

# Relation Between Two Bone Tumors of Spine

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## Abstract

Osteoid osteoma and osteoblastoma are rare primary bone tumors that usually do not arise in the spine. Histologically, osteoid osteoma and osteoblastoma are similar, containing osteoblasts that produce osteoid and woven bone. Osteoblastoma, however, is larger, tends to be more aggressive, and can undergo malignant transformation, whereas osteoid osteoma is small, benign, and self-limited. With the help of modern imaging modalities that aid in diagnosis and surgical planning, a complete removal and cure may be achieved for most of these rare tumors. We document a brief review of the literature.

**Keywords:** Tumors; Spine

## Introduction

In Jaffe [1] described a new bone lesion, which he named osteoid osteoma. This entity arose in spongy bone and was less than 2 cm in diameter. Jaffe was the first to identify and describe osteoid osteoma of the spine. In Jaffe [2] and Lichtenstein [3] independently proposed the term benign osteoblastoma. Osteoid osteoma and osteoblastoma are bone-producing lesions that are frequently localized in long bones and posterior elements of the vertebra. The most common presenting symptom is pain. Osteoblastoma and osteoid osteoma are histologically similar in many regards. The basic microscopic pattern in osteoblastoma and osteoid osteoma is bone-forming tumor containing numerous osteoblasts producing osteoid and woven bone. In comparison to osteoid osteoma, osteoblastoma has more aggressive characteristics and often forms extra skeletal bone in the soft tissue. There have been several large series reporting on osteoid osteoma and osteoblastoma of the spine [1,12,13,16,17]. However, the reports included information on patients who did not have surgery [12,16,17] or numerous patients who were treated before 1960 [1,13]. As several imaging techniques have been developed during the last 20 years, the diagnosis in patients can be made earlier in the clinical course and more exact excision possible.

## Pathology

After the first descriptions of osteoid osteoma and osteoblastoma by Jaffe [10,11] and Lichtenstein [15], these rather vascular, osteoid, and bone-forming tumors caught the attention of different authors. Jackson [9], published a review of 860 cases of osteoid osteoma and 184 cases of osteoblastoma collected from the English literature. The spine has been the location of 10% of all osteoid osteoma [1 4,9,23] and 36% of osteoblastoma. These spine tumors arose in the posterior elements. Histologically, osteoid osteoma is small, benign, and self-limited, containing osteoblasts that produce osteoid and woven bone [12]. Both of these tumor types tend to occur in the thoracic and lumbar spine [3,21]. Osteoblastoma occur predominantly in patients younger than 20 years of age [5,10,15]. Clinically, the pain of osteoblastoma is not as severe at night, nor is it relieved by aspirin, as is pain of osteoid osteoma.

## Imaging

In contrast to osteoid osteoma, plain X-ray films are usually sufficient to diagnose osteoblastomas, although CT scans and MR images are of great value for both diagnostic and therapeutic considerations in the spine. Preoperative CT scanning has been shown to be very helpful for precisely defining the location of the

tumor and extent of osseous involvement [8]. Appearance of these tumors on MR images is generally non-specific, but this imaging modality is surely the best to reveal the effects of tumor on the spinal canal and cord, as well as the extensive intra- and extra-osseous reactive changes and the possible infiltration of adjacent soft tissues. The nidus usually has a low-to-intermediate signal intensity on T1-weighted and a low-to-high signal intensity on T2-weighted magnetic resonance (MR) images [2,6,18]. Technetium bone scanning is now accepted as the most accurate means for localizing the tumor [21]. This modality demonstrates an intense focal accumulation of the bone-seeking agent [14,19].

## Treatment

Surgery is the most common treatment for this disease (osteoid osteoma) and the prognosis after total resection is favorable. The recommended treatment for osteoid osteoma causing disabling pain and spinal deformity is excision. The most important determinant for successful removal of the tumor is its exact localization. Osteoid osteomas are most frequently treated because of the persistent pain associated with them, whereas osteoblastomas are treated both for pain and the increase in size, which leads to destruction of bone. Recently, percutaneous radiofrequency thermal ablation [1,7,20,22,24] and laser photocoagulation [25] have been promoted as a minimally invasive treatment for osteoid osteoma located in the spine and extremities. These techniques are both based on thermal necrosis obtained by local temperatures ranging from 50 to 90°C. A drawback of these techniques is the lack of histologic verification of the specimens. In addition, heating the tip of needle up to 90°C for 4-6 min in a nidus located in the posterior structures of the spine inevitably risks thermal damage to the neural structures [6]. The use of these techniques for spinal osteoid osteoma has been reported previously [4,6,7,20,22,24,25] with conflicting results. Hadjipavlou [7] recently reported two patients treated with radiofrequency ablation, of which one had incomplete resection necessitating reoperation. Vandersteen [25] reported recurrent symptoms in two of four cases with spinal osteoid osteoma in a series of 97 patients treated with thermocoagulation.

## Conclusion

In conclusion, we believe that with the development of modern imaging and treatment methods, exact surgical planning has become possible. As several imaging techniques have been developed during the last 20 years, the diagnosis in patients can be made earlier in the clinical course and more exact excision possible.

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**SUNTEXT REVIEWS**

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