



Case report

One case of wrist cyst rupture with nerve and blood vessel compression

Jianyu Wang^a, Haisi Dong^{b,*}, Xiangyang Leng^{a,*}^a College of Traditional Chinese Medicine, Changchun University of Chinese Medicine, Changchun 130117, Jilin Province, China^b Jilin Ginseng Academy, Changchun University of Chinese Medicine, Changchun 130117, Jilin, China

ARTICLE INFO

Keywords:

Wrist
Tendon cyst
Auxiliary examination
Surgical treatment

ABSTRACT

Introduction and importance: Tendon sheath cysts are mostly located around the joint capsule and tendon sheath, which often occur in the wrist, ankle, and wrist back (O'Valle et al., 2014; Nguyen et al., 2004 [1, 2]). The palmar side of the wrist is relatively rare, which is often associated with the wrist. Ultrasound and MRI can detect and diagnose early.

Case presentation: In this case report, we discussed an elderly woman with palmar carpal tendon sheath cyst and ruptured. She communicated with the outside world through the skin sinus, and at the same time pressed the radial artery and the median nerve to produce obvious clinical symptoms.

Clinical discussion: Because of its deep position and close relationship with the surrounding important nerves and vessels, the operation was relatively difficult. In particular, in this case, tendon sheath cyst ruptured to form sinus, so there were some difficulties.

Conclusion: Pathological diagnosis was tendon sheath cyst. The analysis of the relationship between the tumor and the surrounding tissue by preoperative MRI and other imaging examinations has important guiding significance for surgery.

1. Case information

1.1. Clinical data

The patient, a 67-year-old woman, was admitted to the department with a 45-day history of right wrist tumor rupture and hand numbness. The patient had no history of drug abuse, no family history, no history of smoking and drinking, and had a good mental state. Special physical examination: the palm side of the right wrist radial side visible a tumor, about 20 × 15 mm in size. The skin on the surface of the tumor was dull, and a skin sinus was visible in the center. Some scabs were formed on the surface, and gel-freeze-like liquid exudation was visible. The tumor touched softly, adhered closely to the surrounding tissue, and could touch the radial artery pulse. Capillary refill of the five fingers was good, and the blood supply was good. The activities of the right wrist joint and the five fingers were not significantly limited. The muscle strength was grade V, and the right thumb, index finger and middle finger felt numbness (Fig. 1). Auxiliary examination: MRI examination of wrist joint showed oval long T1 and long T2 signals in the radial joint space of the right wrist, and high signal on T2 WI fat compression, about 18 × 11.57 mm in size. The lesions showed isthmus and septum, and the

radial artery and median nerve were significantly compressed in the wrist (Fig. 2). This case is reported in line with the SCARE criteria [3].

1.2. Method

1.2.1. Surgical resection

After the preoperative examination was completed, the surgical contraindications were excluded. After preoperative discussion, the left wrist tumor resection was performed under local anesthesia. Surgery operated by the authors. The patient was supine, and the right upper limb was extended and abducted. Local block anesthesia was performed around the tumor with 2 % lidocaine. After the anesthesia was effective, the surgical area was prepped and draped in usual fashion, and sterile sheets were laid. The operation began: 30 × 10 mm ellipse incision was made at the center of the sinus tract formed by the tumor and skin, and the skin of the sinus tract and some dark and light skin were removed, and the tumor was gradually separated and exposed (Fig. 3 - A). During the operation, the cyst wall of tendon sheath cyst was adjacent to the scalp vein of the wrist, and there was adhesion (Fig. 3 - B). At the same time, the cyst wall wrapped the radial artery layer by layer, and the adhesion was tight and the compression was serious (Fig. 3 - C). The

* Corresponding authors.

E-mail addresses: adonghaisi@163.com (H. Dong), lengxiangy@163.com (X. Leng).<https://doi.org/10.1016/j.ijscr.2022.107676>

Received 25 July 2022; Received in revised form 12 September 2022; Accepted 17 September 2022

