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International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Osteoid osteoma of the wrist misdiagnosed as de Quervain's tenosynovitis due to normal X-ray at the first visit: A case report

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ARTICLE INFO

Article history:

Received 26 August 2020
 Received in revised form
 19 September 2020
 Accepted 19 September 2020
 Available online 23 September 2020

Keywords:

Osteoid osteoma
 de Quervain's tenosynovitis
 Radius
 Bone tumor
 Wrist pain

ABSTRACT

INTRODUCTION: Osteoid osteomas are benign bone tumors that can occur in various bones throughout the body but are mainly found in the long bones.

PRESENTATION OF THE CASE: We report the case of a patient who had been treated for more than three years for a case of de Quervain's tenosynovitis due to tenderness in the first compartment of the right wrist joint. An X-ray on his first visit to a clinic was normal, but it was eventually discovered that he had an osteoid osteoma of the wrist.

DISCUSSION: The age of onset and gender proclivity of each disease should be considered. An X-ray should be taken in cases such as this, even to diagnose tendonitis. When any symptom, such as pain, has lingered for a long time and resisted treatment, we must reconsider the diagnosis. In patients with a low risk of tendonitis, it is essential to consider the possibility of other diseases if there is no improvement after treatment. As this patient's tumor was missed on the initial X-ray, it grew to a mature case of osteoid osteoma in three years.

CONCLUSION: We experienced a very educational case of osteoid osteoma of the wrist misdiagnosed as de Quervain's tenosynovitis.

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1. Introduction

Osteoid osteomas are benign bone tumors that can occur in various bones throughout the body but are mainly found in the long bones.

The main symptom is severe, localized, spontaneous pain which is especially worse at night. The cause of the pain is thought to be the production of prostaglandins in a nidus.

Osteoid osteomas can occur at any age but are most common in adults younger than 30 years [1]. Males are affected approximately three times more often than females. We report the case of a patient who had been treated for more than three years for de Quervain's tenosynovitis due to tenderness in the first compartment of the wrist joint. Although an initial X-ray appeared normal, a follow-up X-ray eventually showed an osteoid osteoma of the wrist.

Informed consent for publication was obtained from the patient. This case has been reported in line with the SCARE criteria [2].

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<https://doi.org/10.1016/j.ijscr.2020.09.138>

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2. Presentation of case

A 27-year-old man visited an orthopedic clinic because of pain in his right wrist. Tenderness and swelling of the first compartment of the wrist joint was observed. After confirming that there were no major problems on X-ray (Fig. 1), he was diagnosed with de Quervain's tenosynovitis, and nonsteroidal anti-inflammatory drugs were prescribed to control the pain. Three years after onset, there was still no decrease in the pain. He was referred to the orthopedic department of a general hospital for tenosynovitis surgery. A new wrist X-ray revealed a bone tumor (Fig. 2). Computerized tomography (CT) and magnetic resonance imaging (MRI) were also performed (Figs. 3 and 4), both of which confirmed the presence of the tumor.

The patient was referred to the department of hand surgery of our university hospital. The patient's pain numeric rating scale score was 8 points (0 = no pain at all, 10 = worst pain imaginable). We diagnosed that the patient had an osteoid osteoma of the radius with a nidus and central mineralization and subsequently planned for resection surgery. Percutaneous ablation was not considered a viable option because the radial nerve was located directly over the tumor. The operation was performed under an axillary nerve block. A skin incision was made from the radial side of the wrist joint to protect the superficial branch of the radial nerve. The first

