Painful Scoliosis Secondary to Posterior Rib Osteoid Osteoma: A Case Report and Review of Literature

Mir Bahram Safari,1 Ali Tabrizi,1* Ebrahim Hassani,2 Hossein Akbari Aghdam,3 and Mohammad Javad Shariyate4
1Assistant Professor of Orthopedics Department, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, IR Iran
2Associated Professor of Anesthesiology, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, IR Iran
3Assistant Professor of Orthopedics, Isfahan University of Medical Sciences, Isfahan, IR Iran
4Residents of Orthopedics Surgery Department, Imam Khomeini Hospital, Urmia University of Medical Sciences, Urmia, IR Iran
*Corresponding author: Ali Tabrizi (MD), Moderres Ave, Emam Khomeini Educational Hospital, Urmia University of Medical Sciences, Urmia, IR Iran. Tel: +98-9143130829, E-mail: ali.tab.ms@gmail.com

1. Introduction

Osteoid Osteoma, which was first described by Jaffe in 1935, is the third common benign bone tumor often observed in long bones. Ribs involvement is very rare. In spinal involvement, it usually can cause painful scoliosis often seen in posterior component of spinal vertebral. A 15-year-old female with painful scoliosis, whose brace treatment was unsuccessful, is presented. In imaging investigations, her CT scan showed lytic lesions in the posterior of the seventh rib. She had a 30-degree painful scoliosis with right concave curve. Posterior part of the rib containing tumoral lesion was removed. Histopathological investigations showed a woven bone. Osteoid Osteoma was confirmed and the patient’s pain was resolved several days after the surgery. Follow-up in 3 month after the surgery showed that the curve of spinal deformity was completely resolved. Rib osteoid osteoma can cause painful scoliosis in young people, and surgical excision can be a successful treatment. It seems that application of brace had no impact on reducing the patient’s symptoms.

Keywords: Osteoid Osteoma, Painful Scoliosis, Surgical Excision

2. Care Report

The patient was a 15-year-old female with a one year painful deviation deformity in spine. According to diagnosis of adolescent idiopathic scoliosis (AIS), she was prescribed with thoracolumbar brace. However, it did not improve the patient’s symptoms, and her deformity and pain were even increased. Her pain increased at night and during rest. She used oral analgesics such as ibuprofen, which completely resolved the pain. When she was examined, it was found that she had deformity in the thoracic spine. No other deformation was seen in other skeletal parts. Development and intelligence were normal. There were no neural or motor disorders. Posteroanterior radiography revealed deformity in thoracic spine in the form of a 30-degree scoliosis with a right curve. There was no compensating curve in the cervical and lumbar spine (Figure 1). There was no disorder in spines, and patient’s symptoms started at the age of 14. Radiographic investigations showed a lesion in the posterior area of the seventh rib. CT scan was also performed for her, which showed a 1-cm lytic lesion with sclerotic margins (Figure 2). Bone scan was also
performed. Rib lesion had high uptake and was completely a hot lesion (Figure 3).

Laboratory tests showed that blood cell count was normal: blood cell count: $7.8 \times 10^6$/mm$^3$; rheumatoid factor = 0; uric acid: 3.9 mg/dL; erythrocyte sedimentation erythrocyte sedimentation: 10 mm/h; and C-reactive protein (CRP 4.5 mg/dL). These findings ruled out infections.

The patient was treated with surgical excision in the posterior of the seventh rib with the length of 4 cm. The entire mass along with the surrounding bones were removed and sent for histopathologic investigations, which showed irregular bony trabeculae within the surrounding vascularized connective tissue, confirming osteoid osteoma. Follow-up examinations 3 months after the surgery revealed a complete improvement of vertebral column deformity; and the patient’s pain was completely resolved (Figure 4).

3. Discussion

Osteoid osteoma should be regarded as the main reason for back and neck pains, painful scoliosis, and radicular and reference pain in young patients (2). Also, osteoid osteoma is one of the main reasons for painful scoliosis in children and teenagers (2). Vertebral column deviation is more profound in supine position rather than standing erect. Scoliosis is generally rigid and induces restriction of spinal motion (4). Backache depends on the site of nidus (2). Posterior rib osteoid osteoma can lead to painful scoliosis in young patients (3). Reports in this regard are very few, but in all of the cases, rib osteoid osteoma and osteoblastoma were the main reasons for painful scoliosis in children and teenagers (3).

In the report by Fabris et al. progressive scoliosis was observed in 2 cases of rib osteoblastoma (5). Also, studies of Mehdian et al. Hoeffel et al. and Lynch et al. reported painful scoliosis in rib osteoid osteoma cases (3, 6, 7). Mehdian et al. reported a 14-year-old female with painful scoliosis and lytic mass in the seventh rib just similar to our patient, who had progressive painful scoliosis in need of excision surgery to remove the tumor (3). Vertebral column deviation occurs due to muscular spasm and inflammatory responses. In the study of Aydinli et al. 5 out of 8 cases of osteoid osteoma (62.7%) had painful scoliosis (8). Pourfeizi et al. reported 63% scoliosis in cases with spinal osteoid osteoma (2). Tumoral lesion may not be diagnosed due to the small size of the lesion and ribs overlap (2). Therefore, painful deviation of vertebral column in teenagers has to be regarded as one of the important differentiating diagnostic factors (2). A computerized tomography (CT) scan is an excellent modality for investigation of painful scoliosis such as our case. Bone scan can also be applied to confirm the diagnosis (2).

In the treatment of ribs and spinal secondary scoliosis resulting in deviational deformity, Spakas et al. proposed a long-term brace treatment (9). However, accepting this treatment is hard for the patients and regarding the painfulness of the deviational deformities, this treatment does not seem successful. In our patient, brace treatment for 1.5 years had no effect in reducing the symptoms and deviation. CT-guided percutaneous radiofrequency ablation is one of the accepted therapeutic methods for osteoid osteoma (10). In study of Hadjipavlou et al. application of percutaneous radiofrequency ablation in 4 patients with osteoid osteoma in L3 and L4 spines and in the head of the 11th rib showed complete recovery in 3 patients with vertebral column involvement, but it failed in 1 patient with 11th rib involvement and surgical excision was needed (4). In osteoid osteoma of the seventh vertebra of our patient, surgical excision resulted in pain relief and resolution of deformity 3 month after the surgery. In other reports of painful scoliosis due to rib osteoid osteoma, surgical excision has been a successful treatment without any adverse effect.

3.1. Conclusions

Rib osteoid osteoma can cause painful scoliosis in young people, and surgical excision could be a successful treatment. Application of brace has no influence on reducing the patient’s symptoms.

Footnotes

Conflicts of Interest: There are no conflicts of interest.

Ethical Issues: The study was confirmed by the ethics committee of Urmia University of Medical Sciences. The patient’s parents completed the consent form to publish this report.

References


Figure 1. Posterior Anterior Radiography Showing The Right Deviation with 30-Degree in the Thoracic Spine
Figure 2. Axial Section of the CT Scan of the Thoracic Spine and the Seventh Rib Indicating Lytic Lesion With Sclerotic Margin in Rib Posterior

Figure 3. Bone Scan With High Uptake and Hot Lesion in the Seventh Rib

Figure 4. Radiography 3 Months After Tumor Excision Surgery, Showing the Resolution of Spinal Deviation