Available online 21 October 2022

2210-2612/© 2022 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

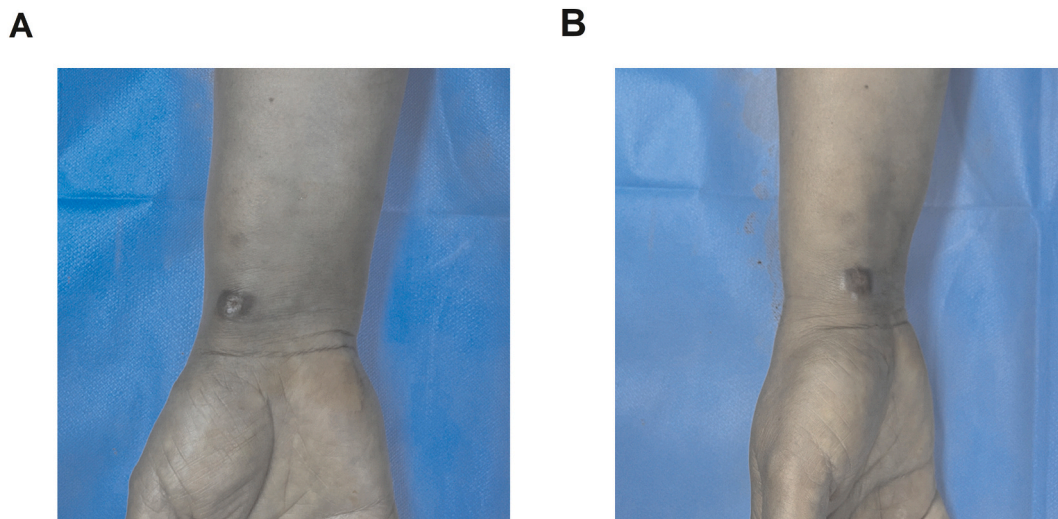


Fig. 1. A: Front view image of wrist cyst. B: Lateral view image of wrist cyst.

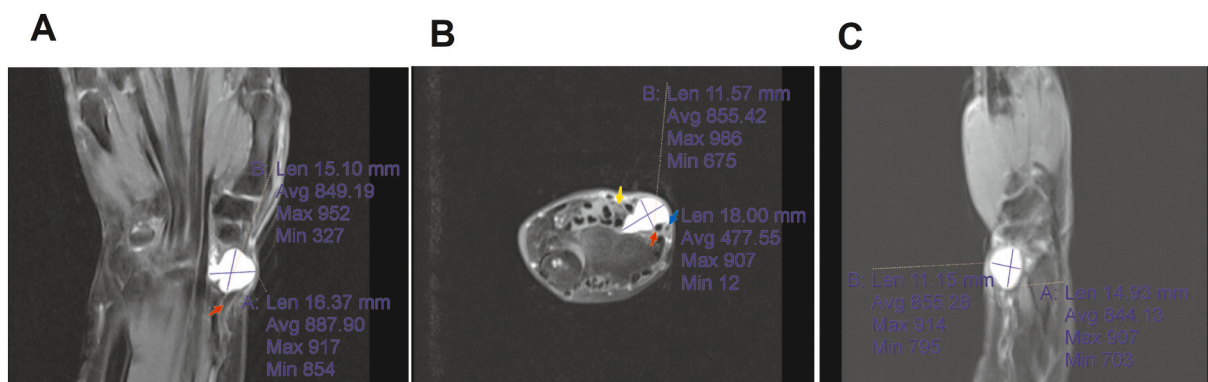


Fig. 2. A: MRI examination of wrist cysts coronal images. The red arrow showed radial artery compressed by wrist cyst. B: MRI examination of wrist cysts transverse images. The yellow arrow showed the median nerve compressed by wrist cysts, the red arrow showed the radial artery compressed by wrist cysts, and the blue arrow showed the head vein compressed by wrist cysts. C: MRI examination of sagittal images of wrist joint cyst. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

tendon sheath cyst had slight compression on the median nerve of the wrist. The blood flow of nutrient vessels branches were interrupted on the surface of median nerve of wrist (Fig. 3 - D). Attention should be paid to the protection of nerves, blood vessels and other important tissues during the operation. The cyst was stripped and removed layer by layer (Fig. 3-E). The cyst size was about 20 × 15 mm. The cyst was a multinodular cyst with yellow jelly-like liquid. The deep part of the cyst was pedicled, which was closely related to the wrist. The cyst was completely separated from the surrounding tissues and completely removed (Fig. 3-F). The wound cavity was washed thoroughly, no obvious active bleeding was found in the wound cavity, and the bleeding was stopped thoroughly. The incision was sutured layer by layer, and the sterile dressing was wrapped well. After the operation, the specimen was sent to pathology. Postoperative hospital treatment, to prevent infection, timely dressing treatment.