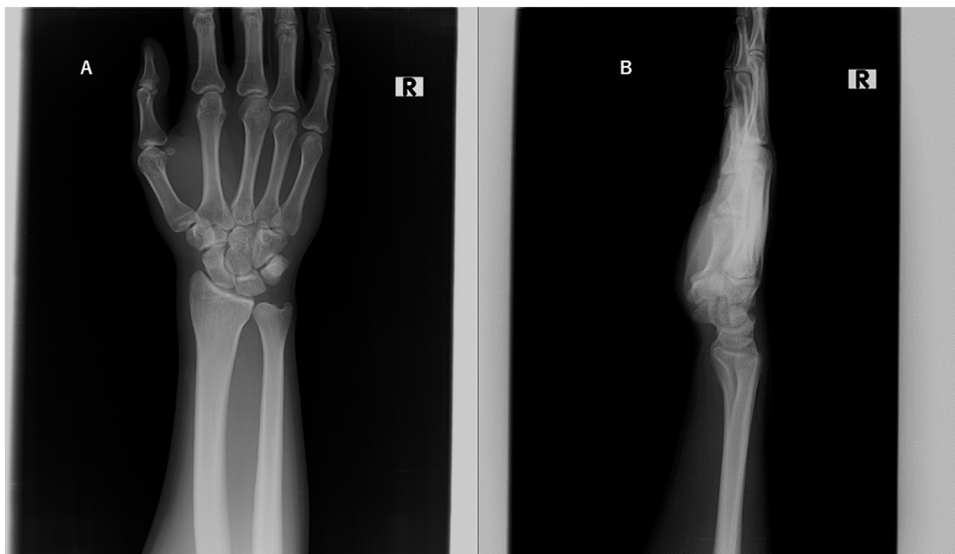


Fig. 1. Normal X-ray of the right wrist at the first visit to the clinic.

A: frontal view.

B: lateral view.

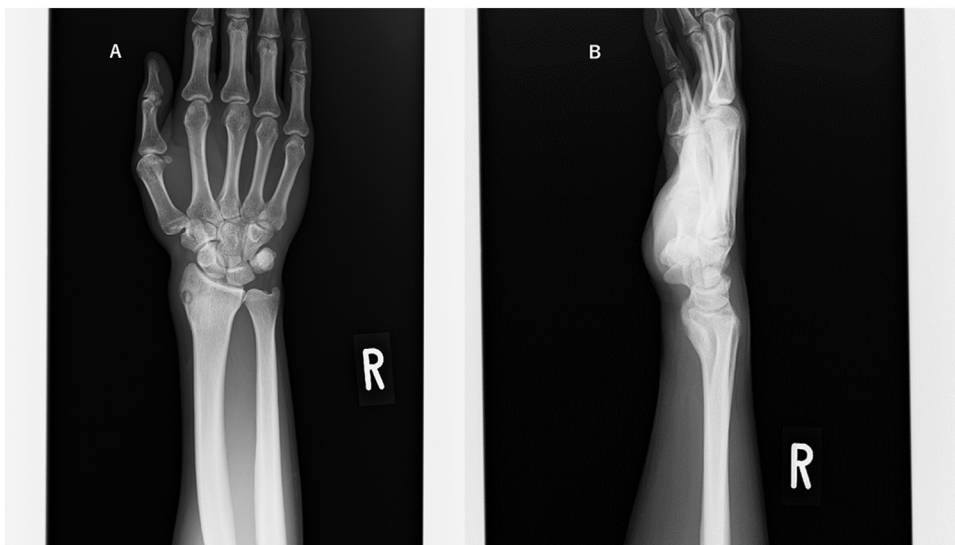


Fig. 2. X-ray of the right wrist with a nidus and central mineralization at the second general hospital.

A: frontal view.

B: lateral view.

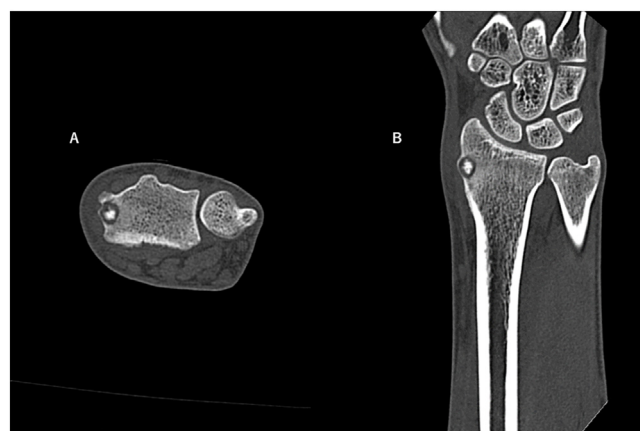


Fig. 3. Computed tomography of the right wrist with a nidus and central mineralization.

A: axial view.

B: coronal view.



Fig. 4. Magnetic resonance imaging of the right wrist.

A: The T2-weighted coronal view.

B: The T1-weighted coronal view.

