

The Thrower's Shoulder

Part I: Diagnosis and Early Treatment

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Dr. Dugas



Dr. Crockett



Dr. Eaton



Dr. Paletta



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What Is Unique About the Thrower's Shoulder?

Dr. Dugas: We will begin by defining how the thrower's shoulder is different from other shoulders, what is unique about the thrower's shoulder, beginning with the anatomic differences and proceeding to the physiologic differences. Dr. Crockett, could you discuss the anatomic variations that are present in the thrower's shoulder.

Dr. Crockett: We found an increased humeral head retroversion in the throwing arm compared with the non-dominant arm and also an increased humeral head retroversion in the dominant arm versus a control group. Our study showed that in non-injured throwers there was up to 40° of retroversion, and I believe your study showed that patients with intra-articular pathology and over 28°

of retroversion are more symptomatic. Another issue is that, obviously, the throwers' shoulders are undergoing a lot more stress than the average shoulder. Therefore, they may be relying more heavily on dynamic stabilizers than the average shoulder.

Dr. Dugas: Dr. Paletta, any comments about range of motion in the thrower versus the non-thrower?

Dr. Paletta: I think it is well accepted that the throwing shoulder will show increased external rotation and decreased internal rotation compared with the non-throwing shoulder. It is also now understood that this is the result of bony adaptations of increased humeral head retroversion. Less well understood is the contribution of attenuation of the static stabilizers such as the posterior capsule to this altered arc of motion. Certainly most throwers, at least the elite, high-level throwers, show a relative increase in external rotation versus their non-dominant throwing arm and a relative loss of internal rotation, but those with a healthy shoulder will, fairly consistently, have a total arc of motion that is similar for both arms.

Dr. Eaton: Does this happen when kids start playing baseball at a very early age and therefore traumatize their arm? In the Tampa area, where baseball is king and you see a lot of Little Leaguers' shoulders, Bill Carson studied the incidence of

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fractures in the developing arm with x-ray and CT (Carson and Gasser; *Am J Sports Med.* 1998;26[4]:575-580). This study and yours suggest that maybe what we're seeing are fractures at the growth plate in which the retroversion is starting to take place and that sometimes these Little Leaguers' shoulders are just a result of this retroversion taking place. It would be really interesting to quantitate what happens. Perhaps instead of doing physicals on major league pitchers, we should be doing physicals on Little League pitchers and Little League players, just testing their arms to see at what point they start cranking in the external rotation.

Dr. Dugas: Dr. Timmerman, I know you have dealt with a lot of adolescents. Do you have any further comments about the developmental aspect of throwing?

Dr. Timmerman: I see imbalances develop, not just with internal and external rotational range of motion; it seems as if they'll get tight posteriorly and develop subtle imbalances, which, if missed in rehab, can lead to injury.

The Spectrum of Injuries

Dr. Dugas: Let's move on to the scope of injury in the thrower's shoulder. What are the true pathologies we're seeing at all ages in the thrower's shoulder?

Dr. Timmerman: One of the more common problems I have seen in young throwers is proximal humerus epiphysitis, or Little League shoulder. It was missed a lot by my referral sources. I had one kid who was given a diagnosis of Ewing's sarcoma based on a hot bone scan and was referred to the university to have his arm amputated. These problems occur even in the primary care world, and they're not recognized. They see a hot bone scan and they panic. In the college-age group I take care of, the most common thing I see is probably superior labral tear, undersurface cuff tear, and the problem of trying to decide whether it's laxity or instability and whether it's symptomatic or not.

Dr. Dugas: In our practice we're very careful about using those terms. You bring up a very interesting point regarding the difference between instability and laxity, where instability represents a pathologic condition and laxity represents almost a necessary increase in the range of shoulder motion that the thrower needs to generate torque. We're very careful about using the term instability. Distinguishing between laxity and instability is a very delicate matter. Certainly pathologic laxity may predispose a shoulder to a variety of injuries.

Dr. Eaton, is the pathology you're seeing at the major league level any different from what we're seeing at the college and adolescent levels?