1.2.2. Pathological examination of specimens

General view: 1 cystic tumor, size 13 × 7 × 5 mm, multilocular cystic. Microscopically, the cystic wall was composed of fibrous tissue. Local cystic wall showed glass-like changes, with infiltration of lymphocytes and plasma cells in the cystic wall, and focal vascular dilatation and congestion (Fig. 4). Pathological diagnosis: tendon sheath cyst.

The postoperative incision healed well without obvious infection and exudation. The numbness in the hand gradually disappeared on the

second day after operation. On the seventh day after operation, there was no numbness in the hand. The radial artery pulse was palpated. The incision was healed now. Patients are satisfied with the current treatment.

2. Discussion

This case has the following characteristics: rupture of tendon sheath cyst, compression and adhesion of important blood vessels, and compression of important nerves. Although tendinous cysts are common in clinical practice [1], tendinous cysts on the palmar side of the wrist are relatively rare. In this case, the tendon sheath cyst was resected to achieve the purpose of treatment, and the auxiliary examination played an important role. MRI has a very important guiding significance for the clear diagnosis and surgical treatment. It is because the MRI examination found that the tendon sheath cyst was closely related to the radial artery and the median nerve, which reduced the nerve and blood vessel damage caused by intraoperative operation errors, and avoided the surgical complications caused by this, and played a protective role in the nerve and blood vessel. At the same time, it is found that it is difficult to achieve the healing effect through non-surgical treatment for the ruptured tendon sheath cyst that forms the sinus tract with the outside world. It is often repeatedly ruptured and the wound does not heal. Even during the operation, the skin around the sinus tract should be

