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The Surgical Treatment of Bilateral Accessory Extensor Carpi Ulnaris: Case Report and Literature Review

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Abstract

Several abnormal pathologies, such as inflammation or degenerative change, can be causes of ulnar-sided wrist pain. This study demonstrated bilateral accessory extensor carpi ulnaris found in a patient who presented with bilateral wrist pain. The patient was initially treated with all conventional methods but failed to improve. Following the operation by releasing the sixth extensor compartment, the pain was completely relieved. The Disabilities of the Arm, Shoulder, and Hand (DASH) score was remarkably improved and there was no limitation in daily living activities compared with preoperative status. We presented an uncommon condition of ulnar-sided wrist pain caused by bilateral accessory extensor carpi ulnaris which was successfully treated by releasing the extensor compartmental sheath without tendon resection.

Keywords

- accessory extensor carpi ulnaris
- accessory tendon
- wrist pain
- extensor compartment release

Accessory tendon or muscle has been reported in several parts of the upper extremity. The accessory slip of extensor carpi ulnaris (ECU) was identified arising from the normal ECU in the sixth extensor compartment with variation of incidence from different cadaveric study, from 5.6 to 34.2%.[1–3] The variation of ECU tendinous slips was classified according to the different insertion site on the fifth metacarpal bone.[3] However, there were a few reports in clinical context with the result for surgical intervention.

Clinical presentation of ulna-sided wrist pain could be caused by different pathologies. The causes of pain from ECU tendon lesions are found commonly from tenosynovitis, torn, or instability as subluxation or dislocation of the tendon. The accessory ECU was also found to be another source of dorsoulnar-sided wrist pain which was resolved after resection of the slip according to previous studies.[4–6] This report represents another unusual case of accessory ECU found bilaterally and the clinical outcomes following surgical treatment.

Case Report

A 54-year-old female patient visited the outpatient clinic with bilateral wrist pain at the dorsoulnar side for 6 months. The pain was triggered by almost every activity of her daily living, from driving car to just putting her clothes on. On examination, her wrists were not shown any sign of inflammation but tenderness on direct palpation at ECU tendon and when the patient flexed or rotated her wrists. The range of motion of both wrists was normal. The ice cream scoop test did not show any subluxation or dislocation of the tendon but pain. Synergy test was positive for both sides. The muscle power of wrist and fingers was grade V for all and sensation was intact. There was no history of wrist injury or palpable mass. She was given conservative regimens of immobilization, medication, and physical therapies for 6 months, including one-time steroid injection for each side due to the suspect of tenosynovitis cause but the pain did not resolve. Plain radiographs were taken and showed no abnormal findings (►**Fig. 1A–D**). Due to prolonged

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Fig. 1 (**A, B**) Plain film of right wrist in anteroposterior (AP) and lateral view, (**C, D**) plain film of left wrist in AP and lateral view. All demonstrated no abnormal findings.

pain and clinical suspicion on ECU tendon anomaly, surgical exploration was suggested for the patient.

The patient underwent surgical treatment by releasing the sheath of the sixth extensor compartment under local anesthesia, wide awake technique. Her right wrist was operated first due to worse clinical presentation. At operation, skin incision was made longitudinally at dorsoulnar side of the wrist approximately 1 to 2 cm in length. The osteofibrous sheath was also cut longitudinally releasing the ECU tendon from the compartment. The accessory slip was found situated lateral to the main ECU (►**Fig. 2**). Both tendons were examined and found no signs of inflammation or degeneration. The stability of tendon was examined by passively rotating patient's wrist and showed no subluxation or dislocation. The accessory slip was not resected. Incision was closed and a volar short-arm slab was applied for 2 weeks postoperatively. The patient underwent the same procedure for left wrist after the prior operation for 3 months (►**Fig. 3**). Following the treatment, the patient's symptom was significantly improved.

At 3 years postoperatively, the patient was able to do all activities by herself without pain exhibited such as driving, gardening, housework, or opening a bottle cap. She could move her wrists in full range and no clicking or crepitation on motion. The motor power of wrist and finger extension was grade V. The ice cream scoop test did not show any pain or signs of tendon subluxation bilaterally. The grip strength of left and right hand was 16 and 20 kg, respectively. The visual analog scale of both wrists was improved following operative treatment from 10 to be 0 out of 10 for both sides. The Disabilities of the Arm, Shoulder and Hand (DASH) score of pre- and postoperative periods was 67.24 and 0, respectively. The DASH score was same for both left and right wrists.

Discussion

In this study, the patient's symptoms were not resolved by nonoperative treatments then the operation was performed for both wrists. After the sixth compartment was released using longitudinally cut, accessory ECU slips were identified

Fig. 2 The accessory extensor carpi ulnaris slip was identified at the right wrist.