"Distinguishing between laxity and instability is a very delicate matter"

Dr. Eaton: The big difference is age, obviously. At the major league level, especially since we are an expansion team, we're getting athletes a little bit later on in their careers, when rotator cuff pathology has become very prevalent. We have found a number of nearly full thickness cuff tears. Débridement doesn't get these players back to work. So we actually have detached and reattached some intact rotator cuffs, thinking that what we're seeing is just a slim portion of the undersurface cuff and that most of the tendinous portion of the rotator cuff has actually detached and retracted. That is, after all, the tensile structure that supplies most of the force to depress the humeral head. The big difference is that, in the major leaguers, you're tending to think more of rotator cuff pathology, whereas in the younger kids you are more apt to be defining a difference between instability and general laxity.

Dr. Dugas: Dr. Paletta, is your experience in dealing with minor league and major league players the same as Dr. Eaton's, and have you seen any articular surface injuries in your throwing athletes?

Dr. Paletta: Within the professional baseball team I care for, I see a spectrum of pathology in the major league pitchers clearly different from what I see in the minor league throwers. Part of that may be due to the level of attention from the training staff that the major leaguers get as opposed to the minor leaguers. The minor leaguers generally tend to be younger guys, but I still see a lot more posterior capsular tightness with true loss of internal rotation and a diminished arc of motion, because the training staff of one doesn't have the time to spend hands-on with them to do shoulder mobilizations and stretching. They have more posterior shoulder pain and are probably at risk for internal impingement, posterior labral tears, and SLAP lesions because of that.

In the 25- to 30-year-old group of major leaguers we tend to see less of those problems and more problems related to subtle underlying laxity. It's in the over-30 age group that we start getting true cuff pathology, moderate or severe tendinopathy, even partial-thickness cuff tears of the supraspinatus as opposed to the internal impingement undersur-

face tear. I definitely see a difference between the major leaguers and the minor leaguers and between the younger and the older population.

Dr. Dugas: How about articular cartilage injuries? Are we seeing a lot of articular injuries, OCDs, wearing and tearing on the joint surfaces, at the college, the minor league, or the professional level in throwers?

Dr. Paletta: In my experience in taking care of the elite thrower, I can probably count on one hand, and certainly on no more than two hands, the number of significant articular cartilage injuries that I can recall. It's just not something that is very frequent in the population I see.

Dr. Timmerman: I may see one or two lesions of the glenoid, but they are not really common in my practice, either.

Dr. Crockett: I have seen it but in very low incidence, and they tend not to stick around. The ones I've taken care of tend not to make it.

Dr. Dugas: To summarize: I think what we're saying is that at lower levels of throwing, posterior capsular tightness, posterior labral lesions, and SLAP lesions tend to be more of an issue. As the population ages and increases in level, we're seeing more severe tensile injuries to the rotator cuff and perhaps more subacromial impingement-type lesions as the osseous structures become more of a problem.

Dr. Eaton: To take it a step further, at least in the high school and the Babe Ruth and pony leagues, the one or two kids who are the dominant pitchers on those teams are the kids in whom you see a lot of the overuse problems, because they're pitching every other day or they're pitching 5 days a week. The spectrum of pathology in that group of throwers is one of cuff tendinitis, severe overuse problems. Fortunately, as they get higher up in the elite throwing ranks, they're used in a wiser fashion, and you don't see that quite as often.

Mechanism of Injury

Dr. Dugas: Let's move on then to mechanisms of injury, and the different terms that we use to describe the pathology we see in throwers' shoulders, specifically things like internal impingement. Dr. Crockett, can you define and describe to us what internal impingement is and how it occurs?

Dr. Crockett: Stealing from Dr. (James R.) Andrews' terminology, internal impingement is a kind of over-rotation injury. In extreme external rotation, the posterior superior cuff can be pulled down over the posterior superior labrum, causing fraying and tears. I see, most commonly, longitudi-

nal tears of the labrum posteriorly with undersurface fraying of the rotator cuff. That's the real internal impingement, as opposed to a SLAP, which is actually more anterior and superior on the labrum. That's very common; you see it quite a bit.

Dr. Dugas: In regard to the labrum, we talk about the peel-back phenomenon and rotational laxity in the shoulders. Dr. Timmerman, will you describe the peel-back mechanism and maybe the role played by the biceps tendon behind the axis of the humeral head?

