

Role of CT and MRI in Evaluation of Adolescent Painful Scoliosis

Esam M Hemat*MD, Amr El-Adawy** MD.

Radiodiagnosis & Orthopedic Surgery** Departments, Faculty of Medicine, Zagazig University, Egypt.*

Abstract

Background Data: Osteoid osteoma is the most common cause of adolescent painful scoliosis. Although, plain radiography, bone scintigraphy and CT, have important role in its diagnosis, these modalities cause radiation hazards for the patients. MRI is safe, free from ionizing radiation, accurate in evaluation of a young patient with back-pain and scoliosis.

Study Design: This is a prospective study conducted on 12 young patients, presented clinically with a painful scoliosis and referred for CT & MRI examination.

Aim: to evaluate helical CT and MRI findings in adolescent painful scoliosis.

Patients and methods: This study was conducted on 12 adolescent patients, 7 males and 5 females with an age range of 8–18 years, presented with painful scoliosis during the period from May 2011 to April 2014. CT and MRI are done for all patients. Surgery was performed in 11 patients.

Results: Nine patients were diagnosed as osteoid osteoma, two patients diagnosed as osteoblastoma & one patient diagnosed as aneurysmal bone cyst. On CT, a nidus was identified in 9 patients and reactive sclerosis was seen in 10 patients. MRI demonstrated the nidus in 8 patients and unilateral neural arch oedema with anterior extension to involve the ipsilateral posterolateral vertebral body in 9 patients. MRI features were correlated with CT.

Conclusion: The presence of unilateral neural arch oedema extending to involve ipsilateral posterolateral vertebral body in MRI evaluation of adolescent painful scoliosis, raises the possibility of spinal osteoid osteoma, so, CT is recommended to detect the presence of a nidus. (2015ESJ 069)

Keywords: CT, MRI, adolescent scoliosis, nidus.

Introduction

Painful scoliosis is a well-recognized presentation of spinal osteoid osteoma and osteoblastoma and is considered to be secondary to pain-provoked muscle spasm on the side of the lesion.²⁷ Osteoid osteoma of the spine is a relatively rare tumor, which should be included in the differential

diagnosis of any young patient with back pain, scoliosis or pain referred to the lower limb.^{25,26} Prompt diagnosis is important to reduce the duration of symptoms and the risk of structural spinal deformity. The characteristic imaging finding of this benign bony tumor is a radiolucent nidus surrounded by sclerotic, reactive trabecular bone. Osteoid osteomas tend

to occur in young people, ages from 10 to 20 years, with a male to-female ratio of approximately 2:1. The classic clinical symptom is bone pain that is more pronounced nocturnally and usually is relieved with non-steroidal anti-inflammatory drugs (eg, aspirin).²²

Osteoblastoma accounts for less than 1% of all benign primary bone tumors of the spine, while osteoid osteoma accounts for up to 9%. Approximately 25% of all osteoid osteomas and between 30% and 50% of all osteoblastomas are located in the spine.^{1,13} Lesions are more common in the thoracic and lumbar spine than in the cervical spine.^{1,15} Both osteoblastoma and osteoid osteoma demonstrate a predilection for posterior elements of the spine, including the facets, pedicles, or lamina.^{2,15,26}

Osteoid osteomas usually can be differentiated from osteoblastomas on the basis of their size.²² The latter usually are larger, greater than 1.5 to 2.0 cm in diameter, with bone expansion resulting in a predominantly lytic, expansile lesion.

An aneurysmal bone cyst is a benign, expanding, osteolytic bone lesion of unknown etiology. Aneurysmal bone cysts are relatively rare overall, accounting for only 1% to 2% of all primary bone tumors,²² and their peak incidence is in the second decade. Of all locations, the spine is involved in approximately 20% of cases, with the cervical and thoracic portions of the spine most often affected.¹¹ In addition, there is a predilection for involvement of the posterior elements of the spine.^{12,17,22}

Patients and Methods

Twelve adolescent patients with painful scoliosis presented to Zagazig University hospitals over a 3-year period. There were seven males and five females with a mean age of 13 (range 8–18) years. All patients were examined clinically; 7 patients had spinal deformity in the form of a lumbar curve (4 Patients) and a dorsal curve (3 patients). Five patients had lumbar spinal deformity together with neurological deficit (L5 radiculopathy in 3 patients and 2 patients with S1 radiculopathy).

Radiographs were available in 9 patients and done for the remaining 3 patients. All 12 patients had CT and MRI. CT was performed with a high speed helical CT scanner (GE MEDICAL SYSTEMS). MRI examination was performed on a 1.5 tesla

superconducting MR imager (Philips-Achieva). MRI sequences included various combinations of T1-weighted spin-echo and T2-weighted fast-spin-echo in the sagittal, axial and coronal planes. In three cases, gadolinium was administered.

