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Osteoid osteoma in the hand: an evaluation of eight patients

El yerleşimli osteoid osteomlu sekiz olgunun değerlendirilmesi

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Amaç: Nadir görülen bir yerleşim olması nedeniyle, elde osteoid osteom saptanan olgular retrospektif olarak değerlendirildi.

Çalışma planı: El yerleşimli osteoid osteom tanısıyla cerrahi tedavi gören sekiz hasta (5 kadın, 3 erkek; ort. yaş 23; dağılım 13-31) incelendi. Osteoid osteom beş hastada sağ, üç hastada sol elde görüldü. Tüm hastalarda yerleşim yeri proksimal falankslar idi; beş hastada dördüncü parmak, bir hastada birinci parmak, iki hastada ise ikinci ve üçüncü parmak tutulumu görüldü. Beş hasta salisilatlara yanıt veren gece ağrıları şikayetiyle başvurdu. Tanı konana kadar geçen semptom süresi ortalama 20 ay (dağılım 12-36 ay) idi. Hastalar ortalama 38 ay (dağılım 15-86 ay) süreyle izlendi.

Sonuçlar: Dört olgunun tanısı direkt grafiyle kondu. Diğer dört olguda bilgisayarlı tomografi kullanıldı; iki olguda da sintigrafi ve manyetik rezonans görüntülemeye gerek duyuldu. Bilgisayarlı tomografi ile üç olguda intraosseöz yerleşim belirlenirken, bir olguda aşırı sklerozdan dolayı nidus görülemedi. Tüm olgularda eksizyon ve küretaj ile nidus çıkarıldı. Beş olguda küretaj sonrasında spongioz otogreft kullanılarak greftleme yapıldı. İzlem süresi içinde beş olgu tümüyle iyileşti; bir olguda rehabilitasyonla iyileşen komşu eklem sertliği gelişti. Bir olguda ameliyattan sonra bir yıl süren ağrı oldu ve grafilerinde subkortikal skleroz görüldü. Yetersiz eksizyona bağlı olarak ameliyattan 18 ay sonra nüks gelişen bir olguda yeniden eksizyon ve greftleme yapıldı ve tam iyileşme sağlandı.

Çıkarımlar: Elde yerleşim gösteren osteoid osteomun tedavisinde eksizyon, küretaj ve greftleme ile yeterli sonuç elde edilmektedir.

Anahtar sözcükler: Kemik neoplazileri/patoloji/radyografi/cerrahi, tanısal görüntüleme, parmaklar/cerrahi, el, insan, osteom, osteoid/tanı/cerrahi, bilgisayarlı tomografi.

Objectives: We retrospectively evaluated patients with osteoid osteoma localized in the hand, which is a rare location for this lesion.

Methods: Eight patients (5 females, 3 males; mean age 23 years; range 13 to 31 years) underwent surgery for osteoid osteoma localized in the hand. Involvement was in the right hand in five patients, and in the left hand in three patients, being in the proximal phalanges in all the patients. The affected fingers were the fourth in five patients, and the first, second, and third in the remaining three patients, respectively. Five patients presented with pain responsive to salicylates. The mean duration of symptoms before diagnosis was 20 months (range 12 to 36 months) and the mean follow-up was 38 months (range 15 to 86 months).

Results: Direct radiographs enabled the diagnosis in four patients. Computed tomography was utilized in four patients, two of whom required scintigraphy and magnetic resonance imaging. Computed tomography showed intraosseous involvement in three patients, but failed to demonstrate the nidus in one patient due to extreme sclerosis. The nidus was removed with excision and curettage in all the cases, combined with cancellous autografting in five patients. Five patients had complete recovery. One patient had stiffness of the adjacent joints, which responded well to rehabilitation. Plain x-rays showed a subcortical sclerotic zone in one patient who had persistent pain for a year postoperatively. Due to inadequate excision, recurrence occurred in one patient 18 months after surgery; revisional excision and bone grafting were performed, resulting in complete recovery.

Conclusion: Satisfactory results are obtained with excision, curettage, and bone grafting of osteoid osteomas located in the hand.

