

Treatment of Recalcitrant Iliopsoas Tendinitis in Athletes and Dancers with Corticosteroid Injection Under Fluoroscopy

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Abstract

Corticosteroid solution was injected under fluoroscopy into the iliopsoas sheath in young dancers and other athletes to combat chronic exercise-induced iliopsoas tendinitis which had proven unresponsive to more conservative treatments. Ten outcomes were graded as "excellent," three others as "good," two as "fair," and two were "poor." These results suggest that the treatment is a viable alternative to the more radical surgical release of the tendon. It is hypothesized, however, that its effectiveness may depend in large part on proper post-operative management, designed to avoid recurrence of the injury by correcting the alignment problems and errors in technique that initially precipitated the tendinitis.

Clicking and popping about the hip in athletes and dancers is a common phenomenon, and generally remains asymptomatic. In certain circumstances, however, especially where the hip is subjected to frequent and extreme hyperextension and external rotation, the same condition that produces these sounds (the "snapping" tendon) may also cause pain severe enough to

restrict or prohibit activity, and therefore requires medical attention. This painful snapping hip is most frequently encountered in dancers, gymnasts, and soccer players, who make very heavy demands upon the iliopsoas muscle-tendinous unit for both strength and endurance, and therefore are especially prone to hypertrophy of these structures, setting the stage for derangement of the iliopsoas mechanism at the anterior aspect of the hip.

Early reports of "snapping hip" treated the condition as a single entity involving movement of the tensor fascia lata or iliotibial band over the greater trochanter on the external aspect of the hip.¹⁻⁵ With Moreira⁶ and especially Nunziata,⁷ however, a distinction came to be made between this variety and an "internal" snapping hip experienced in the groin area on the anterior aspect of the hip. Initially some observers suggested that this medial snapping was due to a tear of the labrum, and in some instances surgical exploration of these hips was carried out.⁸ However, subsequent investigative studies, spearheaded by

Schaberg and colleagues,^{9,10} demonstrated that it results from the iliopsoas tendon snapping over the neck of the femur. This finding was subsequently replicated by several other investigators.¹¹⁻¹³

Internal snapping hip poses a greater problem for the population at risk than the external variety, as the pain associated with it tends to be more intense and therefore more debilitating. We were apparently the first to propose that this pain is the result of a stenosing tenosynovitis of the iliopsoas tendon near its insertion on the femur — essentially an iliopsoas tendinitis.¹⁴ Others implicate the iliopsoas bursa, which lies between the iliopsoas tendon and the anterior hip capsule.^{15,16}

In either case, whether the injury we are attempting to manage is strictly defined as a tendinitis or a bursitis, the preferred initial treatment involves: "relative" rest; the use of anti-inflammatory medication and therapeutic modalities such as deep heat or ultrasound; anti-lordotic exercises, and peripelvic stretching and strengthening exercises, particularly of the iliopsoas, both for immediate relief and to correct the biomechanical conditions that caused the problem in the first place. These "conservative" measures have generally been found to be quite efficacious.¹⁷⁻²³

The great majority of young athletes and dancers with this condition can be successfully treated with

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this conservative approach, particularly if the diagnosis is made early and intervention begun immediately thereafter. Unfortunately, many dancers and athletes, and their teachers and coaches, tend to dismiss snapping hip in its early stages as a minor mechanical problem. In other cases ineffectual treatment that simply approaches it as an inflammatory condition, without attempting to correct the excessive tightness and muscle imbalances about the hip, can result in persistence of this condition to the point where chronic inflammation of the tendon sheath and bursa occurs.

Successful surgical release of the contracted iliopsoas tendon was first described by Schaberg and associates¹⁰ in 1984. Subsequently, Jacobson²⁴ and Rotini²⁵ also reported successful treatment of internal snapping hip with surgical lengthening of the muscle-tendon unit. Our own experience with this procedure has also been favorable, but in recent years we have preferred a trial of up to three corticosteroid injections before proceeding to surgery. Initially we administered corticosteroid injections in an office setting using palpation and anatomic landmarks for guidance. We have subsequently found that the success rate of this intervention can be increased with fluoroscopy, using a dye infusion prior to injection of the steroid to insure the exact site of injection into the tendon sheath and associated bursa at the femoral head.

While corticosteroid injections for this condition have been suggested by a number of physicians,^{10,11,13,19,26} this is to the best of our knowledge the first published study of diagnostic criteria, treatment technique, and results.

