Case Report

Case Series of Non-Specific Volar Wrist Swellings in a Malaysian Urban Tertiary Centre

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Abstract

We collected a series of 5 patients with non-specific volar wrist swellings which were not ganglions. These swellings were of a mean 4x4cm in measurement with a vague history. The dilemma was to decide a correct diagnosis in clinic to ensure the relevant investigations were performed and to adequately inform patients who were worried and anxious about the swelling. Symptom presentations were pain (n=4), carpal tunnel syndrome symptoms (n=3) and one had triggering of the middle finger. The mean age was 54.8 years and mean duration to surgery was 15 months. All had the swelling on their dominant wrist and underwent surgical excision. Finally, two swellings were tuberculosis (TB), one was gout and two were tenosynovitis.

Keywords: Flexor tenosynovitis; gouty wrist; tenosynovitis; tuberculosis wrist; volar wrist swelling

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Introduction

Volar wrist swellings are commonly seen in our urban tertiary centre with a wide variety of presenting symptoms and diagnoses with some lesions being more common than others, for example the ganglion cyst (1). Though some may be asymptomatic, the main concerns of these patients are fear of malignancy and for cosmetic reasons (1). Some of the symptoms mimic the conditions like carpal tunnel syndrome, which is treatable with a simple carpal tunnel release, whilst some have a more serious presentation that affects their quality of life and may have disastrous consequences if untreated. Most if not, all are relatively straightforward in getting to the diagnosis clinically whilst some require surgical excision and histopathological examination. This case series reports five cases that presented with volar wrist swellings with a variety of associated symptoms and diagnoses.

Case Report

Case 1

A 75-year-old retired chef with not known medical illness presented with painless right volar wrist swelling measuring 5cm x 6cm. He was not able to flex or extend his index and little fingers for 2 months. The swelling was firm in nature, ill-defined with positive tinnel sign. There was no night pain, constitutional symptoms, or other systemic complaints. He denied tuberculosis (TB) contact.

His blood investigations showed white cell count (WCC) of 12.3 x 10^9/L, erythrocyte sedimentation rate (ESR) of 88 mm/hr, rheumatoid factor (RF) negative and serum uric acid of 458 mmol/L (Table 1). His plain radiograph showed only soft tissue swelling over the right wrist joint with no suspicious bony lesions. Magnetic resonance imaging (MRI) was done showed diffuse enhancing thickened flexor tendon sheath and the synovium of the flexor tendons at the volar aspect of the distal forearm and wrist. The synovium was mildly thickened but still smooth. The tendons

TABLE 1: Investigation findings for each case presented

	Age (years)	Gender (M/F)	Duration between development of lump and surgical intervention (months)	WCC (10^9/L)	ESR (mm/ hr)	RF	Uric Acid (mmol/ L)	C&S	TB PCR	HPE	Diagnosis
Case 1	75	M	2	12.3	88	Neg	458	No Growth	Pos	Multinucleated giant cells of Langhans	Tuberculous Flexor Tenosynovitis
Case 2	65	M	48	7.4	33	Neg	353	No Growth	Neg	Scattered Langhans type multinucleated giant cells	Tuberculous Flexor Tenosynovitis
Case 3	67	F	1	4.8	22	Neg	-	No Growth	Neg	-	Chronic Flexor Tenosynovitis
Case 4	35	M	12	-	-	Neg	647	-	-	Scattered small and large amorphous cotton wool-like eosinophilic deposits	Gouty Flexor Tenosynovitis
Case 5	32	F	12	6.8	62	Neg	-	No Growth	Neg	Fibrocollagenous and fibrofatty tissue composed of lobules of mature adipocytes	Chronic Flexor Tenosynovitis

appeared to be far separated from each other due to thickened synovium and surrounding oedema however no abnormal intensity was seen within the flexor tendons. There were also small low signal foci seen within the tendon sheath, which may represent rice bodies. The adjacent median nerve was flattened, however no abnormal signal intensity was seen within. The lesion did not extend into the wrist joint and the extensor compartment. Findings were suggestive of inflammatory changes of the synovium and flexor tendon sheaths with the presence of rice bodies, which was likely, suggested tuberculous synovitis (Fig. 1).

Excision biopsy and synovectomy were done. Intraoperative findings showed thickened synovium from the wrist joint until mid-forearm encapsulating all the flexor tendons (Fig. 1). The median nerve appeared to be flattened and displaced ulnarly due to the thickened synovium. However, there were no rice bodies seen.