Dr. Timmerman: Well, John Conway of Fort Worth, Texas, talks about the weed-pulling theory, which holds that the biceps tendon, like a weed, gets trapped between the humeral head and the glenoid when the shoulder is abducted and externally rotated, toggling on it and loosening the labrum. Through the arthroscope, you're trying to decide whether that patient has a natural recess under the labrum or whether it's actually been detached and moved back. The labrum can actually lift up off the back of the glenoid and then come back down, allowing you to insert something under there fairly easily.

Dr. Dugas: And the mechanism for that is a change in the vector pull on the biceps at extreme external rotation.

Dr. Timmerman: Correct.

Dr. Dugas: Although we've talked about the anatomic differences with rotation, the two major pathologies we're seeing that have a discrete mechanical cause seem to be the kind of superior labral lesions that peel back and internal impingement.

Dr. Timmerman: When I went through training, before the idea of internal impingement was popular, the excess distraction after ball release was thought to be the mechanism for this injury. Decelerating forces trying to fire and stabilize the shoulder created posterior cuff tension injury.

Dr. Paletta: In Steve Snyder's original article in *Arthroscopy* 1990 (6;274-279) describing SLAP tears, only a small percentage of his patients undergoing arthroscopy were noted to have a SLAP lesion. However, as the concept of SLAP tear became more widely known, all of a sudden everybody has a SLAP tear. Internal impingement is now a concept that is gaining popularity, and it is being overdiagnosed. What really constitutes true internal impingement? Do you have to have a kissing lesion between the undersurface of the cuff and the posterior labrum? Is one or the other enough, or is it just a constellation of clinical symptoms in the setting of a tight posterior capsule that lets you make that diagnosis? We may be overdiagnosing the problem.

Dr. Timmerman: But do people who trained when I did still believe in posterior distraction? With all this new information, we wonder whether that even still exists.

Dr. Crockett: Or is it a combination of both?

Dr. Eaton: Arthroscopy looks at a static situation, but we know that throwing is anything but static. So whether you do your scopes in a beach-chair position where you can bring the arm up to the top position, or you do your scopes in the lateral position, unhooking the weights and bringing the arm up to see if it is a true kissing lesion, you're still just taking a snapshot of a moving picture.

Dr. Dugas: It's not physiologic; you don't have any of the dynamics.

Dr. Eaton: Nothing is firing.... It's tough—the feeling is that it's a constellation. It's like having a small meniscus tear. Once you get a little tear, that area can become detached and peel back even further. Does it really matter what caused that little flap, now that it is big enough to become a source of internal impingement and enlarge the pathology? So maybe it's the combination of an initial distraction causing the flap, which then irritates and causes the internal impingement. I can see how both theories could be put to work so that one is not mutually exclusive of the other.

DIAGNOSTIC ISSUES

Dr. Dugas: Dr. Paletta, at this time of the year we see a lot of throwers with sore shoulders. They have extreme forces placed on their shoulders in the course of throwing countless pitches in spring training. How do we differentiate the routine spring training sore shoulder from true shoulder pathology? How do we diagnose these? In your hands, what has been the best way to approach the diagnosis of shoulder problems in these athletes?

Physical Exam Tests

Dr. Paletta: Different authors have talked a lot about trying to differentiate the potential causes of anterior and posterior shoulder pain. I have not been that impressed that localization of the pain necessarily gives you significant clues to the underlying pathology in these cases. The two diagnostic considerations that are the most important and most useful in my hands are: 1) what phase of throwing these patients have their pain in and 2) what your careful physical exam tells you. Unfortunately, there is no one gold standard test for differentiating these problems, particularly

internal impingement and/or SLAP tears, which are two of the more common ones. There is not a Lachman test or pivot shift as there is with the ACL.

Dr. Dugas: What would you say is the best physical exam test in your hands? I agree with you wholeheartedly about the phase of throwing—I think that's as important as anything. But is there a particular test for internal impingement that you think is better than others?