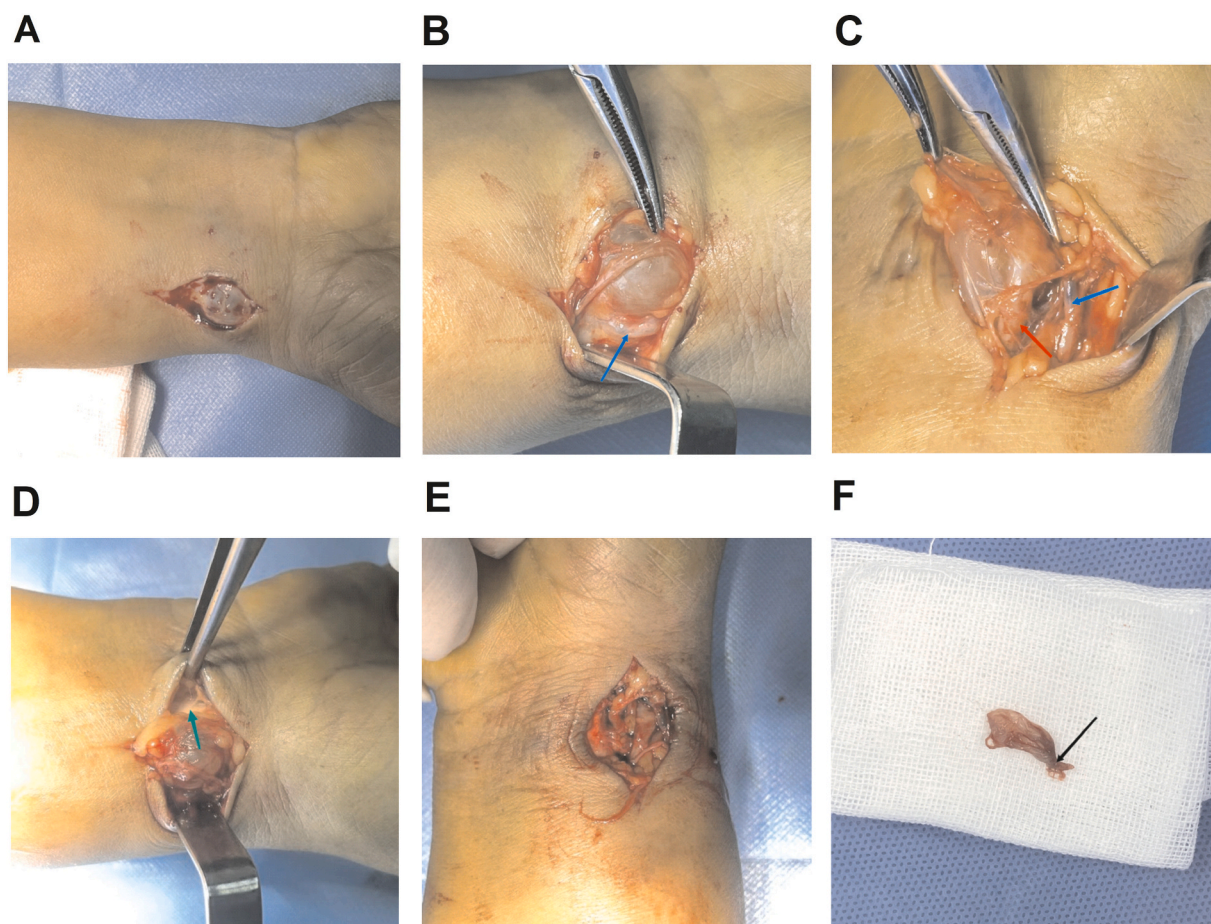


Fig. 3. A: Spindle excision of necrotic black skin and subcutaneous tissue around sinus tract, separation of surrounding tissue gradually revealed wrist cysts. B: The wrist cyst is adjacent to the head vein, and there is mild adhesion and compression. The blue arrow shows the head vein. C: Wrist joint cyst wall of radial artery wrapped serious adhesion, there is a serious compression. Red arrow shows radial artery, blue arrow shows head vein. D: The median nerve of wrist was slightly compressed by wrist cyst. The nutrient vessels on the surface of median nerve of wrist were disrupted. The green arrow shows the median nerve. E: Vascular and nerve protection after complete excision of wrist cyst. F: Complete excision of wrist cyst, black arrow showing cyst pedicle. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

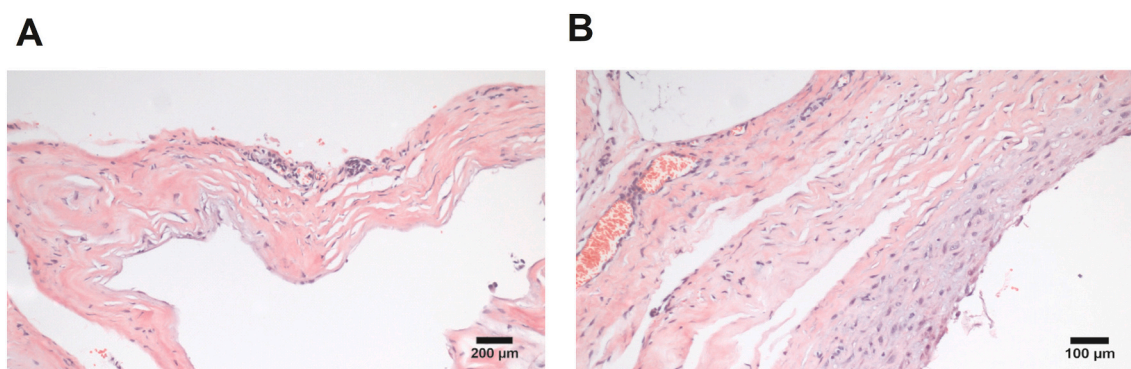


Fig. 4. The capsule wall is composed of fibrous tissue. Glassy changes of local capsule wall, infiltration of lymphocytes and plasma cells in capsule wall, focal vasodilation and congestion. A: Scale = 200um. B: Scale = 100um.

debrided, and the skin and subcutaneous tissue around the sinus tract should be removed. Only when the wound is fresh, can the normal healing of the incision after the excision of the cyst be ensured. Tendon sheath cyst is a common disease, and surgical treatment is also a conventional treatment. However, if the above situation occurs, it should still be treated with caution and be alert to serious complications.

At present, there are many statements about its pathogenesis, and it

is believed that it may be related to degenerative injury in and around the joint capsule, synovial hernia around tendon sheath, mesenchymal tissue metaplasia, repeated trauma or ligament injury [2]. Loder et al. [4] compared finger mucinous cyst and tendon sheath cyst and found that although they had different occurrence sites, they had the same performance in optics and electron microscopy, so they believed that they were caused by the same reason. High-frequency color Doppler