Key words: Bone neoplasms/pathology/radiography/surgery; diagnostic imaging; fingers/surgery, hand/surgery; osteoma, osteoid/diagnosis/surgery; tomography, X-ray computed.

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Osteoid osteoma is a bone tumor that constitutes about 12% of benign bone neoplasms in young individuals. The rate of this condition in males is three times more than the corresponding rate in females.

Location in more than 50% of the cases is proximal femur and tibia. 30% of the remaining lesions are observed in the spinal column, hand and foot. Clinical findings of osteoid osteoma in the hand, which is a rare location for this lesion, may be observed in many different forms. 'Annular sequestrum' is formed from nidus composed of a small osteoid tissue that is well veined and calcified at different levels and peripheral round radiopacity zone. There are no symptoms that enable diagnosis. Most patients are subjected to many diagnostic and surgical methods due to pain. The condition is diagnosed by clinic, radiography, scintigraphy, computerized tomography (CT), magnetic resonance imaging (MRI) and histopathologic examination (Figures 1a, b).

This study examines the cases diagnosed as osteoid osteoma in the hand and treated with surgery.

Patients and method

Bone pathologies in tumor archieve of our clinic for the years 1986-2003 were examined retrospectively and eight patients (5 females, 3 males; mean age 23 years; range 13 to 31 years) with osteoid osteoma in the hand were included in the study. Involvement was in the right hand in five patients and in the left hand in three patients.

The findings obtained by pathology, direct radiography and radiodiagnostic methods (CT, MRI, bone scintigraphy), and the treatments utilized and the results of these treatments were examined from files of the patients (Table 1). The mean follow up was 38 months (range 15 to 86 months).

Results

Osteoid osteoma was located in the proximal phalanges in all of the patients. The affected fingers were the fourth in five patients, and the first in one patient, and the second and the third in two patients. The mean duration of symptoms before diagnosis was 20 months (rage 12 to 36 months). Pain and swelling were the most common complaints; six patients suffered from pain. Swelling was the prevailing symptom in the other two patients. Four of the patients had trauma history before the symptoms started. Full relief was recorded in three of the five patients who took salicylate due to pain and partial relief was recorded in two of them. The predominant findings in physical examinations were mass or fibrous swelling in the relevant phalanx as well as limitation in movement range of the joint.