Nine patients had lesions with characteristic appearances of osteoid osteoma on CT, with a demonstrable nidus having central mineralization, allowing a confident radiological diagnosis to be made. Spontaneous clinical resolution occurred in one of these nine patients.

The following imaging features were analyzed for each case: *CT*: presence and location of nidus and sclerosis; *MRI*: presence and pattern of neural arch and vertebral body edema (grade, distribution and extent), presence of an identifiable nidus and abnormality of the paraspinal or epidural space. Grading of the oedema pattern was based on a previously described system⁽⁸⁾ as follows: Grade1: no perinidal edema, Grade2: thin rim of perinidal edema, Grade3: edematous change circumferentially distributed around the nidus, Grade4: extensive oedema more than in grade 3 with or without involvement of adjacent soft tissues.

Surgical excision of the lesion was done in 11 patients; 8 patients underwent enbloc resection with spinal instrumentation and fusion, the other three patients underwent surgical resection of the lesion with decompression of the affected nerve root only.

Results

The demographic data, CT findings, MRI findings are summarized in table 1.

Computed tomography:

The nidus was demonstrated clearly in 9 cases. The nidus was located in the neural arch (pedicle, lamina or articular processes in 7 cases; spinous process in one case and transverse process in one case. Reactive sclerosis was demonstrated in 10 cases. (Figure 1-5)

Magnetic resonance imaging:

The nidus was identifiable in 8 cases, typically showing intermediate signal intensity (SI) on T1-weighted SE sequences and hypointensity on T2-weighted FSE sequences. Focal signal void due to matrix mineralization was also occasionally evident. In the two cases where gadolinium was given, perinidal enhancement of marrow edema was

noted. Edema was classified as grade 4 in 8 cases. The epicenter of the oedema was in the region of the pedicle in 9 of the 12 patients. In one patient, edema was seen predominantly in the transverse process, and in the spinous process in another patient. In the 9 cases where marrow edema was centered on the pedicle region, the oedema classically extended anteriorly into the vertebra involving the posterior ipsilateral one third to two thirds of the vertebral body. In four patients, oedema was seen at two levels, also involving the neural arch of an adjacent vertebra. Involvement of the spinal canal was limited to oedema in the epidural fat in two patients and involvement of ipsilateral neural exit foramen in three patients. Reactive soft-tissue mass causing compromise of the central canal was seen

in the case of aneurysmal bone cyst. The facet joints and adjacent intervertebral discs were normal in all patients. (Figure 1-5)

Biopsy obtained during surgery confirmed the diagnosis in all the patients and correlated well with their radiographic images. Immediate relief of the symptoms occurred in all patients who underwent surgical resection. Spinal deformity resolved spontaneously in the 7 patients who presented with scoliosis during 3 months period. Spinal instability occurred in 2 patients who underwent surgical resection only (3 patients). They had revision surgery and were stabilized with instrumentation and fusion. No recurrence occurred in any of the patients during the follow up period (18 months).

Table 1. Demographic data, CT, and MRI findings of studied cases.

Patient	Sex	Age	CT findings	MRI findings	Biopsy
1	Male	16	Rt. pedicle nidus with reactive sclerosis	Rt. pedicle nidus with perinidal edema	Osteoid osteoma
2	Male	14	Lt. pedicle nidus with reactive sclerosis	Lt. pedicle nidus with perinidal edema	Osteoid osteoma
3	Female	12	Lt. pedicle nidus with reactive sclerosis	Lt. pedicle nidus with diffuse perinidal edema	Osteoid osteoma
4	Male	15	Rt. pedicle nidus with reactive sclerosis	Rt. pedicle nidus with perinidal edema	Osteoid osteoma
5	Male	13	Lt. pedicle nidus with reactive sclerosis	Lt. pedicle nidus with perinidal edema	Osteoid osteoma
6	Female	9	Rt. pedicle nidus with reactive sclerosis	Rt. pedicle nidus with perinidal edema	Osteoid osteoma
7	Male	12	Lt. pedicle nidus with reactive sclerosis	Lt. pedicle nidus with perinidal edema	Osteoid osteoma
8	Female	10	Spinous process nidus with reactive sclerosis	Spinous process edema extending into neural arch	Osteoid osteoma
9	Male	8	Rt. transverse process nidus with reactive sclerosis	Rt. transverse nidus & perinidal edema	Osteoid osteoma
10	Male	14	Lt. pedicle osteolytic lesion with reactive sclerosis & soft tissue mass	Lt. pedicle diffuse edema with soft tissue mass	Osteoblastoma
11	Female	18	Expanding osteolytic destruction of body and relative neural arch, more at Lt. side	Large mixed intensity soft tissue mass with edema and multiple fluid levels	Aneurysmal bone cyst
12	Male	15	Lt. pedicle osteolytic lesion with reactive sclerosis	Lt. pedicle diffuse edema with soft tissue mass	Osteoblastoma

