

## Proksimal Femur Osteoid Osteoma Tedavisinde; Bt Eşliğinde Drilleme mi Yoksa Eksizyon mu?

### Proximal Femur Osteoid Osteoma Treatment: Ct Guided Drilling or Excision?

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#### Öz

**Amaç:** Bu çalışmanın amacı; BT kılavuzluğunda mini açık eksizyon, perkütan drilleme veya skopi kılavuzluğunda eksizyon ile tedavi edilen proksimal femur osteoid osteomu olan 16 hastanın sonuçlarını bildirmektir.

**Yöntem:** Cerrahi tedavi uygulanan (7 BT kılavuzluğunda mini açık eksizyon, 6 BT kılavuzluğunda perkütan drilleme, 3 skopi kılavuzluğunda mini açık eksizyon) ve ardından en az bir yıl takip edilen 16 hasta değerlendirildi. Ameliyat öncesi ve son takipteki VAS ağrı skorlaması ile hasta memnuniyetinin derecesi (0-10 puan) veya seviyesi (1 'yüksek' - 4 'kötü') analiz edildi.

**Bulgular:** Ameliyat sonrası ortalama VAS ağrı skoru (0.7±1.1), ameliyat öncesi değerlere (8±1) göre daha düşüktü (p: 0.0004). Ortalama seviye ve memnuniyet puanı 1,3±0,6 ve 8±2 puandı. Herhangi bir parametre için BT kılavuzluğunda mini açık eksizyon veya BT kılavuzluğunda perkütan drilleme arasında fark bulunmadı. İzlemede herhangi bir nüks veya majör komplikasyon görülmedi.

**Sonuç:** BT kılavuzluğunda eksizyon grubunda lezyonun histolojik doğrulanması daha belirgin olmasına rağmen, her iki grupta semptom nüksü veya majör komplikasyon olmaksızın tüm hastalarda benzer ağrı rahatlaması ve yüksek memnuniyet görüldü.

**Anahtar Kelimeler:** Osteoid osteom, BT eşliğinde drilleme, Proksimal femur

#### ABSTRACT

**Objective:** This study aims to report the results of 16 patients having proximal femur osteoid osteoma who were treated with CT guided mini-open excision, drilling, or x-ray guided excision

**Method:** 16 patients receiving surgical treatment (7 CT guided mini-open excision, 6 CT guided percutaneous drilling, 3 Scopy guided mini-open excision) who were followed for at least one year were evaluated. Preoperative and latest follow-up VAS pain scoring and degree (0-10 point) or level (1 'high to 4 'worse') of patient satisfaction were analyzed.

**Results:** Mean postoperative VAS pain score (0.7±1.1) was lower compared to pre-operative values (8±1) (p: 0.0004). The mean level and point of satisfaction were 1.3±0.6 and 8±2 points. There was no difference between CT-guided mini-open excision or Ct-guided percutaneous drilling for any parameter. There was not any recurrence or major complication during follow-up.

**Conclusion:** Although histological verification of the lesion was more obvious in the CT-guided excision group, both groups resulted in similar relief of pain and high satisfaction at all patients with no recurrence of symptoms or major complications.

**Keywords:** Osteoid osteoma, CT guided drilling, Proximal femur

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## INTRODUCTION

Osteoid osteoma is a benign, painful, and well-localized bone tumor. Pain is often worse at night, and it can be relieved by salicylates. The most common anatomic sites of this tumor are the femur and the tibia, with up to %40 occurring at the proximal femur.<sup>1,2</sup> The natural history of osteoid osteoma is self-limiting. However, with increasing pain especially at night time, many patients seek definitive treatment, traditionally achieved by open surgical resection of the nidus and the sclerotic reactive bone. Still, the main difficulty both with this technique and newer techniques is the intraoperative identification of the nidus, resulting in targeting error thus incomplete resection of the tumor and later recurrence of symptoms.<sup>1-3</sup>

Depending on this, CT-guided percutaneous drilling has been described in the late 90s to localize nidus precisely however this still has the chance of targeting error resulting in clinical failure.<sup>2,4,5</sup> Most recently CT guided percutaneous drilling combined with radiofrequency thermoablation (RF) has been described.<sup>3</sup> However main concerns are the cost of the procedure, need for special instruments, possible thermal damage to surrounding tissues and finally questions about improved effectiveness over CT guided percutaneous drilling.<sup>6,7</sup>

The purpose of the present study is to report the results of 16 patients having proximal femur osteoid osteoma who were treated with CT-guided mini-open excision or drilling or x-ray guided excision with a minimum follow-up of one year. The hypothesis is that CT-guided mini-open excision would lead to

lower pain, and higher satisfaction scores due to the least possible risk of recurrence.

## PATIENTS AND METHODS

17 patients who were having osteoid osteoma of the proximal femur participated in this study (<sup>12</sup>: femur neck, 2: lesser trochanter, 2: greater trochanter, 1: subtrochanteric). The diagnosis was made depending on the specific and radiological features. There were 5 female, 12 male patients. The mean age of the patients was 21±11 years. All patients had at least one-year follow-up (mean 71±62 months). 16 patients received surgical treatment (7; CT guided mini-open excision, 6; CT guided percutaneous drilling, 3; Scopy guided mini-open excision) and 1 patient refused surgery and followed conservatively. Preoperative and latest follow-up VAS pain scoring and degree or level of patient satisfaction (points: 0; 'unsatisfied-10 points; 'maximum satisfaction' and level: 1. highly satisfied, 2. partial, 3. not satisfied. 4. worse) were recorded.