Dr. Paletta: There's not one, but a combination. Certainly I'd pay careful attention to the degree of glenohumeral laxity/patho-laxity, although there's a very fine line that can be difficult to differentiate. I pay careful attention to the total passive arc of motion on the throwing versus the non-throwing side, particularly if you're looking at posterior capsular contractions. Patients who have a posterior capsular contraction are a set-up for internal impingement, so one makes me suspect the other. In terms of SLAP and labral signs, I think Kibler's anterior slide test and O'Brien's test are both helpful. But I don't think either of them, at least in my

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hands, is as sensitive and specific as the original descriptions suggest. I also use (William G.) Clancy's circumduction-adduction test and Andrews' supine SLAP test. I end up using sort of a Gestalt of all of those put together. If I can reproduce a thrower's pain in a maximum external rotation position—such as the posterior impingement sign or crank test—that also helps me home in on the diagnosis. But there's not one single test that I would dare hang my hat on.

Dr. Dugas: Dr. Crockett, how do you approach the diagnosis from a physical exam standpoint?

Dr. Crockett: Much the same as Dr. Paletta. Obviously the history in a thrower is paramount in the evaluation: when did it start hurting, and what phase of throwing does it hurt in? I, like you, am probably biased in favor of the one physical finding that I have relied heavily on for SLAP lesions, Andrews' supine SLAP test. We kept charts. We've been about 86% accurate with it. This test is performed by laying the patients supine and flexing their shoulder to 180° with the elbow flexed to 90° and the hand pointing towards the floor. The elbow is then held in place, and the hand is grasped by the examiner and used to internally rotate the shoulder. If they get really sharp pain

with that, the MRI usually confirms the diagnosis. It's not perfect, but I rely very heavily on it.

I also perform the circumduction/abduction test that Clancy does. This test is performed by allowing the patient's arm to hang at his/her side and rotating the shoulder in a circular fashion, keeping the humerus circumducting about the glenoid. The test is positive when pain or clicking is felt at the top of the motion when the patient's arm is by the ipsilateral ear. If both are positive, especially if they're positive right on top, around 12:00 to 2:00, I have considerable confidence in the diagnosis.

Dr. Dugas: Do you consider the circumduction/abduction test that Clancy describes as positive if it reproduces their pain, or do you have to detect some kind of mechanical clunk?

Dr. Crockett: Sometimes you can feel it moving, and they'll say, "Gee, that really hurts me right as you get up over the top." Almost always a supine SLAP test is then markedly positive. Then I'm almost positive, especially if they're having that deep pain that hurts them in overhand activities. The MRI has been positive on those occasions. But I've had some patients in whom I felt nothing up over the top even when they say, "Yes, you're killing me right there." Then I carefully note when it goes away. If it's gone by the 2:00 or 3:00 position, I'm suspicious, but I still do the other testing. If both are positive, I'll get an MRI.

Dr. Paletta: Let me ask you one other question just for my benefit. How does the posterior labral test that you're talking about differ from Hawkins' impingement signs? Is it the position of abduction of the arm?

Dr. Crockett: Yes. Where the Hawkins test is performed by forward flexion of the shoulder to 90° with the elbow flexed to 90° with sharp internal rotation, the supine SLAP test has forward flexion to 180° and is spinning forward onto the labrum directly under the acromion. In a young thrower we're not thinking very much of impingement, but I'll do the Hawkins test anyway, just to make sure. I'm much more suspicious of deep pain. In one test that Andrews describes, he puts one finger on the front of the shoulder and another on the back and asks the patient to imagine sticking those fingers through his skin and touching them together. He then asks if the pain is coming from where they would meet.

Dr. Timmerman: History is key. You can often pick up the diagnosis from the history if you ask the right questions and listen. Just two things to add. Especially in the teenagers, you'll miss a long

thoracic nerve palsy if you don't watch the scapula from the back and have them do a push-up. And you must do it every time or you'll forget, and you'll get burned. I've picked up a few of those. I also like that prone apprehension test. I usually do a lot of supine and prone testing if I'm trying to decide about laxity or significant instability. If there's no pain on the prone apprehension test, I feel better about the diagnosis.

Dr. Dugas: Could you describe that test?

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Dr. Timmerman: With patients in the prone position, move them to the edge of the table, abduct and externally rotate the arm, then lever on the arm to apply an anterior force. I find that test fairly useful.

We have another test that sounds like what you were describing. It's basically what I call "the elbow to the ear test." With the patient supine and the arm straight, I bring the elbow up and try to touch it to the ear. That one has been pretty good at picking up superior labral pathology, especially in gymnasts.