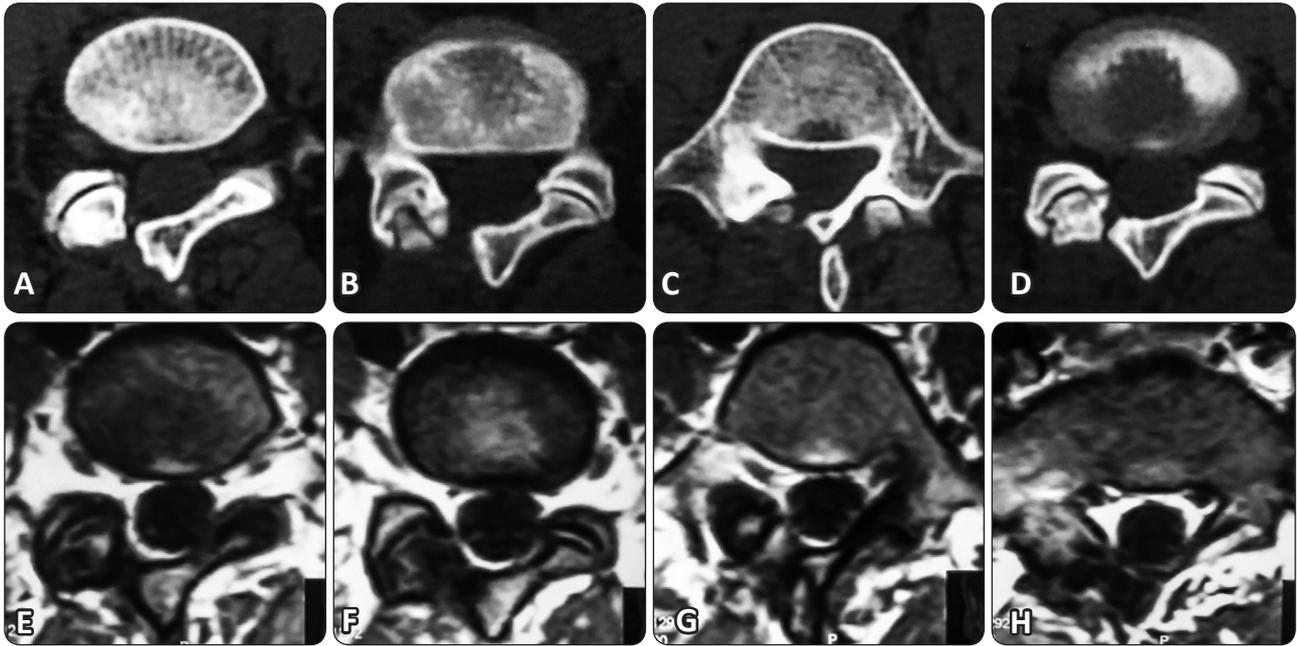


Figure 1. L5 right lamina osteoid osteoma (A-D) Axial CT cuts reveal enlarged sclerotic right lamina of L5 spine with a central nidus. (E-H) axial T2W MRI show enlarged right lamina of L5 with a central nidus and perinidal edema extending to right posterior aspect of L5 body.

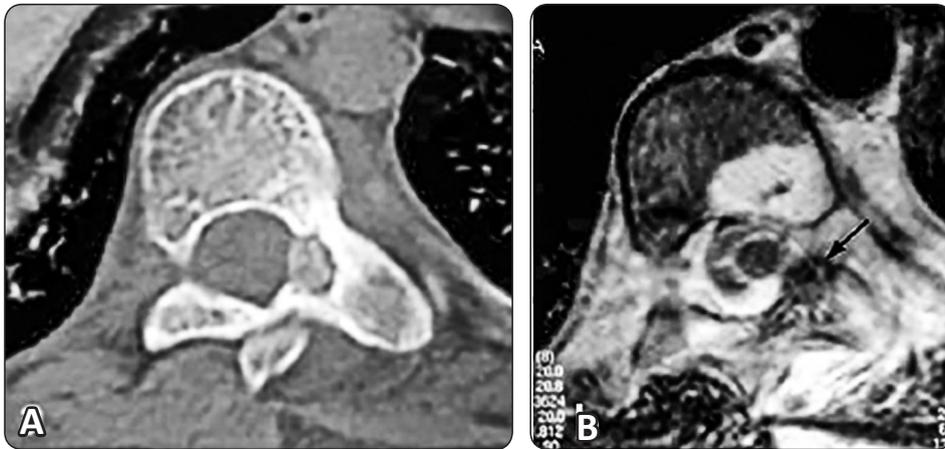


Figure 2. T9 left pedicle osteoid osteoma. (A) Axial CT shows a mineralized nidus in the inferomedial aspect of the left pedicle of T9. (B) Axial T2-weighted MRI shows extensive medullary oedema in the neural arch and posterolateral vertebral body. The nidus is hypointense (arrow)