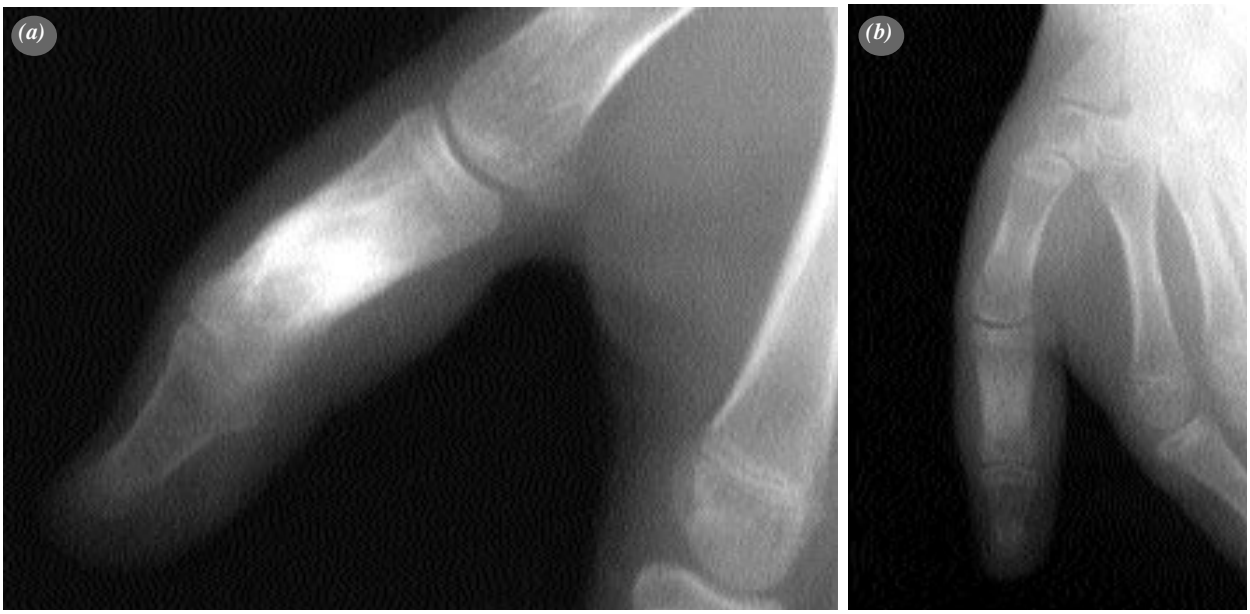

Figure 1. (a) Direct radiograph of a thirteen years old girl. Osteoid osteoma located in the proximal phalanx of the first finger in the left hand. **(b)** Control radiograph of the same patient in the 60th month after surgery (excision and curettage).

Slight erythematous changes that imitate tenosynovitis or infection were observed in two patients. Complete blood count, erytrhrocyte sedimentation rate, Wasserman reaction and Mantoux test in these patients were normal. Other pre-diagnoses considered were Ewing's sarcoma or periosteitis in two cases, tenosynovitis in one cases, osteoblastoma and non-ossified fibroma in two cases. Direct radiographs enabled the diagnosis in four patients. CT was utilized in four patients, two of whom required scintigraphy and MRI. CT showed intraosseous involvement in three patients, but failed to demonstrate the nidus in one patient due to extreme sclerosis.

All of the patients were treated with excision and curettage. Location in all of them was checked with direct radiography during surgery. Bone grafting was used in five patients. Osteoid osteoma diagnosis was confirmed histopathologically in all of the cases.

Five patients had complete recovery without complication. One patient had stiffness of the adjacent joints, which responded well to rehabilitation. One patient had persistent pain for a year postoperatively. Plain x-rays of this patient, who is being followed up for 74 months, showed subcortical sclerotic zone (Figure 2 a-c). Due to inadequate excision, recurrence occurred in one patient 18 months after surgery; revisional excision and bone grafting were performed, resulting in complete recovery without pain.