Dr. Dugas: Do you internally rotate them more once you get the elbow up to the ear?

Dr. Timmerman: I've never tried that. I'll have to add it.

Dr. Eaton: To examine the shoulder you must have the patient lie down. That accomplishes a couple of things. First, you get them to relax. Second, when they lie down, the scapula stabilizes, so you must test their long thoracic nerve separately. Once they are down and the scapula is stabilized, I repeat a lot of the tests that I did with them in the sitting position. I'll do the O'Brien's test and all of the impingement tests over to see whether there's any change. The relocation test of Dr. Frank Jobe is, of course, excellent for anterior instability. But the test I really like to do starts with the arm partially abducted and the patient relaxed. I start to move them around and do an axial compression right along the humerus to whether I can get that labrum to flip back and pull back down. I'll try to sublax them a little bit as I'm doing that to see whether I can catch the edge of the labrum, then bring them back down to see whether that reproduces their pain. I think that's very similar to what everyone else has described as a test. My special

approach to it is getting the patient to relax, holding that arm in my hand, and then applying pressure at the elbow as I'm moving it around. I like to do a little axial load to it as well when I'm moving it, because I think that gets a little edge in.

Dr. Paletta: It's interesting that everybody here has a particular idiosyncratic approach to the shoulder, whereas if you asked each of us how we examine the knee, it would be basically the same. It points out that there is no single widely accepted physical exam maneuver for the shoulder that everyone would agree upon.

Dr. Eaton: They're all similar, though; everybody is trying to pinch the labrum somehow.

Dr. Dugas: In a study that we did comparing O'Brien's test with the test that Steve Liu described, we found that none of them lived up to their billing in the literature. They're all highly sensitive tests, but I think the specificity is pretty poor for most of them. Certainly there's nothing as good as the Lachman test for the ACL.

Dr. Timmerman: Maybe it's simply that each examiner knows how he does it and knows what the MRIs and scopes look like. Then you compile the data in your own mind.

The History—Key Questions and Symptoms

Dr. Dugas: I'd like to return to the importance of the history. The time during throwing and the phase of throwing that causes the pain, a loss of velocity, a loss of control, pain the day after they throw, pain the day of the throw, one particular throw that hurt them—these all seem to be very important aspects of the thrower's history. Any neurovascular symptoms? Any numbness or discoloration of the fingertips? Certainly we've seen an increase in the number of vascular injuries in these throwers. All of those things play into the history. We glossed over them even as we were all saying that the history was extremely important. There are obviously some unique questions you have to ask the thrower that you wouldn't ask somebody else, velocity and control being two of the big ones. Certainly a decrease in performance would herald pathology in the shoulder.

Dr. Timmerman: The symptom I regard as key, if I had to pick one, is where in the throw it hurts. What part of the throw causes your pain?

Dr. Paletta: That's what helps me the most in the differential diagnosis.

Dr. Timmerman: I would like to add a comment for examiners who aren't very strong. When they're examining supine players, they can get a

much better external rotation strength test than when the player is sitting up.

Dr. Paletta: How many of you test their external rotation strength in the 90/90 position?

Dr. Timmerman: When you get them up to the 90/90 position to test them, do you pick up a little weakness?

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Dr. Paletta: Yes. I sure do, especially eccentric external rotation testing. I'm surprised at how many are weak at the 90/90 position, which is really their functional arc, as opposed to down at the side.

Dr. Timmerman: And down at their side they have pretty good strength?

Dr. Paletta: Yes!

Dr. Dugas: Do you think that external rotation weakness is a primary weakness? Or do you think there's any suprascapular nerve involvement, or are you perhaps impinging the nerve in that position? I agree with you that they would be weak in that position. Certainly some throwers tend to have less external rotation strength than other people do.

Dr. Paletta: I think it's a primary weakness; not an underlying subclinical neuropathy.

Dr. Dugas: George, are they weak compared with the other side?

Dr. Paletta: Yes—There's clearly a difference.

Dr. Dugas: To summarize, the throwing athlete presents a diagnostic challenge to the clinician. A thorough history, including the nature of the problem and the events that led up to the problem, must be documented. Age certainly plays a big role in the type of pathology expected in the throwing shoulder. The physical examination of the thrower's shoulder is complicated by the need for normal laxity. Distinguishing laxity from instability is of paramount importance. Tests for labral pathology as well as rotator cuff pathology, gross or subtle, are imperfect at best. Correlation with diagnostic imaging studies such as MRI may improve the diagnostic accuracy of the treating physician.