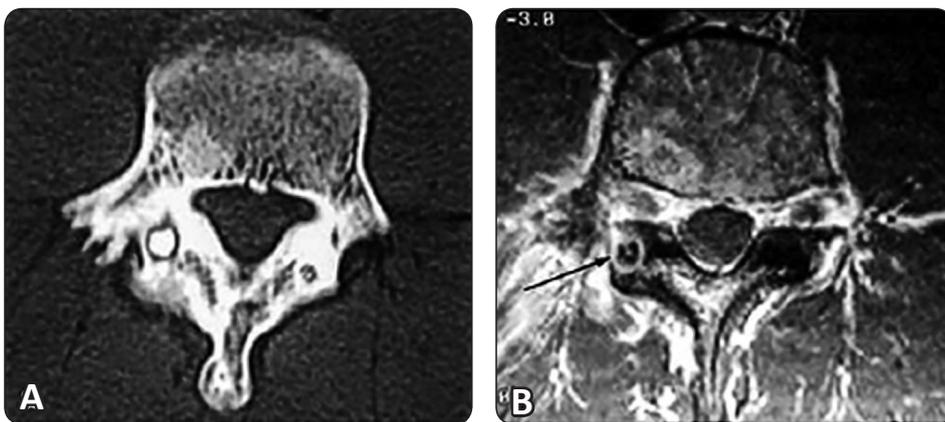


Figure 3. L4 spine osteoid osteoma. (A) Axial CT shows a heavily calcified nidus in the right lamina. (B) Axial T1-weighted MRI shows the nidus (arrow) with extensive central signal void due to calcification

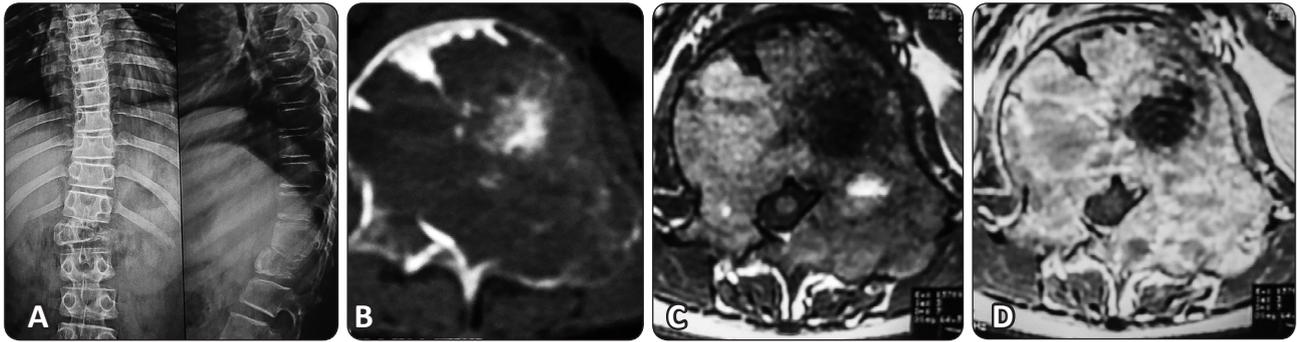


Figure 4. L1 spine aneurysmal bone cyst. (A) Dorso-lumbar AP&Lat radiograph show osteolytic destructive lesion in left pedicle and left body of L1 vertebra with scoliosis and accentuated kyphosis. (B) axial CT scan of L1, bone window shows expanding osteolytic lesion occupying left pedicle, lamina and most of L1 body with soft tissue component encroaching upon thecal sac. T1-weighted MRI, pre (C) and post-contrast (D) show enlarged expanding destructive lesion of L1 left pedicle, lamina and most of vertebral body of mixed intensity and heterogeneous enhancement and multiple fluid levels.