ultrasound is a non-invasive examination method, which has the advantages of low price, simple operation and no side effects. It has been accepted by patients, especially suitable for the examination and diagnosis of muscles, joints and ligaments [5]. The principle of high-frequency color Doppler ultrasound in the examination of tendon sheath cysts is mainly due to the different density and acoustic impedance of different tissues in the human body. When ultrasound is performed, ultrasound will pass through the acoustic interface between the two tissues to form different echoes. Doctors can judge the pathological changes of tendons, articular cartilage and ligaments according to this echo performance [6]. Although MRI is expensive, it has high tissue resolution and good indications for soft tissue and joint injury, so it has great clinical value [7]. Tendon sheath cyst usually needs surgical treatment. Surgical resection of the cyst and release of external pressure factors can quickly reduce edema, numbness, pain and other symptoms. At the same time, the long-term effect is good. Complete resection of the cyst wall is performed by surgery. If there is a pedicle connected with the articular cavity, after the removal of the cyst, the joint capsule needs to be repaired, ligated, repaired and connected with the joint capsule to prevent postoperative recurrence [8]. In recent years, with the extensive development of arthroscopic surgery, more and more scholars have adopted arthroscopic surgery to remove cysts and relieve compression symptoms, which has achieved good results and low recurrence rate [9–11].

3. Conclusion

In summary, palmar carpal ganglion cyst is relatively rare, and because of its deep location, it is often delayed in diagnosis or difficult to find. When it is large or because of pain, swelling, numbness and other corresponding clinical symptoms when pressing surrounding important tissues, it is easy to be found. Symptomatic ganglion cyst often needs surgical resection, and ruptured ganglion cyst appears. It should be operated in time to prevent infection caused by the same articular cavity as the outside world. The final diagnosis of tendon sheath cyst depends on pathological diagnosis. Ultrasonography and MRI have good reference value for diagnosis and surgical treatment.

Ethical approval

All patients with surgical procedures, surgical methods, possible complications and risks were informed. And the above details have been informed consent of patients and their families. All operations were completed by the Affiliated Hospital of Changchun University of Traditional Chinese Medicine. All procedures were guided and allowed by the Ethics Committee of Affiliated Hospital of Changchun University of Traditional Chinese Medicine (number: CCZYFYLL-SQ-2021).

Funding

This study was supported by Jilin Province Young and Middle-aged Science and Technology Innovation and Entrepreneurship Outstanding Talent (team) Project (No. 20210509001RQ).

Guarantor

Xiangyang Leng

Research registration number

CCZYFYLL-SQ-2021

Author contribution

The first author of the manuscript is a surgeon who has been trained. All authors have a clear understanding of the content and agree to publish.

Declaration of competing interest

The authors declare that they have no competing interests.

References

- [1] F. O'Valle, P. Hernandez-Cortes, J. Aneiros-Fernandez, et al., Morphological and immunohistochemical evaluation of ganglion cysts. Cross-sectional study of 354 cases, *Histol. Histopathol.* 29 (5) (2014) 601–607.
- [2] V. Nguyen, J. Choi, K.W. Davis, Imaging of wrist masses [J], *Curr. Probl. Diagn. Radiol.* 33 (4) (2004) 147–160.
- [3] R.A. Agha, S.C.A.R.E. The, et al., Guideline: updating consensus surgical CARE REport (SCARE) guidelines int, *J. Surg.* 84 (2020) (2020) 226–230.
- [4] R.T. Loder, J.H. Robinson, W.T. Jackson, et al., A surface ultrastructure study of ganglia and digital mucous cysts (J), *J. Hand Surg. Am.* 13 (1988) 758–762.
- [5] Guyang Jinlan, Zhang Kexun, etc., Diagnostic value of high frequency ultrasound in soft tissue mass of foot [J], *Medical clinical research* 33 (2) (2016) 376–378.
- [6] Ru. Nie, Li Xiaolan, Deng Yuqing, Clinical value of high frequency color doppler ultrasound in the diagnosis of soft tissue masses around joints and tendons [J], *Modern diagnosis and treatment* 27 (14) (2016) 2669–2670.
- [7] K. Woertler, Soft tissue masses in the foot and ankle: characteristics on MR imaging [J], *Semin. Musculoskelet. Radiol.* 9 (3) (2005) 227–242.
- [8] Li Jiayang, Treatment report of 7 cases of iliopubic cyst, *Chinese bone injury* 14 (6) (2001) 351.
- [9] N. Nakano, V. Khanduja, Medial synovial fold cyst in the hip leading to pectineofoveal impingement [J], *J Hip Preserv Surg* 4 (1) (2017) 93–96.
- [10] N.V. Bardakos, Hip impingement: beyond femoroacetabular [J], *J Hip Preserv Surg* 2 (3) (2015) 206–223.
- [11] M. Tey, S. Alvarez, J.L. Rios, Hip labral cyst caused by psoas impingement [J], *Arthroscopy* 28 (8) (2012) 1184–1186.