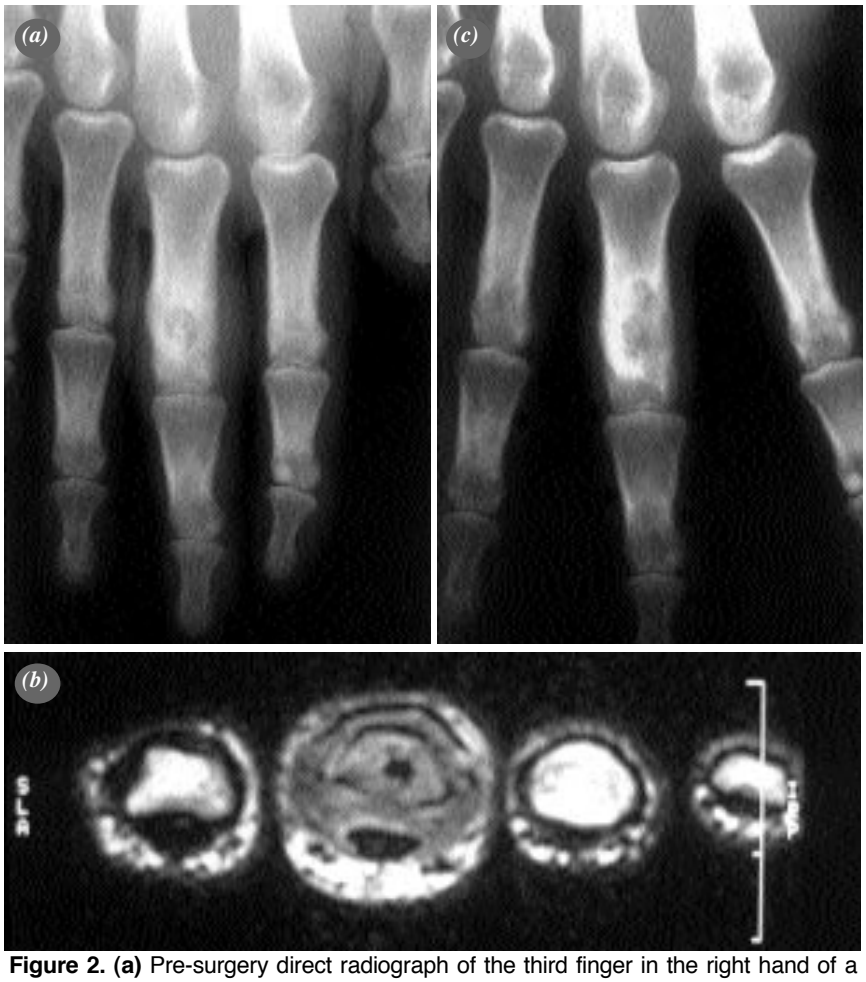

Figure 2. (a) Pre-surgery direct radiograph of the third finger in the right hand of a twenty-eight years old male showing localization in the proximal phalanx. **(b)** Pre-surgery magnetic resonance image of the lesion. **(c)** Direct radiograph of the patient obtained in the ninth month after surgery (excision, curettage, autografting).

Conclusion

In the retrospective investigation, 142 cases, which were diagnosed as osteoid osteoma and treated in our clinic between the years 1986 and 2003, were detected. Lesion was located in the upper extremity in 17 patients (12%) and it was located in hand in 8 patients (5.6%). Within all lesions localized in the upper extremity, percentage of the lesions localized in the hand was 47%. Within all bone neoplasms scanned in this study, percentage of osteoid osteoma in the hand was 0.36% and within all benign bone pathologies, it was 0.49%.

Osteoid osteoma, which is a tumor of growing skeleton, causes pain especially at nights. However, it should be noted that there may be cases without pain.

The study of Bednar et al., which includes the broadest series for osteoid osteoma located in upper extremity, informs female-male ratio as 1/3 and mean age as 20. In our study, female-male ratio was detected as 1.6/1, and mean age as 23. In various studies, rate of osteoid osteoma in the upper extremity was informed as 19%, 21%, 31%, and cases in the hand as 6% and 13%. In retrospective investigation, osteoid osteoma cases in