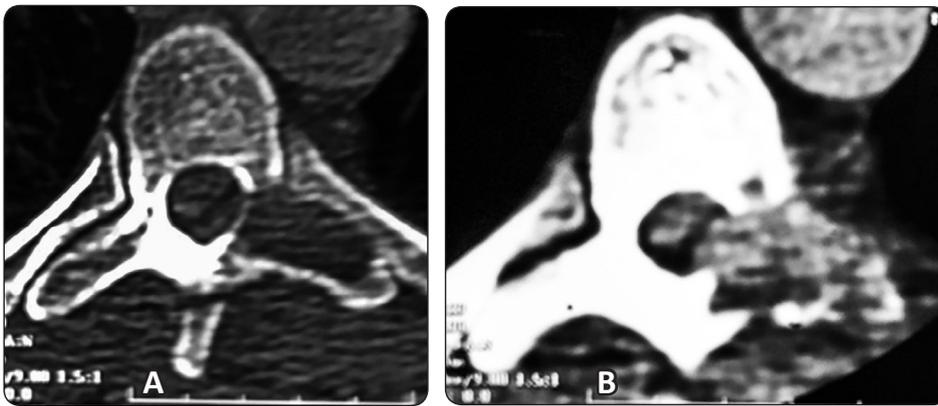


Figure 5. D9 spine osteoblastoma. (A,B) axial CT scan show expanding osteolytic lesion in left pedicle and transverse process of D9 with bone destruction and soft tissue lesion partially encroaching upon left thecal sac.

Discussion

Spinal osteoid osteoma and osteoblastoma have been identified in previous studies as the most common lesions to produce a pain provoked reactive scoliosis.²⁰ For this to occur, a muscle spasm would have to be predominantly unilateral and associated with lesions located to one side of the midline. Ten to twenty percent of osteoid osteoma occurs in the spine, with the commonest location being the lumbar vertebrae (59%), and in majority of the cases, the nidus is located in the neural arch.^{14,39}

Osteoblastoma and osteoid osteoma are similar histologically, and the differential diagnosis is usually made on the basis of clinical and radiographic evaluation. Characteristic lesions larger than 2 cm are typically an osteoblastoma, lesions smaller than 1 cm are typically an osteoid osteoma. Osteoid osteomas are benign latent lesions that spontaneously regress, whereas osteoblastomas are

benign but locally aggressive.^{19,22,24}

In a comparison of medical and surgical treatment, Kneisl and Simon¹⁶ reported that long-term administration of non-steroidal anti-inflammatory drugs was as effective as excision for the treatment of osteoid osteoma. Medical treatment is often prolonged and associated with problems such as gastrointestinal irritation or bleeding. So, surgery may be preferred.

Because of the benign, aggressive behavior of osteoblastoma lesions, surgical treatment is indicated at diagnosis. Excision with extended, intralesional curettage should be performed for most lesions. The entire nidus is excised with use of a high speed diamond bur and with the aid of a surgical loupe and a headlamp. Fusion and instrumentation can provide stability if spinal balance is jeopardized by removal of the lesion. If instrumentation is required, titanium instrumentation is recommended so that

high-quality postoperative computed tomographic or magnetic resonance images can be acquired to detect recurrence.³⁵

For both lesions, improvement in the spinal deformity has been observed following complete surgical removal. Ozaki et al,²⁴ reported improvement of scoliosis following resection of osteoid osteoma or osteoblastoma in sixteen of seventeen patients.

The classical clinical presentation of spinal osteoid osteoma is that of painful scoliosis. Other clinical features include nerve root irritation and night pain. Pain relief with aspirin is classical.³⁴ However, the typical symptoms of osteoid osteoma are reported to occur only in one half to two thirds of patients.³⁶ Spontaneous resolution of osteoid osteoma, which occurred in one of our cases, has been previously reported.^{31,9} Although the natural history of osteoid osteoma is not fully understood, it appears to be of growth followed by eventual regression in a variable period, and it does not generally grow beyond 1cm. in size.^{5,6}

In most cases of spinal osteoid osteoma, radiographs demonstrate an area of neural arch sclerosis at the apex of the concavity of scoliosis. In the thoracic region particularly, the nidus is usually not evident.^{20,27,28} CT has been considered the investigation method of choice to demonstrate and localize osteoid osteoma, and MRI has been considered to produce misleading appearances and cause diagnostic errors due to presence of associated soft tissue mass, bone marrow oedema and joint effusion.^{3,23} However, some authors recommend routine pre-operative imaging of spinal osteoid osteoma with CT and MRI in all cases.³⁹ The characteristic appearances of osteoid osteoma on CT are the presence of low-attenuation nidus with central mineralization and varying degrees of perinidal sclerosis.¹⁰

On plain radiography or CT imaging, an aneurysmal bone cyst typically appears as an osteolytic, expansile, multicystic lesion. Magnetic resonance imaging is useful for demonstrating the characteristic blood-fluid levels that are diagnostic of an aneurysmal bone cyst.²²

