

Posterolateral Rotatory Apprehension Test in Tennis Elbow

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Background: Tennis elbow is a syndrome that commonly diagnosed in patient who comes with lateral elbow pain. Instability pain in tennis elbow patient was observed and reported in many previous literatures. Posterolateral rotatory apprehension test was proposed for diagnosis of posterolateral rotatory instability of elbow. However, no review literatures that studied about posterolateral rotatory apprehensions test in tennis elbow.

Objective: To find out the relationship between posterolateral rotatory apprehension test and tennis elbow.

Material and Method: There were 44 patients that were recruited in this study. We examined the posterolateral rotatory apprehension test in tennis elbow patients. The examination was done in our outpatient clinic from March 2012 to April 2012. The data was collected to find out the ratio of negative test in tennis elbow patient.

Results: The results from the posterolateral rotatory apprehension test were negative in 43 patients. The ratio of the negative test result was 98%.

Conclusion: A result from posterolateral rotatory apprehension test should be negative in general tennis elbow patients. If this test is used in a tennis elbow patients who are suspected with hidden instability and the result is positive, further evaluation is strongly suggested.

Keywords: Tennis elbow, Posterolateral rotatory apprehension test, Relationship, Instability

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Tennis elbow is a syndrome that commonly diagnosed in patient who comes with lateral elbow pain. The diagnosis of tennis elbow is made by history of lateral elbow pain with ruling out other obvious causes of pain such as history of trauma, evident of nerve lesion, or mal-alignment, and on physical examination of tenderness at lateral epicondyle and positive Cozen's test⁽¹⁾.

In tennis elbow or lateral epicondylitis, the exact pathology is still inconclusive^(2,3). But the most accepted pathology stays within extensor carpi radialis brevis (ECRB) origin⁽⁴⁾ and the source of pain is likely produces from non-functioning ECRB. Maneuver that causes ECRB exertion or stretch as Cozen's test or long finger extension test produces the symptom⁽¹⁾.

Instability pain in tennis elbow patient was observed and reported in many previous literatures⁽⁵⁻⁸⁾. In this group of patients, the ligament

reconstruction is one way to help them⁽⁶⁻⁸⁾. There are many theories that explain causes of instability pain in tennis elbow patient which is still inconclusive and is an interesting topic.

Examination of elbow instability was proposed by many methods. O'Driscoll proposed the posterolateral rotatory apprehension test for diagnosis of posterolateral rotatory instability of elbow⁽¹⁰⁾. It showed good sensitivity results in diagnosing posterolateral instability without adding any invasive procedure such as general anesthesia⁽¹¹⁾.

To study complicate issue in tennis elbow patients such as the hidden instability pain, we decided to choose posterolateral rotatory apprehension test due to the advantage of noninvasive simplified maneuver and has a reliable result in detecting instability pain. To our knowledge, we have not found any English language literatures that studied about posterolateral rotatory apprehensions tests in tennis elbow. So we conducted the study to find out the relationship between posterolateral rotatory apprehension test and tennis elbow patient. Our hypothesis is that posterolateral rotatory apprehension test should not be positive in tennis elbow patients.

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Material and Method

From March to April 2012, the patient who presented with lateral elbow pain, examination showed the tender at lateral epicondyle, positive for Cozen's test and ruling out other obvious causes of pain such as history of trauma, evident of nerve lesion, loss of range of motion or mal-alignment from our orthopedic outpatient clinic were diagnosed tennis elbow. All of them were diagnosed by orthopedist and were recruited in this study. All patients were given informed consent and this study was approved by our faculty's IRB.

The exclusion criteria were patient's history of steroid injection, chronic symptoms for more than 6 months, cubitus varus alignment, history of elbow injury or dislocation, history of elbow surgery and high risk for chronic lateral collateral ligament (LCL) strain (wheelchair use, chronic crutch use).

The posterolateral rotatory (PLR) apprehension test in this study was done only by senior orthopedic resident (TP) who was responsible in this study and learned this test with an experience elbow surgeon (CC). The PLR apprehension test was described in O'Driscoll study⁽¹⁰⁾. In shortly description, the patient was in supine position, examiner stayed cephalic to the patient. The shoulder was in the overhead position so the examiner can hold the forearm in full supination with elbow extension position. Then the examiner applied axial force, so that the elbow would move from extension to flexion position. Apprehension pain or feeling of instability that was produced meant positive test.