EARLY TREATMENT

Dr. Dugas: Let's move on to the initial management. You have a thrower with shoulder pain and you don't have an MRI yet. You've gone through your work-up and you're thinking that he may have some rotator cuff pathology. Where do you start?

Dr. Eaton: By asking: Who is the thrower? If it's a non-focal exam, you certainly want to start conservatively. Obviously you can use a thrower's program or just an overall strengthening program. For many young baseball pitchers— Division II baseball pitchers, some Division I players when they come down, and really a lot of high school kids—training programs are all they need. Young women who have never exercised seem to benefit the most when they are put on it prophylactically. Some of the young men who have lifted to unload the rotator cuff may not benefit quite as much. But many of the young women have the pain go away and are able to play softball and get through it pretty well. So we recommend that as initial treatment.

When to Use Imaging Studies

Dr. Dugas: Dr. Paletta, in your experience with professionals in whom you suspect internal impingement, are you going to get an MRI right away, or are you going to start them on some conservative treatment?

Dr. Paletta: The differentiating factor for me is a suspicion that they have a structural abnormality of the shoulder—for example, a SLAP tear or a significant labral tear. If I suspect that on the basis of the history and clinical exam, I'm going right to the imaging studies. If I don't suspect that and I think they've got cuff tendinitis or a tight posterior capsule with some vague posterior shoulder pain, I will not necessarily go straight to an MRI scan. I'll treat them nonsurgically. But if I suspect at all that they have a structural lesion in the shoulder, I don't wait.

Dr. Eaton: We had an interesting scenario last year. We signed four baseball pitchers, and we got MRIs on four baseball pitchers. Two of those baseball pitchers completed the season and had the best season of their lives. The other two wound up having surgery and did not complete the season. And the ones who had the worst MRIs did the best. The ones who had MRIs that showed no problem were the ones who didn't complete the season. This was pre-signing MRIs, and they were not contrast enhanced. It was simply a way to get an idea of what's going on inside the shoulder. My point is that imaging studies can provide only a small portion of the picture. You must differentiate beforehand between a mechanical lesion and a non-mechanical lesion. Pitchers who have 200-plus innings are not going to have a normal MRI. Once you get an MRI you might be opening Pandora's Box and painting yourself into a corner.

Dr. Paletta: I want to use the imaging studies to confirm my clinical diagnosis. I don't want to make a

clinical diagnosis based on the imaging studies, because so many of these athletes will have abnormalities on their MRI scan. All of a sudden you're looking at a labrum that doesn't look completely normal or a cuff that doesn't look completely normal. How do you explain those away? I base the decision to image in these cases on my clinical suspicion.

"I don't want to make a clinical diagnosis based on the imaging studies, because so many of these athletes will have abnormalities on their MRI scan."

Dr. Eaton: Absolutely. I agree with Dr. Paletta 100%. I really trust the opinion of our trainers, because they are the go-between and can let you know what's going on. They can guide you well, but once you get an MRI, you can wind up being painted into a corner. That is not helpful for the player.

Dr. Timmerman: In an everyday population of high school or even college kids, an MRI is when you're starting to think about doing surgery. But it's a lot different when you have professional teams and somebody is looking over your shoulder saying, "Why didn't you diagnose that 3 months ago when you knew he had it." That's a very different scenario. Then again, the MRI can be overread, so you might end up scoping the shoulder. I do listen to the trainers, because I think they have a lot of experience. When patients are not getting better with rest and you have a suspicion there's something there, I would get an MRI.

Another consideration: how to explain exercise to these kids, especially teenagers. We had these big, beefy guys in there saying, "Well, I do my weights, I do my exercises." I always tell them the little muscles need little weights, and the big muscles need big weights, because they're not doing a cuff program. They think that if they can bench press all this weight they're fine, but I explain that even the pro baseball players use 5-pound weights sometimes. And I try to get through to them the importance of doing a natural cuff program, especially high school students.