Bacterial, fungal and tuberculosis (TB) culture from the sample were negative. However, the TB polymerase chain reaction (PCR) and GeneXpert were positive. Histopathological examination (HPE) was

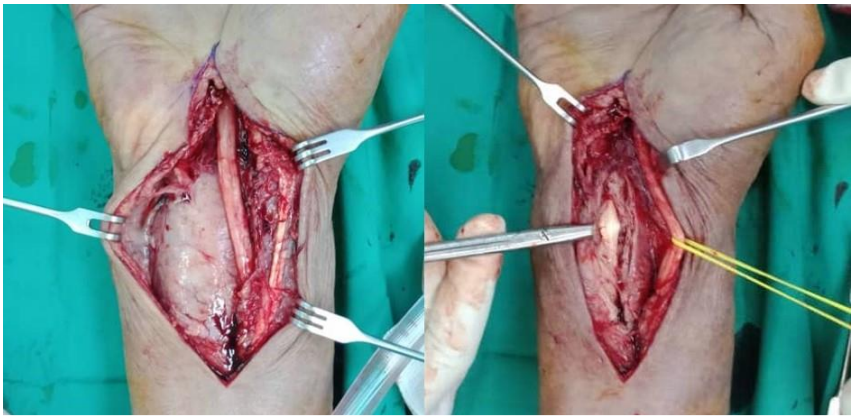

FIGURE 1: Intraoperative images pre-excision (left) and post-excision (right)

reported to have multiple foci of epithelioid granulomas with central caseating necrosis. Numerous multinucleated giant cells of Langhans were seen. The granuloma was surrounded by lymphocytes and plasma cell infiltration. No evidence of malignancy was noted. Zhiel Neelsen (ZN) stain was negative. The results were in keeping with tuberculous flexor tenosynovitis.

Extrapulmonary TB was started on a quadruple therapy consisting of rifampicin, isoniazid, pyrazinamide, and ethambutol (anti-TB medications). The function of his right index and little fingers were starting to improve but limited movement during one-month post-surgery with physiotherapy. His wound had healed well and was uncomplicated.

Case 2

A 65-year-old man with not known medical illness initially presented to a private centre in 2016 for right wrist pain radiating to his right middle, ring, and little fingers with no swelling noted. He was diagnosed with right carpal tunnel syndrome and was treated with carpal tunnel release. His symptoms only resolved for 6 months. The pain recurred, and a repeat carpal tunnel release was done in 2017 by the same centre. His symptoms resolved for about 2 years. He was able to carry out daily activities with no limitations. In 2019, a second recurrence occurred. This time there was a notable 3cm x 4cm swelling on the volar aspect of the right wrist and developed night pain as well. The patient denied any TB contact, constitutional symptoms, or other systemic symptoms.

His blood investigations showed WCC of 7.4 x 10^9/L, ESR of 33 mm/hr, RF negative, and serum uric acid of 353 mmol/L (Table 1). A plain radiograph of his right wrist showed no suspicious bony lesions, only soft tissue swelling over the right wrist joint. The MRI showed distension of the palmar bursae (involving both ulnar and radial bursae) by complex material consisting of numerous low signal foci (suggestive of rice bodies) against a background of fluid signal intensity on T2 weighted images. The lesion encased the flexor digitorum and flexor pollicis longus. Distally, extension of the ulnar bursa up to midshaft of first metacarpal. Proximally, the distended bursae extended approximately 3.7 cm proximal to the flexor retinaculum. No abnormal signals were noted within the flexor digitorum, flexor pollicis longus, flexor carpi ulnaris, flexor carpi radialis, and palmaris longus tendons. The median nerve appeared normal. No abnormal marrow signal, bony erosion, or blooming artifacts to suggest bleeding or calcification.

An excision biopsy was performed. It was noted synovial hypertrophy over the right wrist extending into thenar and hypothenar spaces displacing the median nerve volarly intraoperatively. There were also rice bodies and synovial fluid noted within the tendon sheath, as seen in Fig. 2. The tendon sheath encapsulated the palmaris longus and was unable to be peeled off and removed thus the palmaris longus was sacrificed.

The bacterial, fungal, and TB culture were negative. TB PCR was negative for both the fluid and tissue from the tendon sheath. HPE showed synovial tissue harbouring granulomas composed of cohesive clusters of epithelioid histiocytes and lymphocytes with scattered Langhan's type multinucleated giant cells. No evidence of malignancy was noted, and the Ziehl Neelsen stain was negative too. The rice bodies came back as fibrinous nodules with chronic granulomatous inflammation. The findings were in keeping with chronic granulomatous inflammation.

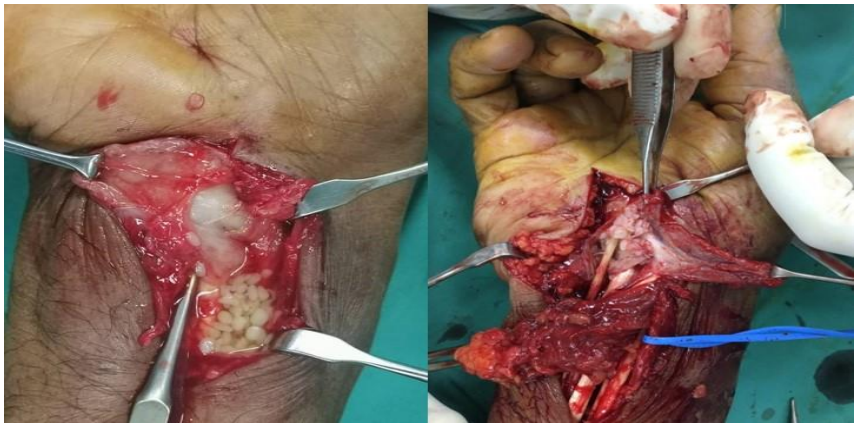

FIGURE 2: Intraoperative images pre-excision (left) and post-excision (right)

Anti TB was commenced as his HPE was indicative of TB synovitis even though his TB cultures and TB PCR were negative. Physiotherapy was started together with TB treatment.

Case 3

A 67-year-old lady presented to our outpatient's clinic with 3cmx3cm painful volar right wrist swelling for one month duration. The pain was associated with the movement of the wrist joint and on and off numbness of all the fingers over the palmar aspect. The swelling changes in size based on the activity done. The swelling was soft in nature and non-tender. Tinnel's sign was negative on the swelling and at the time of examination, the sensation was intact on all the fingers with no limitation on power and range of motion of the fingers and wrist.

Her blood investigations showed WCC of 4.8 x 10^9/L, ESR of 22 mm/hr, and RF negative (Table 1). Plain radiograph of his right wrist showed no suspicious bony lesions, and minimal soft tissue swelling shadow over the right wrist joint. An ultrasound showed right wrist flexor digitorum tendinopathy and tenosynovitis with proximal median nerve hypertrophy and minimal fluid around the flexor tendons proximally. No focal mass was seen arising from the tendon sheath. Features were suggestive of carpal tunnel syndrome.

An extended carpal tunnel release was done. Intraoperatively, the median transverse carpal ligament was thickened, the median nerve appears healthy and not flattened and there was very minimal fluid collection within the flexor tendon sheath (Fig. 3). Fluid samples were sent for culture & sensitivity (C&S) and fungal culture only. There was no hypertrophied tendon sheath hence no HPE was needed. There was inadequate fluid to be sent for TB culture and PCR.

Two weeks postoperatively, her wound was complicated with a stitch abscess that was treated with oral ampicillin-sulbactam 375mg twice daily for a week and the stitch was removed. Since then, her wrist's swelling and pain did not recur, and her wound had healed well. She underwent physiotherapy and remained well during follow-ups.

Case 4

A 35-year-old man with underlying gouty arthritis for eight years, not on a regular follow up and only taking medication over the counter (OTC), presented to us with right wrist swelling for 1 year. The swelling was associated with pain over the wrist, numbness over all the fingers of the right hand on the palmar aspect and triggering of the right middle finger. Upon presentation, the triggering of his middle finger was already at grade IV, based on the Green Classification for trigger fingers. The swelling was firm in nature with tinnel's and Durkan's test positive. Sensation over the median nerve distribution was reduced and so was the power of the abductor pollicis brevis and opposition of the fingers. There was night pain however there was no TB contact, constitutional symptoms, or any other systemic symptoms.

His blood investigations showed serum uric acid of 647 mmol/L (Table 1). No other blood investigations were taken at the time. Plain radiograph showed no obvious bony lesion, calcification nor obvious soft tissue swelling. No MRI or ultrasound was done as the clinical diagnosis established was likely flexor tendon intratendinous gouty tophi impinging on the median nerve.

Extended carpal tunnel release was done. Intraoperatively, there were infiltration with chalky white tophaceous material between the flexor

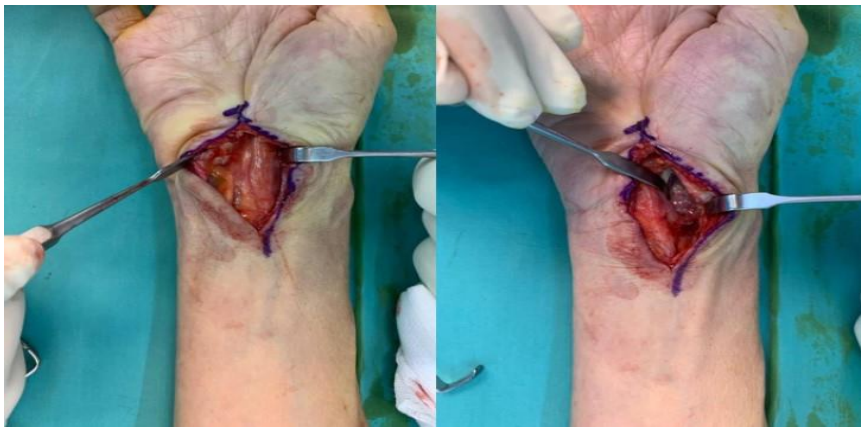

FIGURE 3: Intraoperative images pre-excision (left) and post-excision (right)

digitorum superficialis (FDS) and the flexor digitorum profundus (FDP), within the FDS itself and within the transverse carpal ligament (Fig. 4). The median nerve however was not affected by the tophaceous material but was flattened due to mass effect. The chalky white tophaceous material was removed. The FDS and transverse carpal ligament were released. Post release and decompression noted good gliding of the FDS tendon. Only tissue HPE was sent postoperatively.

The HPE results showed scattered small and large amorphous cotton wool-like eosinophilic deposits surrounded by numerous multinucleated giant cells and some lymphoplasmacytic infiltration. Foamy macrophages were also seen. No evidence of malignancy seen.

He started on oral cefuroxime 500 mg twice daily for a week postoperatively in view of prolonged surgery. At 3 months post-operation, his wound had healed well, and his symptoms had resolved with the help of physiotherapy.

Case 5

A 32-year-old lady with not known medical illness presented with right wrist swelling for one year. The swelling was asymptomatic initially but has since increased in size and followed by pain. At the time of presentation, the swelling was 3cm x 3cm on the volar aspect of the right wrist, minimal tenderness on palpation, firm in nature and ill defined. Tinnel's sign

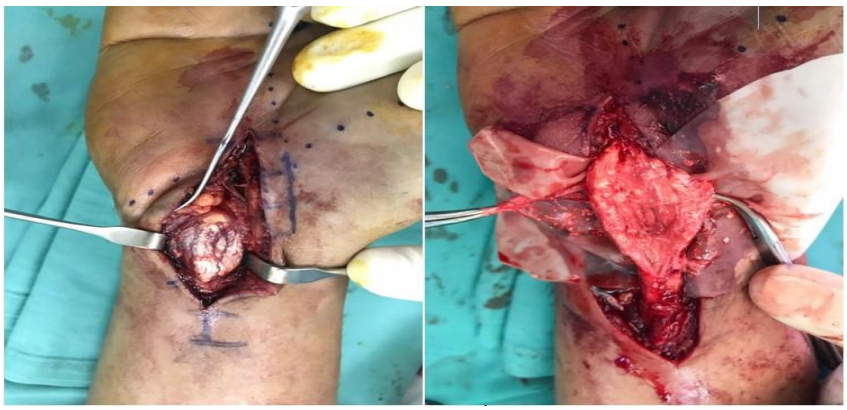

FIGURE 4: Intraoperative images pre-excision (left) and post-excision (right)

was negative over the swelling. She denied any TB contact, night pain, constitutional symptoms, and other systemic symptoms.

Her blood investigations showed WCC of 6.8 x 10^9/L, ESR of 62 mm/hr, and RF negative (Table 1). Plain radiograph of the right wrist showed no suspicious bony lesions, calcifications but minimal soft tissue swelling. No other imaging was done.

She underwent excision biopsy of the right wrist swelling. Intraoperatively, it was noted that there was hypertrophied and thickened synovium over the flexor tendon sheath. It was soft firm in consistency with suggested fibrotic changes. No rice bodies were seen.