Statistical analysis

The sample size was calculated from standard equation and the number is 42.6. After excluding the patients, 44 participants were participated in this study. The result of negative test was calculated for finding out the ratio by SPSS version 19 (IBM, New York).

Results

There were 44 patients with 20 males and 24 females that were recruited in this study. The symptom was occurred in 25 dominant hand and 19 non-dominant hand. The mean age was 46.9 (32-70) years old. The duration of symptoms was 4.6 (1-6) months (Table 1). The results from the posterolateral rotatory apprehension test were positive in 1 patient and negative in 43 patients (Table 2 and Fig. 1). After calculating the ratio of the negative test result was 98%.

We further examined the patient until 6 months

Table 1. Patients demographic data

Topic	Number
Patients	44
Gender	
Male	20
Female	24
Mean age (years)	46.9 (32-70)
Mean duration (months)	4.6 (1-6)
Dominant hand	25
Non-dominant hand	19

Table 2. Results of the posterolateral rotatory apprehension test

Posterolateral rotatory apprehension test	Cases
Positive	1
Negative	43

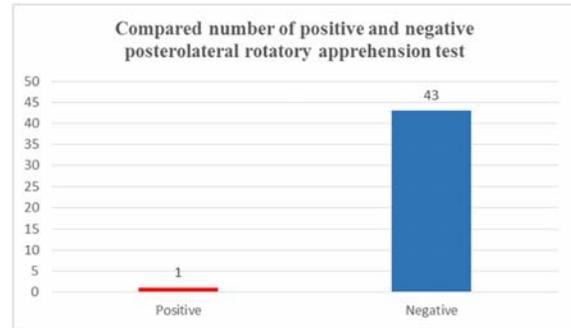


Fig. 1 Positive and negative posterolateral rotatory apprehension test.

after the diagnosis and there was one person who had lost follow-up. In this population, there was no patient that needed to go for surgery. All patient recovered successfully by conservative treatment with oral medication, physiotherapy and two patients needed to be treated with one time steroid injection.

Discussion

PLR apprehension test contains steps that requires force in order to twist and move the elbow. This maneuver we concern with motion or twisting of ECRB that can possibly cause the elbow pain. In this situation, the false positive can be interpreted that these tennis elbow patients have no hidden instability.

Instability pain hidden in tennis elbow patients has recently been mentioned⁽⁵⁻⁸⁾. Many issues are still controversy such as the cause of instability, the miss concept in the diagnosis, the best tool to evaluate this instability and even the true incident of instability in tennis elbow patients which had never been studied.

From our results, we found that 98% of the patients had a negative posterolateral rotatory apprehension test. Only one patient had a positive result, and he lost follow-up. The positive result can be from false positive or maybe he really had hidden instability pain. Unfortunately, we did not find the cause of positive test in this patient. For other patients, the symptom got better in the following-up period with conservative treatment.

Limitation of this study is that the study result helps us only in predicting the trend of the relationship between tennis elbow patient and apprehension test. The result explains only in one-way association, and there is no causal relationship. But with the limitation there is a movement such as PLRI instability test can be used as a maneuver in further study without concerning about false positive. Further study need to be conducted to find out the causes that correlate with positive instability test in tennis elbow patients, which helps us to see more clearly about the instability pain in tennis elbow patients issue.

Conclusion

In general tennis elbow patient, a posterolateral rotatory apprehension test result should be negative. From the strong negative results of this test in our study, if the posterolateral rotatory apprehension test is used in a tennis elbow patients who are suspected with hidden instability and the result is positive, further evaluation is strongly suggested.

What is already known on this topic ?

Instability pain present as chronic tennis elbow is existed. In the previous literatures the examination or clinical sign that specific for diagnosed this situation were lacking. Posterolateral rotatory apprehension test is a common examination and have a good sensitivity for traumatic instability condition. In our knowledge, no review literatures show the result of this examination, not a false positive, in general tennis elbow patients.

What this study adds ?

In the practice, we concerned the instability

pain in tennis elbow patients. Posterolateral rotatory apprehension test positive is a reliable indicator for a further investigation in the instability condition without to concern that is a false positive result.

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Potential conflicts of interest

None.

