type V (κ = 0.09, slight agreement).

Misdiagnosis often occurred between type I and type II lesions. For example, in a case with a type II lesion, the most common alternative choice made by surgeons was type I, and vice versa.

### *Treatment preference*

Treatment options are divided into 4 categories: débridement/nonspecific treatment; tenotomy or tenodesis alone; SLAP repair alone; or both tenotomy/tenodesis and SLAP repair. Débridement/nonspecific treatment was the most common choice for type I lesion, whereas SLAP repair was the most common choice for all other lesion types in this study (Table II).

**Table II**
Diagnosis and treatment decisions

| Type of lesion | Diagnosis | % | Treatments | % |
|---|---|---|---|---|
| SLAP I (1 case) | **SLAP I** | **49** | **Débridement/nonspecific** | **54** |
| | **SLAP II** | **49** | Tenotomy/tenodesis | 0 |
| | SLAP III | 0 | SLAP repair | 43 |
| | SLAP IV | 0 | Tenotomy/tenodesis and | 3 |
| | SLAP V | 3 | SLAP repair | |
| | SLAP VI | 0 | | |
| | SLAP VII | 0 | | |
| SLAP II (6 cases) | SLAP I | 20 | Débridement/nonspecific | 22 |
| | **SLAP II** | **70** | Tenotomy/tenodesis | 29 |
| | SLAP III | 0.5 | **SLAP repair** | **42** |
| | SLAP IV | 0.5 | Tenotomy/tenodesis and | 7 |
| | SLAP V | 4 | SLAP repair | |
| | SLAP VI | 1 | | |
| | SLAP VII | 4 | | |
| SLAP IV (2 cases) | SLAP I | 0 | Débridement/nonspecific | 14 |
| | SLAP II | 5 | Tenotomy/tenodesis | 31 |
| | SLAP III | 15 | **SLAP repair** | **42** |
| | **SLAP IV** | **57** | Tenotomy/tenodesis and | 14 |
| | SLAP V | 8 | SLAP repair | |
| | SLAP VI | 3 | | |
| | SLAP VII | 12 | | |
| SLAP V (1 case) | SLAP I | 3 | Débridement/nonspecific | 11 |
| | SLAP II | 16 | Tenotomy/tenodesis | 27 |
| | SLAP III | 3 | **SLAP repair** | **46** |
| | SLAP IV | 22 | Tenotomy/tenodesis and | 16 |
| | **SLAP V** | **30** | SLAP repair | |
| | SLAP VI | 0 | | |
| | SLAP VII | 27 | | |

Response of 37 surgeons to 10 cases. Overall concordance rate for diagnosis: κ = 0.26 (fair agreement), $P < .001$. Overall concordance rate for treatment: κ = 0.09 (slight agreement), $P < .001$.

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