Snapping ulnar nerve at the elbow: A case report and review of the literature

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Abstract
Case: A 15-year-old girl presented with complaints of pain and feeling of a snapping on the medial side of her left elbow. No pathology was detected on X-ray, Magnetic Resonance Imaging, and nerve conduction evaluations. Then, the dynamic Ultrasound showed that the ulnar nerve has snapped. We performed surgery to treat the ulnar nerve that was transposed under the fascia of the muscle. The medial head of the triceps muscle was elevated and moved laterally. All of her symptoms were resolved.

A snapping ulnar nerve is often associated with a snapping triceps. Accurate diagnosis is critical because misdiagnosis has been demonstrated to have serious consequences, including the need for repeat surgery.

Keywords
Snapping Ulna; Snapping Elbow; Cubital Tunnel; Triceps Syndrome; Transposition

DOI: 10.4328/ACAM.20155   Received: 2020-03-09   Accepted: 2020-04-15   Published Online: 2020-04-18   Printed: 2020-09-01   Ann Clin Anal Med 2020;11(5):536-539   Corresponding Author: Recep Dinçer, Department of Orthopedics and Traumatology, Suleyman Demirel University Faculty of Medicine, Isparta, 32000, Turkey
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Introduction
Isolated ulnar nerve instability is not common. The sensation of snapping around the elbow is not only related to the instability of the ulnar nerve but may also be because of the snapping of the medial head of the triceps muscle over the medial epicondyle. This may be accompanied by symptoms of the ulnar nerve. It is named ‘Snapping Triceps Syndrome,’ which occurs when the triceps is subluxated or dislocated on the medial epicondyle [1]. Because of recurring events in the ulnar nerve, instability during elbow flexion and extension is felt like a snap. Repeated trauma leads to ulnar neuritis. We treated the patient who had complaints of elbow sensation of snapping for two years. The patient was informed that data concerning the case would be submitted for publication, and she provided consent.

Case Report
A 15-year-old girl, a student, presented with complaints of pain and a snapping feeling on the medial side of the left elbow. She has been symptomatic for two years; her symptoms mainly consisted of inconvenience and intense pain around the medial humeral epicondyle during daily routine flexion and extension. During the last four months, symptoms had become worse. On careful physical examination, the snapping of the ulnar nerve over the medial epicondyle at 70° of flexion was suspected (Figures1, 2). Ulnar nerve function was intact, with no irritability and no abnormality on the neurophysiologic investigation. Tenderness over the medial humeral epicondyle was noted, and a possible diagnosis of medial epicondylitis was considered, but the picture was not typical. Investigations, including plain X-rays, Magnetic Resonance Imaging (MRI), and nerve conduction studies were normal. Then, the dynamic ultrasound (D-USG) showed that the ulnar nerve has snapped.

The treatment offered was conservative (bracing and nonsteroidal anti-inflammatory drugs [NSAIDs]) for three weeks. Informed consent was taken from her parents. Three weeks later, her exam was repeated, but her complaints did not regress, and surgery was performed. Intraoperatively, her ulnar nerve was observed to be dislocated and accompanied by the medial head of the triceps. There was no hypoplasia or other bone deformities at the medial epicondyle. The ulnar nerve was transposed proximally and distally. The ulnar nerve was transposed from its natural location posterior to the medial epicondyle to an anterior site, under the fascia of the flexor carpi ulnaris (FCU) muscle. The medial head of the triceps muscle was elevated and moved laterally. The intraoperative examination revealed that the pathology disappeared (Figure 3). An upper elbow brace was used for three weeks that kept the elbow at 90° of flexion, and a rehabilitation program lasted for six more weeks. There were no postoperative complications, and the patient had no symptom for one year.

Discussion
Recurrent ulnar nerve dislocation is not a common problem. Dislocation usually occurs in the dominant extremity. Its etiology is independent of a certain age, cause, and profession [2]. Considering the etiology of snapping ulnar syndrome, triceps muscle hypertrophy, laxity in congenital stabilizer ligaments, posttraumatic medial epicondyle bone anomaly and hypoplasia may be present. Anatomic variations of muscle have also been reported in cases accompanied by snapping of the triceps muscle [2-4].