References

1. Miller RH 3rd, Frederick MA, Thomas WT. Shoulder and elbow injuries. In: Canale ST, Beatty JH, editors. Campbell's operative orthopaedics. 12th ed. Philadelphia: Elsevier; 2013: 2241-2.
2. Ahmad Z, Siddiqui N, Malik SS, Abdus-Samee M, Tytherleigh-Strong G, Rushton N. Lateral epicondylitis: a review of pathology and management. *Bone Joint J* 2013; 95-B: 1158-64.
3. Titchener AG, Fakis A, Tambe AA, Smith C, Hubbard RB, Clark DI. Risk factors in lateral epicondylitis (tennis elbow): a case-control study. *J Hand Surg Eur Vol* 2013; 38: 159-64.
4. Calfee RP, Patel A, DaSilva MF, Akelman E. Management of lateral epicondylitis: current concepts. *J Am Acad Orthop Surg* 2008; 16: 19-29.
5. Charalambous CP, Stanley JK. Posterolateral rotatory instability of the elbow. *J Bone Joint Surg Br* 2008; 90: 272-9.
6. Kalainov DM, Cohen MS. Posterolateral rotatory instability of the elbow in association with lateral epicondylitis. A report of three cases. *J Bone Joint Surg Am* 2005; 87: 1120-5.
7. Chanlalit C, Limsricharoen W. Posterolateral rotatory instability from multiple steroids injections for tennis elbow: a case report. *J Med Assoc Thai* 2013; 96 (Suppl 1): S104-7.
8. Yang C, Li W, Gong YB, Li SQ, Qi X. Posterolateral rotatory instability of the elbow: a case report and literature review. *Chin J Traumatol* 2010; 13: 380-2.
9. Savoie FH 3rd, Field LD, Gurley DJ. Arthroscopic and open radial ulnohumeral ligament reconstruction for posterolateral rotatory instability of the elbow. *Hand Clin* 2009; 25: 323-9.
10. O'Driscoll SW, Bell DF, Morrey BF. Posterolateral rotatory instability of the elbow. *J Bone Joint Surg Am* 1991; 73: 440-6.

11. O'Driscoll SW. Classification and evaluation of recurrent instability of the elbow. Clin Orthop Relat

Res 2000; 34-43.

ความสัมพันธ์ของการตรวจ posterolateral rotatory apprehension test ในผู้ป่วย tennis elbow

ชลวิษ จันทรลลิต, เต็มพงศ์ พอค้า

ภูมิหลัง: Tennis elbow เป็นกลุ่มอาการที่มักจะได้รับการวินิจฉัยในผู้ป่วยที่มาด้วยอาการปวดข้อศอกด้านนอก ภาวะความไม่มั่นคงแฝงในผู้ป่วย tennis elbow กำลังเป็นที่กล่าวถึงและเป็นจุดที่สนใจในงานวิจัยก่อนหน้าการตรวจ posterolateral rotatory apprehension test (PLR test) สามารถใช้ในการประเมินภาวะข้อศอกไม่มั่นคงได้ ซึ่งยังไม่พบงานวิจัยที่ศึกษาเกี่ยวกับเรื่อง posterolateral rotatory apprehension test ในผู้ป่วย tennis elbow มาก่อน

วัตถุประสงค์: เพื่อหาความสัมพันธ์ระหว่าง posterolateral rotatory apprehension test กับผู้ป่วย tennis elbow

วัสดุและวิธีการ: ได้ผู้ป่วยเข้ารวมการวิจัยทั้งหมด 44 ราย ทำการตรวจ posterolateral rotatory apprehension test ในผู้ป่วยที่มาตรวจที่ห้องตรวจผู้ป่วยนอกและได้รับการวินิจฉัย tennis elbow ระหว่างเดือนมีนาคม ถึง เดือนเมษายน พ.ศ. 2556 จากนั้นนำข้อมูลที่ได้มาคำนวณหาอัตราของการตรวจไม่พบ posterolateral rotatory apprehension test ในผู้ป่วย tennis elbow

ผลการศึกษา: ผลการตรวจ posterolateral rotatory apprehension test คือ ตรวจไม่พบ posterolateral rotatory apprehension test ในผู้ป่วย 43 ราย คิดเป็น 98%

สรุป: ในผู้ป่วย tennis elbow ทั่วไปมักจะตรวจไม่พบ posterolateral rotatory apprehension test แต่ถ้าหากตรวจพบ posterolateral rotatory apprehension test ในผู้ป่วย tennis elbow ที่สงสัยว่าจะมีการไม่มั่นคงของข้อศอกแฝงอยู่ควรจะต้องทำการตรวจวินิจฉัยเพิ่มเติม