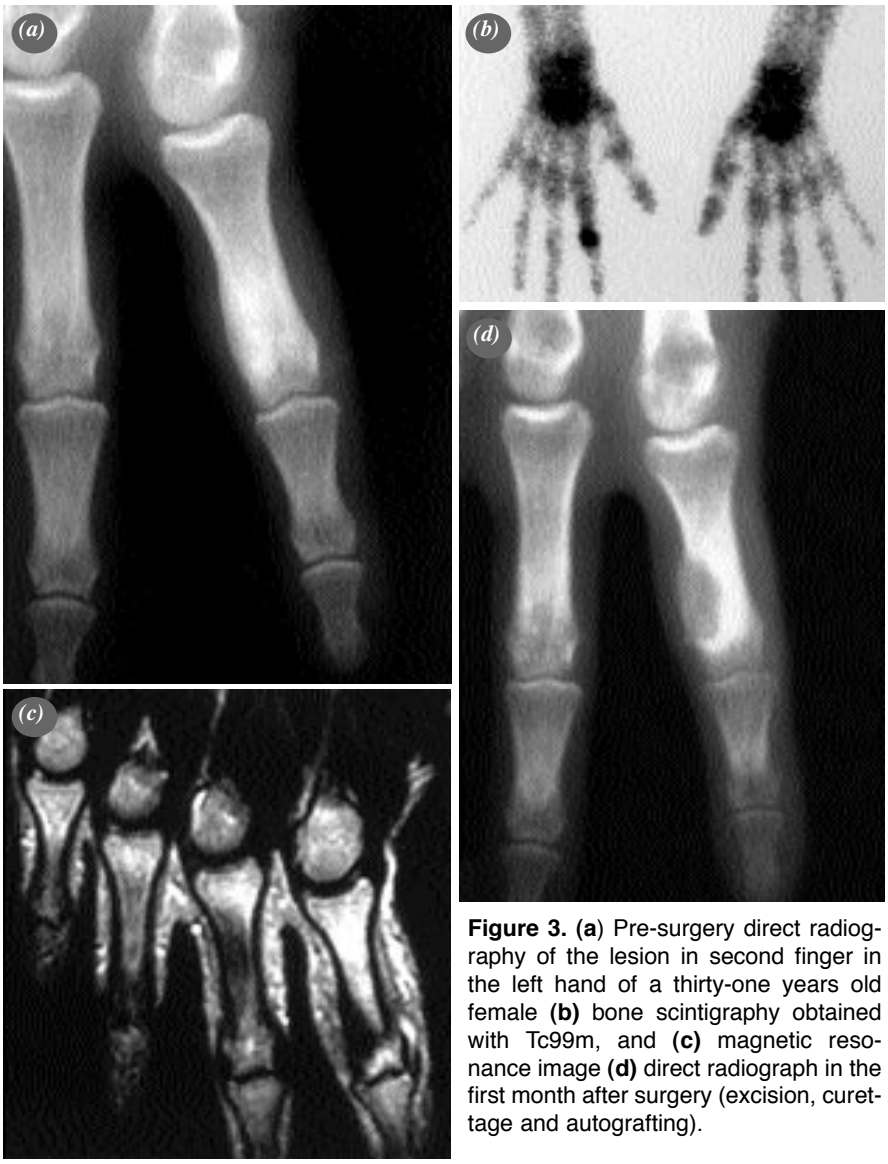

Figure 3. (**a**) Pre-surgery direct radiography of the lesion in second finger in the left hand of a thirty-one years old female **(b)** bone scintigraphy obtained with Tc99m, and **(c)** magnetic resonance image **(d)** direct radiograph in the first month after surgery (excision, curettage and autografting).

the upper extremity were found as 12% and the cases in the hand were found as 5.6%. Within the cases in the upper extremity, percent of the cases in the hand was 47%.

The most common location of tumor in the hand is the proximal phalanges. This location was observed in all of our cases. The mean duration of symptoms, which was 20 months before diagnosis (range 12 to 36 months), may be accepted as a long period. The most important reason of the delays in diagnoses was the patients who did not give sufficient attention to swelling without pain. Three patients applied to our clinic with the complaint of swelling without pain and slight limitation in movements. In one of these patients, it was learned that pain occurred within the three months period before diagnosis. Clinical findings in two patients resembled an infectious condition; one of the patients had applied after being treated with tenosynovitis diagnosis in another health center (Figure 3 a-d). There was no anomaly in his routine blood tests. CT showed nidus in only one patient. Osteoid osteoma in the other patient was diagnosed with histopathological examination. In the two cases without pain, there was trauma history as well as slight limitation in the proximal interphalangeal joint movements without symptoms.

The patients who used aspirin informed replied reaching 73%. Three (60%) of the five patients who use salicylate due to pain have full relief and two (40%) of them have partial relief.

In all of the patients, there was swelling and mass detectable by palpation. This condition was caused by subcutaneous location of bones in the hand. Prostaglandin E2 and prostacyclin available in high levels were considered responsible for pain, reactive sclerosis and changes related to inflammation. Also it was shown that main metabolites of prostacyclin in osteoid osteoma was excreted with urine and this restored to normal after excision of nidus.

Direct radiographs enabled the diagnosis in four of the eight patients. It had been informed that 25% of the cases were not seen in direct radiography. Cortical structure of the phalanges reduces quality of direct radiographs; this condition was observed in our cases. CT was used as the second diagnostic method in four cases. Bone scintigraphy and MRI was used in two cases. CT and MRI were used for both diagnostic purposes and in order to determine actual locations.