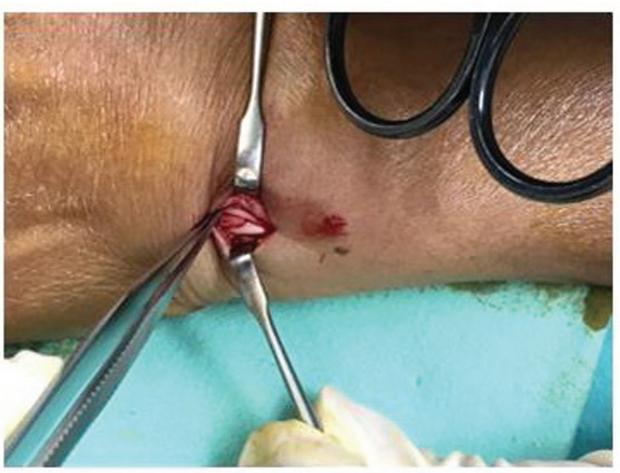

Fig. 3 The accessory extensor carpi ulnaris slip was identified at the left wrist.

in both wrists but were not resected. The ECU stability was tested and found no subluxation in all wrist motions; therefore, the sixth compartment was left open. The remained stability of the tendon could be from linea jugata, the fibers inserted inside the sixth compartment which reinforced the retinaculum and stabilized the tendon.[7] Following the operation, the patient's symptoms were remarkably improved and she was able to return to her previous functional status completely. Additionally, postoperative DASH score was significantly improved. Our approach was different from the previous literature, it was reported that resection of the accessory slip was performed as the operative management. By the way, there was one patient who needed reoperation due to recurrent wrist pain. The thick fibrous tissue was found at the previous surgical area and it was excised, then pain was resolved.[4] The extensive fibrous tissue could possibly be one of the complications following exploration and slip resection. In our study, the procedure was limited to releasing the ECU by longitudinally opened sixth extensor compartment which showed favorable clinical outcomes and patient's satisfaction. This method is suggested to be the choice of operative management for patients with accessory ECU slip without sign of tendon instability on passive wrist motion intraoperatively.

The clinical context of patient with accessory ECU was initially described in 1986 by Barfred and Adamsen.[4] The variant was found when three patients underwent the wrist operation. Two of them presented with pain at ECU area, while another patient was found this structure incidentally. The accessory slip was resected in only two patients who presented with pain at this area, but there was one of these two patients who developed recurrent pain at the same area after 2 years of operation. The patient received reoperation by exploration and debridement of fibrous tissue and then able to resume to normal activities. Allende and Le Viet[6] retrospectively reviewed 27 patients with ECU tendon lesions and discovered seven patients (25.93%) with accessory ECU slip who were all treated by excision. However, the result of the treatment for ECU slip was not demonstrated specifically due to the study which was focused on the information of other pathologies of ECU tendon. Eo et al[5] presented a patient with dorsoulnar wrist pain who did not respond to any conservative methods of treatment. The ECU slip was found on exploration and excised. The patient's symptom was improved after the operation.

The accessory ECU was investigated about its anatomy in various cadaveric studies. Nakashima[3] examined 240 normal cadaver upper limbs and discovered 34.2% accessory ECU slip existed in the sixth extensor compartment. The slip was found arising from the main ECU and first categorized according to the three different insertions on the fifth metacarpal bone as follows: at the base (type A, 29.6%), the midsection (type B, 2.5%), and the head (type C, 1.7%). Pınar et al[2] dissected 54 cadaveric forearms and found the ECU slip in only three specimens (5.6%) which were all type C according to Nakashima.[3] The average width of the slip was similar in both studies ($1.53 \pm 0.37\ mm^3$ and $1.4 \pm 0.01\ mm^2$). Flood et al[8] also discovered this variant during the routine cadaveric dissection. The accessory ECU was found bilaterally which was originated from the muscular slip of ECU in the right side while I the left side, it arose from the ECU tendon under the extensor retinaculum. Another cadaveric study about accessory ECU was presented by Hinds et al[1] that examined in 25 matched-pair upper limbs (50 specimens). The accessory slips were identified in 11 specimens (22%) which were 10 matched pairs and only 1 unpaired. Regarding to Nakashima's study, types A and C slip were found in nine (82%) and two (18%) specimens, respectively. There was no type B slip found in this study. The variant was discovered relatively more in male (25%) than in female cadavers (18%).

Limitations

There were some limitations in this study. The plain film was the only preoperative radiographic assessment done for the patient. If further investigations, such as ultrasound or magnetic resonance imaging (MRI) scan could be provided, additional preoperative information could assist in diagnosis or treatment planning. The grip strength was not evaluated preoperatively and there was limited data for comparison; also, the preoperative DASH score which was assessed in postoperative period would be the risk of recall bias.

Conclusion

The accessory ECU slip is another one of pathologies of ECU problems and should be aware of as an etiology of ulnar-sided wrist pain. This report presented the successful surgical treatment of bilateral accessory ECU. The surgical treatment may be considered after failure conservative treatment.

Conflict of Interest
None declared.

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