When our patient was examined, the ulnar nerve was subluxated or dislocated on the medial epicondyle with flexion of the elbow of 70° and above, and returns to normal upon elbow extension. The sensation of snapping on the medial elbow is not only related to the ulnar nerve. Coexistence of the snapping of the medial head of the triceps muscle frequently may occur and should be vigilant on examination [2,3]. Symptoms are not only because of the dislocation of the ulnar nerve but may
Table 1. Reports of snapping ulnar nerve in the literature (Demographics, history, exam, diagnostic procedure, treatment, outcome)

<table>
<thead>
<tr>
<th>Year</th>
<th>Case Numbers</th>
<th>Accompanying pathology</th>
<th>Age/Sex/</th>
<th>Job</th>
<th>History</th>
<th>Examination</th>
<th>Diagnostic procedure</th>
<th>Conservative treatment</th>
<th>Surgical Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>One</td>
<td>Snapping triceps, ulnar neuritis</td>
<td>21/M/Carpenter</td>
<td>NR</td>
<td>NR</td>
<td>Snapping structure+</td>
<td>Clinical exam</td>
<td>NR</td>
<td>AT</td>
<td>Snapping sensation persisted and resolved</td>
</tr>
<tr>
<td>1995</td>
<td>One</td>
<td>Snapping triceps</td>
<td>45/M/ Welder</td>
<td>6 m</td>
<td>NR</td>
<td>Snapping structure+</td>
<td>On exam</td>
<td>Ultrasonography</td>
<td>ASCT</td>
<td>After 4 m persisted and resolved</td>
</tr>
<tr>
<td>2001</td>
<td>Three</td>
<td>1,2,3) Snapping triceps, ulnar neuritis</td>
<td>52/F/NR</td>
<td>34/F/NR</td>
<td>31/F/NR</td>
<td>1/2) NR</td>
<td>3) NR</td>
<td>1,2,3) Snapping structure+</td>
<td>1,2,3) Dynamic USG +</td>
<td>1,2,3) NR</td>
</tr>
<tr>
<td>2007</td>
<td>Three</td>
<td>1,2) Isolated 3) Cubital tunnel syndrome</td>
<td>33/M</td>
<td>Body builder</td>
<td>28/F/Waitress</td>
<td>35/F/Secretary</td>
<td>1,5 y</td>
<td>1 y</td>
<td>NR</td>
<td>1,2,3) Snapping structure+</td>
</tr>
<tr>
<td>2009</td>
<td>Three</td>
<td>1,2,3) Snapping triceps</td>
<td>35/M/Engineer</td>
<td>30/M/Manager</td>
<td>12/M/Rugby player</td>
<td>NR</td>
<td>9 y</td>
<td>12 m</td>
<td>1,3) Snapping structure+</td>
<td>1,3) X-ray N USG N EMG N</td>
</tr>
<tr>
<td>2012</td>
<td>One</td>
<td>Isolated 17/M/De-cathlete</td>
<td>3 y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X-ray N USG N EMG N</td>
</tr>
<tr>
<td>2012</td>
<td>One</td>
<td>Snapping triceps</td>
<td>35/M/Labaster</td>
<td>6 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X-ray: N USG: N Dynamic USG: +</td>
</tr>
<tr>
<td>2012</td>
<td>One</td>
<td>Isolated 17/M/Elite wrestler</td>
<td></td>
<td>1 w after trauma</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dynamic USG: +</td>
</tr>
<tr>
<td>2014</td>
<td>One</td>
<td>Snapping triceps</td>
<td>28/NR/Tennis player</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X-ray: N USG: N MRI: enlarged ulnar nerve Dynamic USG: +</td>
</tr>
<tr>
<td>2015</td>
<td>Three</td>
<td>1,3) Snapping triceps, Snapping medial antebrachial cutaneous nerve (MACN) 2) MACN</td>
<td>9/M/student</td>
<td>32/F/NR</td>
<td>17/F/Softball catcher</td>
<td>15 m</td>
<td>36 m</td>
<td>36 m</td>
<td>1) Snapping structure+</td>
<td>1) X-ray: N USG: N EMG: Not Reported(NR) 2) X-ray: N USG: N EMG: N MRI: N Physical exam: +</td>
</tr>
<tr>
<td>2016</td>
<td>One</td>
<td>Cubitus varus</td>
<td>12/F/NR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Snapping structure+</td>
</tr>
<tr>
<td>2016</td>
<td>One</td>
<td>Snapping triceps</td>
<td>32/M/NR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Static USG Negative Dynamic USG: +</td>
</tr>
</tbody>
</table>

Overall: N = 35 case

NR: Not reported, AT: anterior transposition, ASCT: Anterior subcutaneous transposition, ASMT: Anterior submuscular transposition
Annals of Clinical and Analytical Medicine

Snapping ulnar nerve

Since a snapping ulnar nerve is frequently associated with a selection of imaging modalities. We think that the primary diagnosis method is D-USG. Surgical treatment is the final method for both definitive diagnosis and definitive treatment. Since a snapping ulnar nerve is frequently associated with a snapping triceps, both should be intervened during surgery. Otherwise, repeated surgeries may be required.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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How to cite this article: