Contact Hands' Tendonitis Due to Paper Parasites

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International Journal of Clinical Case Reports 2013, Vol.3, No.13  doi: 10.5376/ijccr.2013.03.0013

Received: 29 Aug., 2013
Accepted: 30 Aug., 2013
Published: 30 Aug., 2013

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Preferred citation for this article as: Creaco et al., 2013, Contact Hands’ Tendonitis Due to Paper Parasites, International Journal of Clinical Case Reports, Vol.3, No.13 58-61 (doi: 10.5376/ijccr.2013.03.0013)

Abstract We have analyzed a case of tendonitis following an instrumental diagnostic process that has led to the diagnosis. The patient was subjected to clinical chemistry and serology tests and instrumental examinations. Only anomalous datum was a very high hypereosinophilia. In our case, responsible of tendonitis was a parasite of the paper that may give rise to allergic phenomena. The proof of our thesis is the finding of some “Psocoptera” parasites in the place where our patient worked. Beside symptoms disappeared when the patient has changed his job.

Keywords Tendonitis, Hands, Paper parasites, Psocoptera

1 Introduction
Tendonitis are characterized by inflammation of a tendon (tendonitis) and of its covering sheath. Symptoms include localized pain along the course of the tendon, that sometimes makes it impossible to move. The cause is often unknown. Tendonitis usually affect both middle age people and older people as vascularity of tendons reduces with the age (Tang, 2006). Repetitive micro-trauma may increase the damage.

Tendonitis can also be linked to systemic diseases or a very high serum cholesterol levels (Frick and Murthy, 2010).

2 Case report
We have analyzed a case of tendonitis following an instrumental diagnostic process that has led to the diagnosis. The patient gave the informed consent prior being included into this study. We observed the case of a 23-years-old male. He said that an unknown insect stung his chin approximately in May 2010. The doctor has treated him with corticosteroids and antibiotics because of fever, asthenia and general malaise. Subsequently, the patient felt dizzy and pain in his hands. This made him difficult to flex and extend his fingers of both hands, symptoms were heavily visible at the fourth finger of the left hand. The Diagnosis was hands tendonitis of unknown origin.

On physical examination the patient showed red skin and pain along the course of flexor tendons of the hands. Functional limitation of flexion-extension in all fingers. Symptomatology is attenuated with consume of NSAIDs without a complete remission. Episodes of pain aggravation occurred in discontinuous stages with reference of taking anti-inflammatory drugs or not.

The patient was subjected to clinical chemistry and serology tests. The only anomalous datum was a very high hyper eosinophilia.

Parasitological, microbiological, serological and diagnostic instrumental tests are reported as it:

- Parasitic tests=Negatives
- Searching for Toxocara antibodies (IgM and IgG)=Negative
- Searching for Trichinellosis antibodies (IgM and IgG)=Negative
- Search for anti-Toxoplasma (IgM and IgG)=Negative
- Search for anti-Anisakis Sp (IgM and IgG)=Negative
- Search for HBsAg antibody=<0.20 (Negative<0.4)
- Search for CMV antibodies (IgM)<8.00 (Negative<0.15)
- Search for measles antibody (IgG)=Negative
- Search for visual acuity Measles antibody (IgG)=
Positive
- Immunoglobulin: IgA, IgG, normal, IgM 295 mg/dl (34–210 mg/dl)
- ATIII 0.24 (see No 0:19 to 0:31)
- Autoantibodies: ANA, AMA, ASMA, APCA, ENA, ANCA, anti-cardiolipin, anti-DNA monoclonal antibodies.
- Micro and macroscopic tests of parasites in the gastric secretion, duodenal secretions, duodenal-gastric reflux = negative.

3 Instrumental Examinations
Ultrasound of flexor tendon of the fourth finger of the left hand.

It is documented the presence of alteration in the sheath of flexor tendons, associated with increased vascular signals, as a condition of hyperemia. Tendons have regular thickness and a normal structure. There is an increased of vascular signal expression of phlogosis (Figure 1).

4 Ultrasound of lymphatic system
No significant pathological adenopathy in para-jugular and infraclavicular regions. Right axillary lymph nodes below the pectoralis major of 20 mm of diameter, oval hilum are discreetly maintained. No signs of pathological vascularization. Axillary lymph nodes posterior to pectoralis major reach 25 mm of maximum diameter, with preserved hilum. Bilateral inguinal lymph nodes (35 mm diameter), oval, with preserved hilum, with no signs of pathological revascularization.

5 Thyroid ultrasound
Normal sized thyroid, slightly uneven due to the presence of a small nodular formation in the medium right lobe, with 4 mm × 5 mm × 8 mm of diameter; characterized by inhomogeneous hypoechoic. Right lobe (17 dap, t9 dt), isthmus: 2.9, since the lobe (15 dap, dt 15.5).

6 Ultrasound abdomen and pelvis
Liver with slightly increased volume, with mild heterogeneity of the small hypoechoic echostructural wing. Cava vein, portal vein and the design of the hepatic veins are normal. Small Paraport caval lymph nodes (max. 20 mm). Alitiasica distended gallbladder. Normal bile ducts. Right kidney (10 cm, cortical 18 mm) standard. Normal pancreas. Aorta (dap 13.9 mm) and renal arteries flowmetry are normal. Normal spleen (11.7 cm). Left Kidney 104 mm, 19 mm cortical) normal. Depleted non-navigable bladder. Prostate dt 35 mmx40 mm normal.

7 Esophago-gastro-duodenoscopy (EGDS)
Esophagus of normal caliber. The mucosa of the third distal of the esophagus was hyperemic with isolated longitudinal non-confluent erosions. Small sliding hiatal hernia. Modest secondary gastro-esophageal reflux.

Stomach-duodenum: normal. Biopsy was negative for eosinophilic gastroenteropathy.

The following table (Table 1) describes the values of eosinophilia in the follow-up:
Table 1 The values of eosinophilia

| Date               | Eosinophilic cell/100 | WBC/000/mm³ | Eosinophilia /mm³ |
|--------------------|-----------------------|-------------|-------------------|
| During parasites contact |                       |             |                   |
| 30.6.2010          | 66,6                  | 25,14       | 16,743            |
| 13.7.2010          | 12,3                  | 10,26       | 892,98            |
| 24.8.2010          | 9,8                   | 9,13        | 671,54            |
| Stopped parasites contact |                 |           |                   |
| 2.9.2010           | 8,3                   | 8,85        | 568,53            |
| 25.9.2010          | 6,1                   | 7,04        | 429,44            |
| 5.10.2010          | 6,8                   | 5,99        | 407,32            |
| 29.11.2010         | 5,2                   | 5,35        | 278,20            |
| 19.03.2011         | 5,1                   | 5,15        | 269,60            |
| 16.06.2011         | 5,4                   | 5,67        | 281,30            |

As we know, hypereosinophilia is due to Parasitic infestations, allergies, skin diseases, blood diseases, infectious diseases, various diseases, consequences of radiation therapy in high doses (Faulde et al., 2003). In our research, we have analyzed some factors that probably are the origin of hypereosinophilia.

As specific diagnostic tests were negative, we have rejected the parasitological involvement: Trichinella spiralis (that causes muscle pains) and Anisakis spp. (nematelminta that leads hypereosinophilia).

We have recognized the absence of disease from various districts of the organism. The diagnostic orientation was strictly guided by epidemiological and anamnestic considerations.

Patient said that he worked in places where there were a lot of old papers before the symptoms appeared (May, 2010). He used to come into contact with old documents and papers that he had to check and store.

It is to be excluded the practice of actions such as to produce micro-trauma that may be responsible for clinical symptoms. The patient works on cataloging, recording and storing documents and books organized them in shelves. By case-history is also ruled out a use of video terminals repeated and excessive to induce a bilateral tendinopathy.

It is well recognized that it is easy to find parasites in papers, especially if they are adequately stored and not periodically controlled such as lighting and ventilation.

It is known that some insects and some arthropods may be the cause of pathological problems for humans.

In our case, parasites of paper were responsible and may give rise to allergic phenomena.

Thus, our research has considered the role of parasites of paper that cause not only damage to library collections but also can be the origin of human disease.

In the considered situation, the main feature of the insects is represented by their buccal apparatus, made up of long coiled proboscis, which can be lapping or sucking (Tremblay, 1981; Staniczek, 2000).

The insects that are responsible of the parasitology of the paper document are attributable to this group (Table 2).

Table 2 The insects that are responsible of the parasitology of the paper document are attributable to this group

| Taxonomic category | Scientific name | Common name                        |
|--------------------|----------------|------------------------------------|
| Phylum             | Arthropoda     | Arthropods                         |
| Class              | Insecta        | Insects                            |
| Order              | Psocoptera     | Psocids, barklice, & booklice      |

The insects that belong to the PSOCOPTERA order can be often found in library collections and libraries and they have a buccal apparatus. Moreover, if there are a lot of insects, they can lead to pathological events (irritation) on the skin of scholars, workers at libraries etc.

Other insects that frequently can be found in the paper are those that belong to the Thysanura (Table 3) order and among these Lepisma L. saccharina (Remington, 1954).

Table 3 Other insects that frequently can be found in the paper are those that belong to the Thysanura order and among these Lepisma L. saccharina.

| Taxonomic category | Scientific name | Common name                        |
|--------------------|----------------|------------------------------------|
| Phylum             | Arthropoda     | Arthropods                         |
| Class              | Insecta        | Insects                            |
| Order              | Thysanura      | Silverfish, bristletail, & firebrat |
The Thysanura use paper, adhesives, thread, textile fibers and cause superficial injury of irregular outline. They have eleven abdominal segments and their abdomen ends with three long appendices (Berg and Schmidt, 1996).

Other insects that live on paper and adhesives, which causes superficial alterations and small erosions on the skin, are those that belong to the CORRODENTIA order.

8 Discussion

Current literature does not report cases of tendonitis due to contact with parasites. Instead it is known that microtrauma tendonitis can be caused in working activities. Little and repetitive stress injuries, arising from high repetition movements in work, may cause myositis, tendinitis and bursitis.

Tendonitis is an irritation which start from “peritenon”, often caused by overuse in manual workers or in people using upper limb in repetitive movements for accuracy.

These conditions cause fibrosis of tendon sheaths in a progressive stage with ischemia and constriction of the tendon. Histopathology changes include chronic tendon suffering, represented by disorganization and discontinuity of collagen fibers, mucoid degeneration of the extracellular matrix, chondroid metaplasia of tenocytes and increased cellularity in undo-tendon.

The history of our patient excludes working etiology. In physical examination are not stenosing tenosynovitis and canalicular syndromes of the upper limbs. Tendonitis of flexor tendons of fourth finger was confirmed by ultrasonography and hypereosinophilia is the only pathogenic sign remained.

On the basis of our study, we believe that paper parasites are the cause of such rare phenomena. The proof of our thesis is the finding of some “Psocoptera” parasites in the place where our patient worked (Figure 2).

Beside symptoms disappeared when the patient has changed his job; the follow-up ultrasound examination shows the remission of the inflammatory process and tissue damage two mounts after (Figure 3).

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