Methods

Subject Base

From October, 1993 through December, 1995 we used corticosteroid injection to treat 17 cases of recalcitrant "snapping" iliopsoas tendinitis in 13 subjects (four cases were bilat-

eral). All were female, and they ranged in age from 15 years, 1 month to 23 years, 10 months (mean age: 17 years, 8 months). Nine were dancers, the others were very actively involved in athletics (gymnastics 2, soccer 1, cheer leading 1), and in every case the tendinitis clearly related to their sport of choice.

Data Collection

In June, 1995, a questionnaire was administered either in writing or by phone to each of the subjects. They were asked: 1. How much time had elapsed between the onset of symptoms and the injection; 2. How, on a scale of 1-10,^{27,28} they would rate the extent of their pain (a) before the procedure, (b) immediately thereafter, (c) two weeks later, (d) two months later, and (e) "now" (i.e., at the time of filling out the questionnaire). They were also asked for their subjective rating, again on a scale of 1-10, of how effective the procedure had been, and to describe any remaining symptoms. Their observations were then compared with our clinical notes recorded at follow-up examinations. By comparing these two sets of impressions we were able to categorize the results of each procedure as "Excellent," "Good," "Fair," or "Poor." These terms were defined respectively as indicating that the patient: had returned to full pre-operative activity with an improved pain scale rating, post-operative to pre-operative, of at least 5 points; had returned to an acceptable level of activity with pain scale differential of 3 to 4 points; was functioning at a significantly impaired level with 2 to 3 point differential; was unable to participate in the desired activity because of excessive pain. Note was also taken of the elapsed time between the injection and the assessment of its efficacy.

Diagnosis

In most cases the diagnosis of iliopsoas tendinitis can be strongly suspected from the history provided by the dancer or athlete. Dancers will

often describe a slow progressive onset of an initially painless snap that occurs in performing the maneuver of *développé* to the side. In particular, this snap occurs as the leg is brought down from the elevated, abducted, and externally rotated position of the hip and aligned with the standing leg. Subsequently there is pain accompanying the snap, and this pain progresses to the point where dancing must be discontinued.

In addition to this characteristic history we have found three simple diagnostic tests useful to confirm the presence of iliopsoas tendinitis. The first is a provocative hyperflexion test. With the patient supine upon the examination table and the hip in neutral rotation and neutral abduction, the hip is slowly, progressively, and passively flexed by the examiner (Fig. 1). In all of the cases of iliopsoas tendinitis we have encountered this results in pain, while the same test on the uninvolved hip is painless. In the second test the knee is placed in a "frog" position. The patient is then asked to flex and adduct the extremity against the hand of the examiner placed at the knee (Fig. 2). This maneuver elicits pain when tendinitis is present. In the third test the limb is placed in a position of hyperextension and abduction with the leg hanging over the side of the examining table and the knee flexed at 90° (Fig. 3). The hip is then slowly, provocatively rotated internally, which again appears to put stress upon the iliopsoas unit and the associated bursa and results in pain.

Surgical Procedure

The patient is brought into the operating room under sedation and placed supine on the operating table with the appropriate hip abducted, flexed, and externally rotated in the "frog" position. The thigh and hip area are prepped and draped in a sterile fashion, and approximately 3 ml of 1% Xylocaine is injected at the pubic ramus immediately inferior to the adductor longus. A spinal needle is then introduced me-



Figure 1 Provocative hyperflexion test: the hip is slowly, progressively, and passively flexed by the examiner.



Figure 2 "Frog" position test: the patient flexes and adducts the extremity against the examiner's resistance.



Figure 3 With the leg hanging over the table the hip is slowly, provocatively rotated internally.



Figure 4 Fluoroscopic image of the spinal needle inserted into the iliopsoas tendon sheath (as defined by radiopaque dye).

dially and directed anterior to the head of the femur and deep to the neurovascular bundle. With experience we have learned that we must inject specifically into the iliopsoas tendon sheath itself, so we use fluoroscopy for guidance (Fig. 4). A small amount of radiopaque dye is injected through the spinal needle to insure that it is in the sheath and not the joint (if the needle is found initially to be in the hip joint, as with an anterior arthrogram, by withdrawing and rotating it a bit another injection of dye will outline the sheath down to the lesser trochanter). Two to 4 ml of Celestone are then injected. It is our impression that this not only permeates the sheath, but in most cases also communicates with the overlying bursa.

The needle is then withdrawn, the prep solution cleaned off, and a dressing applied over the site.

Results

Of the 17 cases treated, ten outcomes were judged to be excellent as defined above (one of these patients required a second injection to achieve the desired result), three others produced good results (one after a second injection), two were fair, and two were poor (after two corticosteroid injections one of these patients proceeded to a surgical release of the tendon sheath, which gave an excellent result). These assessments were based on an average follow-up of 13 months (range: 3 to 30 months) from the date of the injection to the date of the latest evaluation.

When the 17 cases are considered collectively a clear pattern is discernible in the two to three month period following the procedure. Virtually all of the patients complained of pain (or "soreness") immediately thereafter, but attributed this to the injection itself rather than to the condition in their hip. At two weeks 15 patients were essentially asymptomatic. By two months one patient that had not previously responded to treatment was free of symptoms, but another that was initially asymptomatic exhibited recurrent popping and pain. In one case there was no appreciable change during this period. If the results of this study were calculated two-three months after the procedure, using the same criteria as above, 12 out-

comes would be judged excellent, three good, and two would be poor.

It should be noted that a few of those patients who returned to "full" or "acceptable" levels of activity reported intermittent pain. Overall, the 13 subjects estimated the severity of their post-operative pain "on a daily basis," using the 1-10 scale, at an average of 1.4. "At its worst" the pain averaged 4.4. Nonetheless, this represents significant improvement over the comparable pre-injection levels of 6.1 and 9.1 respectively.

On average the subjects rated the corticosteroid injections effective at the 7.3 level on the 1-10 scale.

No patients experienced complications from this procedure.

Discussion

In its early stages medial snapping hip is usually painless, and therefore seemingly benign. It is only with repetition over time that the tendon becomes irritated and inflamed enough to stick in its sheath and sustain the tearing and scarring that characterize tendinitis. This no doubt explains in part why many dance teachers advise that snapping hip is really nothing to worry about unless it is painful. Such advice may also mask an ignorance of how to correct dance technique to eliminate the snapping. At any rate, it is widely known that dancers are prone to snapping hip, and one might well wonder why *more* of them do not progress to iliopsoas tendinitis.

Our theory is that when many dancers say their hips snap/click/pop they mean *occasionally*; that this is something they have experienced and taught themselves to avoid by subtly altering their technique when performing hip abducting movements (many dancers can intentionally snap their hips; hence, it is to some extent a controllable phenomenon). The unfortunate few who present to physicians only after the condition progresses to iliopsoas tendinitis are those who have taken too much to heart the ill-informed

injunction not to worry about the snapping until there is pain.

What we do when we inject the painful hip with corticosteroids is, of course, reduce the inflammation, thereby restoring the excursion of the tendon in its sheath and relieving the bursal impingement. From our findings with regard to the pattern of response in the weeks and months immediately following the procedure we hypothesize that this provides the opportunity, albeit perhaps a brief one, for the dancer to learn to work in a less injurious manner. The dancer who simply continues the practices that have initiated the injury runs a high risk of recurrence. With careful management the risk can be dramatically reduced.

As mentioned above, the basic components of initial management are therapeutic exercises to increase flexibility of the iliopsoas as well as the hip external rotators, and strengthening exercises for the external rotators, adductors, and internal rotators. This should be combined with anti-lordotic exercises, since a tightened iliopsoas muscle, which takes its origin from the anterior aspect of the lumbar spine, is inevitably associated with hyperlordosis. To this we would add that the emphasis in devising such a program and explaining it to the patient should be on correcting the dancer's technique and alignment to take the strain off the iliopsoas tendon and prevent its impingement on the femoral neck. Whenever possible this instruction should be supervised by someone trained in detecting such alignment problems as excessive pelvic extension ("hanging on the front of the hip"), and involve the patient's ballet teacher(s).

In young dancers who do not respond to this conservative management and continue to have a painful and debilitating medial snapping hip, injection of corticosteroid into the iliopsoas tendon sheath and bursa under fluoroscopic control has proven to be a beneficial intervention. In many cases this mode of treatment

can provide lasting relief of the condition, and avoid the need for more radical surgery.

Conclusion

This study suggests that, when performed in the surgical setting under fluoroscopy, corticosteroid injection into the iliopsoas sheath can in most cases greatly reduce the inflammation and pain associated with iliopsoas tendinitis. Post-injection care should be concentrated on correcting the errors in technique and alignment problems that caused the snapping that in turn caused the tendinitis. As some low level of irritation in the tendon is usually still present during the first few weeks or months following the injection, this period of time is probably crucial for affecting the desired changes.

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