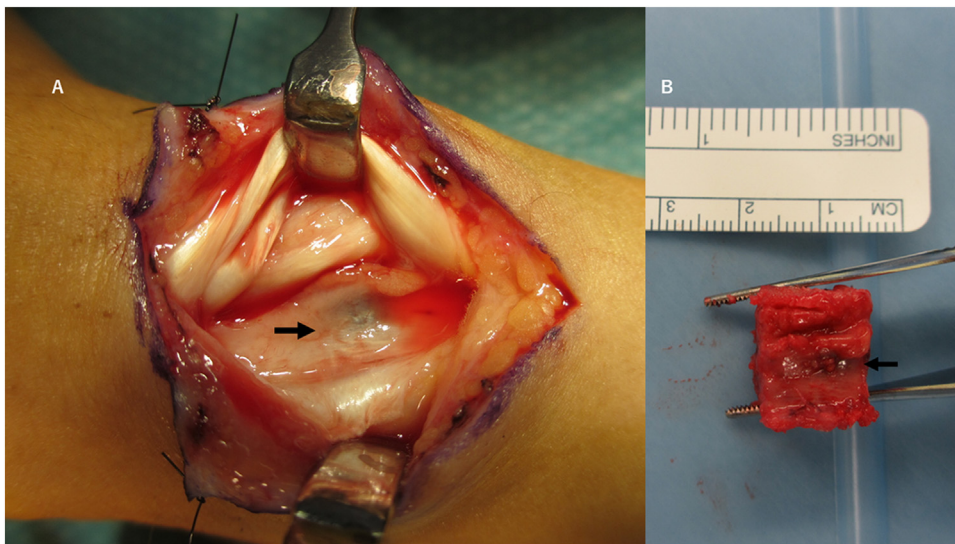


Fig. 5. Image of the surgical procedure.

A: tumor in the radius (black arrow).

B: tumor in the resected bone block (black arrow).

dorsal compartment was released, and the location of the radius bone was confirmed. The bone tumor was identifiable because of the differences in the color tones between it and the surrounding tissue (Fig. 5A). An en bloc resection was performed (Fig. 5B), and the bone defect was filled with beta-tricalcium phosphate.

A pathological examination confirmed the diagnosis of osteoid osteoma. The examination revealed a tumor of approximately 7 mm with conspicuous ossification found in the well-formed woven bone and interconnected trabeculae with numerous osteoblasts.

The patient-rated outcome measures from the Hand20 questionnaire score improved from 37 (pre-surgery) to 12 (3 months post-surgery) [3,4]. One year after the operation, the patient reported that he had no recurrence of symptoms and no pain.

3. Discussion

We reported the case of a 27-year-old male patient presenting with wrist pain misdiagnosed as de Quervain's tenosynovitis. The misdiagnosis occurred due to a normal initial X-ray, but the correct diagnosis was eventually reached when an osteoid osteoma was

subsequently discovered on a second X-ray image. Osteoid osteomas tend to occur mainly in the long bones and in relatively young adults. There are only a few reports of osteoid osteomas found on or around the wrist joint, [5–8] and reports of radial osteoid osteomas are especially rare [9,10]. When an osteoma occurs in a relatively uncommon location, it is often difficult to diagnose. The lesion is characterized as a well-defined lytic area with a vascularized central nidus surrounded by sclerosis and cortical thickening, as observed on X-ray and CT images. MR imaging usually shows an extensive bone marrow and/or soft tissue edema [11]. CT and MRI imaging are expensive and usually not performed on the first visit. Another drawback of a CT scan is the radiation exposure to the patient [12] and an MRI can be problematic if the patient has metal implants in their body [13,14].

Several diseases cause wrist pain, and it is important to distinguish between them [15–17] before beginning treatment. We must confirm the patient's medical history, perform a thorough physical examination, and be aware of the repercussions of misdiagnosis. In this case, the bone tumor formed at a site where de Quervain's tendinitis is common. Despite an X-ray being taken at the time of

the initial visit, the bone tumor remained undetected. We suspect that not many doctors would order a CT or MRI on the first visit under these circumstances [18].

Three years after the initial visit, the patient requested surgery. Had a fresh X-ray not been taken at the second hospital visit, it is possible that a tendon sheath incision would have been performed.

There were several things we learned from this case. The age of onset and gender proclivity of each disease should be considered. An X-ray should be taken, even if the initial inclination is to diagnose tendonitis. When any symptom, such as pain, has lingered for a long time and resisted treatment, we must reconsider the diagnosis. In patients with a low risk of tendonitis, it is essential to consider the possibility of other diseases if there is no improvement with treatment. Because the tumor was missed on the patient's initial X-ray, it was allowed to grow to a mature osteoid osteoma in the space of three years.

4. Conclusion

We experienced a very educational case of an osteoid osteoma of the wrist misdiagnosed as de Quervain's tenosynovitis.

Declaration of Competing Interest

The authors report no declarations of interest.

Funding

This research did not receive any specific grant from funding.

Ethical approval

The ethical approval was exempted by the institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Conception and design of the study: KI, HH.
Treatment: KI, HY, SK, MY, MT Operation: KI.
Drafting and revising of the article: KI.

Final approval of the version to be submitted: KI, HY, SK, MY, MT, HH.

Registration of research studies

NA.

Guarantor

Katsuyuki Iwatsuki.

Provenance and peer review

Not commissioned, externally peer-reviewed.

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