### Surgical technique

For CT-guided drilling or mini-open excision, after sedative anesthesia, CT examination is performed first and the best CT section of the nidus is marked on the skin (Figure 1). After sterile preparation, K wire is inserted through this mark (anterior or lateral), and CT examination was repeated to confirm the tract of K wire towards the nidus. Then, the patient got transferred to the operating theater, and the lesion was drilled over the K wire or excised with mini-open exposure (3-4cm incision, k wire in the middle of the incision). Scopy guided excision was reserved for patients that nidus could be easily localized using scopy.

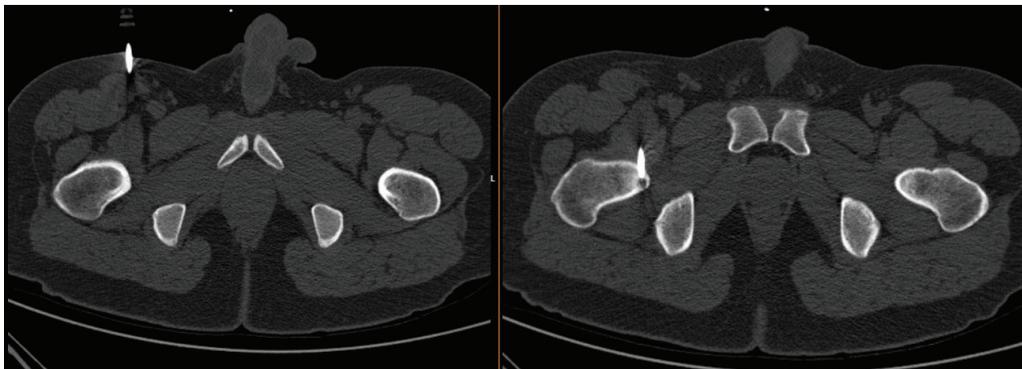


Figure 1

## Statistical analysis

Data analysis was performed using SPSS for Windows, version 22 (IBM, SPSS statistics). A value of  $p < 0.05$  was considered statistically significant. Mann-Whitney tests were used to compare groups for the variables. Wilcoxon signed-rank test was used to compare preoperative VAS to postoperative VAS scores.

## RESULTS

8 patients had confirmation of diagnosis on histological examination (5; CT guided open excision, 2; CT guided percutaneous drilling, 1; Scopy guided open excision). 11 lesions were treated through lateral, 5 lesions through the anterior approach.

Mean postoperative VAS pains score ( $0.7 \pm 1.1$ ) was lower compared to preoperative values ( $8 \pm 1$ ) ( $p: 0.0004$ ). The mean level and point of satisfaction were  $1.3 \pm 0.6$  and  $8 \pm 2$  points.

Mean preoperative VAS ( $8$  vs  $8 \pm 1$ ), postoperative VAS scores ( $0$  vs  $0.8$ ), satisfaction level ( $1.5$  vs  $1.2$ ), and points ( $8$  vs  $8 \pm 2$ ) were not different between CT guided drilling vs CT guided mini-open excision groups ( $p > 0.05$ ). Scopy guided group could not be included in group comparison due to the low number of patients.

There were not any recurrence or major complications like fracture, infection, or neurovascular injury except for one hematoma in a patient which was resolved by compression dressing and close follow-up.

## DISCUSSION

Radiofrequency ablation (RF) is considered the gold standard procedure for percutaneous treatment of osteoid osteoma,<sup>8,9</sup> with a similar success rate compared to CT-guided percutaneous resection drilling (98% vs 91%).<sup>10</sup> However still have the chance of recurrence,<sup>11,12</sup> and the complications that are not considerably few including the ones related to the technique itself, like skin burns and infections.<sup>13</sup> Still the most important factor is to reach the nidus precisely intraoperatively.<sup>9</sup> To overcome this issue and the radiation exposure during CT guidance, newer

techniques like 3D navigation guided RF, magnetic resonance-guided focused ultrasound surgery, or hip-arthroscopy assisted excision have been described.<sup>8,14,15</sup>

The main finding of the present study was CT guided percutaneous drilling or excision resulted in similar improvement of pain, satisfaction with no report of recurrence or complication. The only significant difference was histological verification of the lesion was more obvious in the excision group.

The hypothesis was CT guided excision would result in better results compared to drilling. This was based upon targeting errors still reported in the literature,<sup>2,4,5</sup> possibly secondary to hard sclerotic rim surrounding the nidus leading to guidewire passing tangent to or grazing the nidus leading to incomplete removal. This could be overcome by CT-guided mini open-excision by verification of hard sclerotic rim surrounding nidus marked with K wire at an excised surgical specimen. This hypothesis was not proven completely although the histological diagnosis was more frequent in the excision group. This was possibly due to short term follow-up and the low number of cases in each group. Although recurrences mostly seem to occur within the postoperative first year,<sup>11,16,17</sup> later recurrences are also reported.<sup>3</sup>

There are certain limits of this study. First, this is a retrospective study of a limited number of patients. The number of patients in each group was not enough to confirm the hypothesis. Second, surgeries were not performed by a single surgeon. There was no control group (e.g: conservative treatment) to confirm the effectiveness of the procedures applied. The last, patient-reported subjective VAS and satisfaction scores were given instead of objective functional scores and/or strength tests.

To conclude, CT-guided percutaneous drilling or CT or scopy guided mini-open excision resulted in relief of pain and high satisfaction at all patients with no recurrence of symptoms or major complications at a mean follow-up of 5 years (min 1 year). CT guided drilling or mini-open excision yielded no difference in terms of pain relief or the degree of patient satisfaction.

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