Dr. Dugas: I agree. To summarize what you all said: You take a different approach for different players. In the non-professional thrower, our approach would always be conservative treatment unless you really have hard evidence on clinical exam of a mechanical lesion. You'd start them on conservative treatment—rest, anti-inflammatory medications, some kind of a strengthening program—and then let them try to get back into throwing without doing an MRI or without doing anything more aggressive. But in more urgent cases—

such as the collegiate athlete who may have a scholarship riding on it, all the way through the major league level—there is increasing pressure to do an imaging study that will give you a back-up to what you're seeing on your clinical exam, with the caveat that you may get backed into a corner. That's the downside of almost being forced to get an MRI by the industry standard.

Psychological Considerations

Dr. Crockett: Having pitched myself in college, I know the tremendous pressure on the kids to advance and do well, especially in the minors. What Dr. Eaton says about opening Pandora's Box is true. What we didn't touch upon is the mental damage it can do: If you get an MRI and you think something is there, the kid thinks, "Man, my shoulder is shot; I'm not going to do well." It may never have been a problem; but if that athlete sits down, another player is going to take that spot. Keep in mind the psychological component of these issues, and it's worse the higher up you get.

Dr. Timmerman: The college kids approaching the draft don't want a lot of MRI reports in their file, either.

Dr. Dugas: Exactly. And we're seeing more and more kids skipping college in favor of an early draft. Certainly a lot of that is coming from the injuries and the long list of problems that people have in the minors. They don't have the same level of training attention that the major league professionals do. There are a lot of young athletes out there skipping college for the draft who are not bad students and could certainly get scholarships to play at good schools.

Use of Corticosteroids

Dr. Dugas: Does anybody have strong feelings on the role of corticosteroid injections in throwers?

Dr. Timmerman: If they obtain significant improvement from a one-time injection in the subacromial space, that can help you sort out rotator cuff tendinitis. I would probably not do it more than once. But I have done this injection occasionally at the end of the season to get these players over the hump.

Dr. Crockett: I've used it diagnostically, but not therapeutically. I don't have a lot of faith that it's going to get me through the long-term. I've probably done it twice in 2 years.

Dr. Paletta: I've used it a bit more, but selectively. When I use it I've already ruled out mechanical

and structural problems and decided that their underlying problem is an inflammatory one—cuff tendinitis, subacromial impingement, secondary or primary—and they have not responded to the usual oral nonsteroidal anti-inflammatories and the appropriate rehab and rest program. I'm not reluctant to use it, but I'm very selective in the diagnosis that I use it for.

Dr. Eaton: I use it. I'll use it after a work-up, though, to make sure that there are no underlying structural problems. I use it quite a bit, especially with the older players and with tendinitis.

Dr. Timmerman: Are you doing any intra-articular injections?

Dr. Eaton: I have not. It's mostly been impingement, but I've also done it for biceps tendinitis, coracoid impingements and for parascapular trigger points. Claude Moorman's study using hamstrings was a great study. It's very effective in soft tissue, and I've had good success in and around the shoulder and even the elbow. Sometimes it gets the athletes over the hump and gets them going. I will use dexamethasone 4 mg, and I may use it on more than one occasion within a 3-month period. But definitely no more. I do use a second injection if they're a lot better after the first. But very selectively.

Dr. Timmerman: And you have a slightly older population, also, with more impingement.

Dr. Dugas: How many use oral corticosteroids, dose packs, and the like? How has that worked?

Dr. Paletta: I do use it—I find it can be a very effective tool—but again, it's not my first-line treatment. Again, I often start with a nonsteroidal anti-inflammatory, but I've found that players respond generally pretty well to oral steroids. I've also found players that have come to us from other organizations where they use it even more liberally than we do.

Dr. Dugas: What do you use it for? Are you talking about throwing pain?

Dr. Paletta: I'm talking about conditions that, after an appropriate work-up, I'm fairly confident are inflammatory—not an underlying structural or mechanical problem—and that fail to respond to rest, rehab, and oral nonsteroidals. If it's an intra-articular problem like a synovitis, I'll use an oral dose pack before I'll do an intra-articular injection. If you don't treat the underlying inflammatory process, the baseball player is never going to get back in the same season. So I use oral steroids, not as a first-line defense, obviously, but I consider it a very reasonable approach.

Part II will appear in the June issue.