The diagnosis of spinal osteoid osteoma is relatively straightforward when classical symptoms are present along with positive radiographs. In these cases, CT is probably the preferred examination method to confirm the diagnosis and localize the

lesion prior to treatment. However, in children and young adults, when there are no classical clinical features, MRI is usually the next investigation method following plain radiography.^{4,33,40} Also, MRI is required to specifically document the effect of the lesion on the spinal canal and cord.²⁹ Hence, it is very important to recognize the MRI features of spinal osteoid osteoma. The nidus of an osteoid osteoma can have a very heterogeneous, variable appearance on MRI, making characterization difficult.^{3,7,30} Gadolinium administration has been suggested to improve conspicuity and detection of the nidus.^{3,18,38} In addition, dynamic gadolinium-enhanced MRI has been shown to demonstrate osteoid osteoma with increased conspicuity compared with non-enhanced MRI.¹⁸ In only one of our cases was gadolinium administered, with the demonstration of perinidal enhancement. However, the nidus was also visible on axial T2-weighted image in this case as a low signal intensity lesion surrounded by high signal intensity oedema. In the eight cases where a nidus was identifiable in our series, it was most conspicuous on axial T2-weighted images, as the oedema served to demarcate the lesion, facilitating detection of the nidus. The nidus typically showed low signal intensity on T2-weighted and intermediate signal intensity on T1-weighted images. Focal signal void due to matrix mineralization was occasionally evident.

In four of our cases, similar changes of oedema were noted on MRI, indicating that perinidal inflammatory changes can be present at multiple levels in spinal osteoid osteoma. Similar features have been reported with spinal osteoblastoma.³⁰ Whilst some studies have suggested an inverse relationship of perinidal oedema to the age of the patient and use of aspirin, others have not found such a correlation.^{3,8,32} No significant relationship has been proven between oedema and duration of symptoms.⁸ The possibility that vertebral lesions cause a higher grade of oedema has been suggested in a previously reported series of spinal osteoid osteoma.⁸

In our study, there was oedema of variable grades in all cases, and in 9 of the 12 cases, there was an extensive pattern of oedema in the region of the pedicle classically extending anteriorly to involve the posterolateral aspect of the vertebral body to a varying degree. In all of these 9 cases, the nidus was

located in the pedicle, lamina or articular facet.

Marrow oedema in the pedicle and vertebral body are by no means specific for osteoid osteoma. There is a differential diagnosis, including degenerative disc and facet joint disease, spondylolysis and pediculolysis.²¹

Misinterpretation of the changes of marrow oedema due to osteoid osteoma as malignancy or previous trauma can be minimized by recognition of the characteristic findings on MRI and by interpreting MRI in conjunction with other available images.³⁷

Conclusion

The most characteristic MRI findings that should raise suspicion of the spinal osteoid osteoma diagnosis, in a painful scoliotic patients is oedema in the pedicle and lamina extending anteriorly to involve the posterolateral vertebral body of the same side. On non-enhanced MRI, the nidus is optimally visualized on T2-weighted sequences, when it appears as a hypointense lesion surrounded by marrow oedema.