The tissue C&S, fungal culture, TB culture and TB PCR were all negative. HPE showed fibrocollagenous and fibrofatty tissue composed of lobules of mature adipocytes separated by fibrous septa. The stroma showed mild lymphocytes and plasma cells infiltration. No evidence of malignancy was seen. Features were consistent with chronic synovitis.

She was not started on any medical therapy. The wound was well healed upon follow up. She remained pain free with physiotherapy.

Discussion

Synovitis may destroy tendons, cartilages, and bone in a closed space either by attrition or by direct invasion by hypertrophic tenosynovium. Treatment is usually a combination of both surgical and medical approaches. Surgery alone does not guarantee no local recurrence, but it takes away the local progression and destruction of tendons, nerves, and bones in the affected region (2,3). Therefore, early presentation and intervention are the keys in treating tenosynovitis suspected volar wrist swellings. The mean time interval between development of volar wrist swelling and surgical intervention in our case series was 15 months. Proper

education and public awareness of the condition may help to reduce this interval hence result in better outcome.

Primary tuberculous tenosynovitis is a rare condition with only 5% of cases of osteoarticular TB selectively targeting the volar aspect of the wrist and hand, especially on the right side (4). Men are more likely to be affected than women (4). Both of our tuberculous flexor tenosynovitis cases were men and it affected their right wrist. In case 1, his positive TB PCR, GeneXpert and HPE showing Langhan's type multinucleated giant cells pointed his diagnosis to tuberculous tenosynovitis. However, in case 2, the confirmation of our diagnosis was only based on Langhan's type multinucleated giant cells on HPE. In both cases, tuberculosis culture were negative and acid-fast bacilli (AFB) was not seen on ZN stain. Thus, this shows the importance of HPE, in order not to misdiagnose or underdiagnose. GeneXpert has been reported to have a higher sensitivity and specificity when compared to conventional methods in detecting tuberculosis (5). Unfortunately, due to its high cost, tissue sample was not sent for the case 2.

Presence of rice bodies on another note does make a case highly suspicious though they do not primarily represent TB. Similar loose bodies can also be seen in rheumatoid arthritis, systemic lupus erythematosus (SLE) and seronegative arthritis (6). Culture and HPE are still needed to confirm the diagnosis.

Gouty tenosynovitis is a potential differential diagnosis when the patient has underlying gout disease. Tophi may appear years after the initial inflammatory attack if the hyperuricemia is not or inadequately treated (7), which was seen in our case 4. Even then, about 5% of the patients may not respond to medical treatment and will advance to the tophaceous stage (7). Gouty involvement of the hand is normally seen when there was extensive involvement elsewhere in the body and is more likely in patients with prolonged history of gout (8). Thus, it is uncommon to see gouty tenosynovitis in a young patient with a short history of hyperuricemia as in our case 4. Further progression of tophi deposits in the tendon sheath, may lead to tendon rupture and entrapment neuropathy (7), making accurate and early diagnosis followed by appropriate surgical intervention based on a high index of suspicion is essential in restoring the patient’s hand function and reducing morbidity.

Chronic tenosynovitis secondary to rheumatoid arthritis (RA) too should not be singled out of the differential in any clinical setting. As in our case 3 and case 5, all the results from the samples were negative, including rheumatoid factor. In such cases, seronegative rheumatoid arthritis causing the tenosynovitis needs to be considered. Anticyclic citrullinated peptide (anti-CCP) antibodies that were sent for these patients too came back with negative results. Anti-CCP have been shown to be of high sensitivity and specificity for early and seronegative rheumatoid arthritis (2).

Conclusion

This case series demonstrated that a high suspicion for TB, rheumatoid arthritis or gout are needed when managing patients present with soft to firm volar wrist swellings. Plain radiographs may or may not be of importance when it comes to operative planning. Ultrasound may give a rough idea of what the content of the swelling is but may not give much information on the extent of the swelling and it is very operator dependent. MRI will give the benefit of being able to demonstrate the extent and infiltration of the swelling and the structures involved for proper preoperative planning. In all the cases in this series, surgical excision and synovectomy were the main treatment modalities. Delayed surgical excision of the lesion may result in tendons to rupture and joint spaces being involved. There was no role of medical treatment alone in patients presenting with the above complaints. A combined approach is necessary to ensure symptoms and recurrence free.

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