The two important problems related to osteoid osteoma in the hand are clinical progress and the difficulty of diagnosing by depending radiological results. Even though, pain is the main complaint, it should be noted that osteoid osteoma in the hand may be without pain. In some cases, pain may be the only symptom and morphological pathology of bone structure may not be seen in direct radiography and CT; and pain treatment may be applied for these cases by mistake. Erythema and fibrous swelling may sometimes direct clinicians to consider tenosynovitis, spinoventoza and other septic conditions; also distinguishing diagnosis should be made with stress fracture, intracortical abscess, Garre's syclerozan, osteomyelitis, intracortical hemangioma and very rarely intracortical osteosarcoma and Ewing's sarcoma since they have similar characteristics. Even though there are characteristic clinical findings in some cases, nidus may not be shown even in surgery or pathological examinations. Another problem is the resistive lesions localized in the hand in a high rate. Similar to one of our cases, this condition is considered as related to insufficient resection. Long-term bone pain and non-specific radiological findings should direct clinician to consider osteoid osteoma. Since etiology cannot be explained in the patients below forty years of age, pain reply received with non-steroid anti-inflammatory drugs should be definitely asked. Direct radiographs should be evaluated well in terms of osteoid osteoma and CT should be used for adequate excision.

References

1. Goldberg VM, Jacobs B. Osteoid osteoma of the hip in children. Clin Orthop 1975;(106):41-7.
2. Schajowicz F. Bone forming tumors, osteoid osteoma and osteoblastoma. In: Tumors and tumor-like lesions of bone and joints. 1st ed. New York: Springer- Verlag; 1981. p. 34-47.
3. Dahlin DC. Osteoid osteoma. In: Unni KK, Dahlin DC, editors. Dahlin's bone tumors: general aspects and data on 11.087 cases. 5th ed. Philadelphia: Lippincott-Raven; 1996. p. 121-30.
4. Dorfman HD. Benign osteoblastic tumors. In: Dorfman HD, Czerniak B, editors. Bone tumors. 1st ed. St. Louis: Mosby;

1998. p. 85-103.
5. Kransdorf MJ, Stull MA, Gilkey FW, Moser RP Jr. Osteoid osteoma. Radiographics 1991;11:671-96.
6. Resnick D. Tumor and tumor like lesions of bone. In: Bone and joint imaging. 2nd ed. Vol. 2, New York: W. B. Saunders; 1992. p. 1107-13.
7. Marcove RC. Cyst formation and benign-malign bone tumors. In: Marcove RC, Arlen M, editors. Atlas of bone pathology with clinical and radiographic correlations. 1st ed. Philadelphia: Lippincott Williams & Wilkins; 1992. p. 300-18.
8. Bednar MS, McCormack RR Jr, Glasser D, Weiland AJ. Osteoid osteoma of the upper extremity. J Hand Surg [Am] 1993;18:1019-25.
9. Fehring TK, Green NE. Negative radionuclide scan in osteoid osteoma: a case report. Clin Orthop 1984;(185):245-9.
10. Wold LE, McLeod RA, Sim FH, Unni KK, editors. Atlas of orthopaedic pathology. Philadelphia: W. B. Saunders; 1990.
11. Healey JH, Ghelman B. Osteoid osteoma and osteoblastoma: current concepts and recent advances. Clin Orthop 1986; (204):76-85.
12. Swee RG, McLeod RA, Beabout JW. Osteoid osteoma: detection, diagnosis and localization. Radiology 1979; 130:117-23.
13. Basu S, Basu P, Dowell JK. Painless osteoid osteoma in a metacarpal. J Hand Surg [Br] 1999;24:133-4.
14. Rex C, Jacobs L, Nur Z. Painless osteoid osteoma of the middle phalanx. J Hand Surg [Br] 1997;22:798-800.
15. Hartmann T, Preis C, Gabriel A, Rath T, Ilias W. An osteoid osteoma as an undiagnosed cause of three years of severe pain. Anesth Analg 1997;85:1344-5.
16. Soler JM, Piza G, Aliaga F. Special characteristics of osteoid osteoma in the proximal phalanx. J Hand Surg [Br] 1997;22: 793-7.
17. Huvos AG. Bone forming tumors-benign: osteoid osteoma. In: Bone tumors, diagnosis, treatment and prognosis. 2nd ed. Philadelphia: W. B. Saunders; 1991. p. 49-66.