References

1. Akbarnia BA, Rooholamini SA: Scoliosis caused by benign osteoblastoma of the thoracic or lumbar spine. *J Bone Joint Surg Am* 63:1146-55, 1981
2. Amacher AL, Eltomey A: Spinal osteoblastoma in children and adolescents. *Childs Nerv Syst* 1:29-32, 1985
3. Assoun J, Richardi G, Railhac JJ, Baunin C, Fajadet P, Giron J, Maquin P, Hadded J, Bonneville P: Osteoid osteoma: MR imaging versus CT. *Radiology* 191:217-223, 1994
4. Bohndorf K, Reiser M, Lochner B, Feaux de Lacroix, Steinbrich W: Magnetic resonance imaging of primary tumours and tumour-like lesions of bone. *Skelet Radiol* 15:511-517, 1986
5. Cantwell CP, Obyrne J, Eustace S: Current trends in treatment of osteoid osteoma with an emphasis on radiofrequency ablation. *Eur Radiol* 14:607-617, 2004
6. Cassar-Pullicino VN, McCall IW, Wan S: Intra-articular osteoid osteoma. *Clin Radiol* 45:153-160, 1992
7. Davies M, Cassar-Pullicino VN, Davies AM, McCall IW, Tyrrell PN: The diagnostic accuracy of MR imaging in osteoid osteoma. *Skelet Radiol* 31:559-569, 2002
8. Ehara S, Rosenthal DI, Aoki J, Fukuda K, Sugimoto H, Mizutani H, Okada K, Hatori M, Abe M: Peritumoral edema in osteoid osteoma on magnetic resonance imaging. *Skelet Radiol* 28:265-270, 1999
9. Flaherty RA, Pugh DG, Dockerty MB: Osteoid osteoma. *Am J Roentgenol* 76:1041-1051, 1956
10. Gamba JL, Martinez S, Apple J, Harrelson JM, Nunley JA: Computed tomography of axial skeletal osteoid osteomas. *Am J Roentgenol* 142:769-772, 1984
11. Garneti N, Dunn D, El Gamal E, Annesley Williams D, Nelson IW, Sandemon DR: Cervical spondyloptosis caused by an aneurysmal bone cyst: A case report. *Spine* 28:E68, 2003
12. Giddings CEB, Bray D, Stapleton S, Daya H: Aneurysmal bone cyst of the spine. *J Laryngol Otol* 119:495-501, 2005
13. Healey JH, Ghelman B: Osteoid osteoma and osteoblastoma: Current concepts and recent advances. *Clin Orthop Relat Res* 204:76-85, 1986
14. Jackson RP, Reckling FW, Mants FA: Osteoid osteoma and osteoblastoma. Similar histological lesions with different natural histories. *Clin Orthop Relat Res* 128:303-313, 1977
15. Kneisl JS, Simon MA: Medical management compared with operative treatment for osteoid-osteoma. *J Bone Joint Surg Am* 74:179-185, 1992
16. Keim HA, Reina EG: Osteoid-osteoma as a cause of scoliosis. *J Bone Joint Surg Am* 57:159-63, 1975
17. Kransdorf MJ, Sweet DE: Aneurysmal bone cyst: concept, controversy, clinical presentation, and imaging. *AJR Am J Roentgenol* 164: 573, 1995
18. Liu PT, Chivers FS, Roberts CC, Schultz CJ, Beauchamp CP: Imaging of osteoid osteoma with dynamic gadolinium-enhanced MR imaging. *Radiology* 227:691-700, 2003
19. Marsh BW, Bonfiglio M, Brady LP, Enneking WF: Benign osteoblastoma: range of manifestations. *J Bone Joint Surg Am* 57:1-9, 1975
20. Metha MH, Murray RO: Scoliosis provoked by painful vertebral lesions. *Skeletal Radiol* 1:223-230, 1977

21. Morrison JL, Kaplan PA, Dussault RG, Anderson MW: Pedicle marrow signal intensity changes in the lumbar spine: a manifestation of facet degenerative joint disease. *Skelet Radiol* 29:703–707, 2000
22. Murphey MD, Andrews CL, Flemming DJ, Temple HT, Smith WS, Smirniotopoulos JG: Primary tumors of the spine: Radiologic-pathologic correlation. *Radiographics* 16:1131, 1996
23. Nogues P, Marti-Bonmati L, Aparisi F, Saborido MC, Garci J, Dosda R: MR imaging assessment of juxta cortical edema in osteoid osteoma in 28 patients. *Eur Radiol* 8:236–238, 1998
24. Ozaki T, Liljenqvist U, Halm H, Hillmann A, Gosheger G, Winkelmann W: Giant cell tumor of the spine. *Clin Orthop Relat Res* 401:194-201, 2002
25. Ozaki T, Liljenqvist U, Hillmann A, Halm H, Linder N, Gosheger G, Winkelmann W: Osteoid osteoma and osteoblastoma of the spine: experiences with 22 patients. *Clin Ortho Relat Res* 397:394-402, 2002
26. Pettine KA, Klassen RA: Osteoid osteoma and osteoblastoma of the spine. *J Bone Joint Surg Am* 68:354-361, 1986
27. Ransford AO, Pozo GL, Hutton PAN, Kirwan EOG: The behaviour pattern of scoliosis associated with osteoid osteoma or osteoblastoma of the spine. *J Bone Joint Surg (Br)* 66:16-20, 1984
28. Saifuddin A, White J, Sherazi Z, Shaikh MI, Natali C, Ransford AO: Osteoid osteoma and osteoblastoma of the spine. Factors associated with the presence of scoliosis. *Spine* 23:47-53, 1998
29. Scutto A, Accardo C, Rotondo M, Lus G, La Marca P, Natale M, Agozzino I, Cortrufo R: Unusual manifestation of vertebral osteoid osteoma: case report. *Eur Radiol* 12:109–112, 2002
30. Shaikh MI, Saifuddin A, Pringle J, Natali C, Sherazi Z. Spinal osteoblastoma: CT and MR imaging with pathological correlation. *Skelet Radiol* 28:33–40, 1999
31. Sherman MS: Osteoid osteoma: review of literature and report of 30cases. *J Bone Joint Surg* 29:918–930, 1947
32. Spouge AR, Thain LM: Osteoid osteoma: MR imaging revisited. *Clin Imaging* 24:19–27, 2000
33. Stoller DW: Magnetic resonance imaging in orthopaedics and rheumatology. Lippincott, Philadelphia 1989
34. Swee RG, McLeod RA, Beabout JW: Osteoid osteoma: detection, diagnosis and localisation. *Radiology* 130:117–123, 1979
35. Torpey BM, Dormans JP, Drummond DS: The use of MRI-compatible titanium segmental spinal instrumentation in pediatric patients with intraspinal tumor. *J Spinal Disord* 8:76-81, 1995
36. Wells RG, Miller JH, Sty JR: Scintigraphic patterns in osteoid osteoma and spondylolysis. *Clin Nucl Med* 12:39–44, 1987
37. Woertler K: Benign bone tumors and tumor-like lesions: value of cross sectional imaging. *Eur Radiol* 13:1820–1835, 2003
38. Youssef BA, Haddad MC, Zahrani A, Sharif HS, Morgan JL, al-Shahed M, al-Sabty A, Choudary R: Osteoid osteoma and osteoblastoma: MRI appearances and the significance of ring enhancement. *Eur Radiol* 6:291–296, 1996
39. Zileli M, Cagli S, Basdemir G, Ersahin Y: Osteoid osteomas and osteoblastomas of the spine. *Neurosurg Focus* 15:E5, 2003
40. Zimmer WD, Berquist TH, McLeod RA, Sim FH, Pritchard DJ, Shives TC, Wold LE, May GR. Bone tumors: magnetic resonance imaging versus computed tomography. *Radiology* 155:709–718, 1985

Address reprint
request to:

Amr El-Adawy, MD

Orthopedic Surgery Departments, Faculty of Medicine, Zagazig University, Egypt
Email: aeladawy@gmail.com

الملخص العربي

دور الفحص بالأشعة المقطعية بالكمبيوتر والفحص بالرنين المغناطيسي في تشخيص حالات الجنف المؤلم لدى المرضى في سن المراهقة

البيانات الخلفية: ورم العظمانيات هو السبب الأكثر شيوعا لجنف المراهقين المؤلمة. وعلى الرغم من أهمية التصوير الشعاعي العادي، فإن للأشعة الملونة والمقطعية دورا هاما في التشخيص. هذه الطرائق تسبب مخاطر الإشعاع للمرضى إلا أن التصوير بالرنين المغناطيسي فهو آمن وخالي من الإشعاع، مع الدقة في تقييم المريض.

الغرض: تقييم حالات الجنف المؤلم لدى المراهقين باستخدام الأشعة المقطعية والرنين المغناطيسي.

تصميم الدراسة: دراسة استطلاعية أجريت على ١٢ مريضا الشباب شملت الفحص السريري والأشعة المقطعية والرنين المغناطيسي.

المرضى والطريقة: أجريت هذه الدراسة على إثني عشر مريضا تراوحت أعمارهم ما بين ثمانية إلى ثمانية عشر سنة وكانوا سبعة مرضى ذكور وخمسة مرضى إناث. وكانت شكاوهم جميعا جنف مؤلم بالظهر. أجريت هذه الدراسة بمستشفيات جامعة الزقازيق من مايو ٢٠١١ إلى أبريل ٢٠١٤ وجميع المرضى تم فحصهم بالأشعة المقطعية والرنين المغناطيسي. وتم إجراء جراحة لأحد عشر مريضا منهم.

النتائج: تبين من هذه الدراسة أن تسعة مرضى يعانون من ورم عظمي حميد بالفقرات. ومريضان يعانيان من استيوبلاستوما. ومريضا واحدا يعانى من تورم وعائي دموي كيسى. أظهرت الأشعة المقطعية مكمّن الورم العظمي الحميد بالفقرات في تسعة مرضى. بينما الرنين المغناطيسي أظهرها في ثمانية مرضى فقط ولكنها أظهرت التغيرات بالزوائد العظمية للفقرات نتيجة لتورم الأنسجة.

الخلاصة: الفحص بالرنين المغناطيسي مفيد وفعال في اكتشاف الورم العظمي الحميد للفقرات في المرضى الذين يعانون من آلام بالظهر مصحوبة بجنف في سن المراهقة حيث أنها تكتشف التغيرات المصاحبة للأورام العظمية للفقرات مبكرا كما انه فحص آمن لا يعرض المريض لأي أشعاع. أما الحالات الغير واضحة التشخيص فانه يوصى بفحصهم بالأشعة المقطعية حالا لسرعة التشخيص وبالتالي العلاج.