Thoracic osteochondroma

A review of the English-language literature demonstrated 49 cases of solitary thoracic spinal osteochondromas presenting with myelopathy, the majority of which underwent laminectomy for decompression and excision of tumor.

A total of 8 patients required instrumentation and fusion for stabilization of the thoracic spine after resection of the osteochondroma [1].

Case series

Lotfinia et al. described one patient in their series who initially underwent a posterior transpedicular approach for a T9 VB osteochondroma which was unsuccessful and had to be aborted.

This patient then underwent a reoperation for combined anterior transthoracic resection of tumor and posterior placement of instrumentation and fusion [2].

2015

8 cases [3].

2013

Zaijun et al recommend gross total resection of all diagnosed OCs involving the mobile spine because of the risk of malignant transformation. Early detection and total excision of symptomatic spinal lesions in these cases may be the key to providing the best outcome. The neurological defect arising from OC can be improved by surgical intervention in most patients [4].

Case reports

2016

A large solitary osteochondroma originating from the posterior vertebral body of T9 causing spinal cord compression and myelopathy. A 17-year-old man presented with 3 months of bilateral feet numbness and gait difficulty. Imaging demonstrated a large left-sided 5.9 cm × 5.0 cm × 5.4 cm osseous mass arising from the T9 vertebra consistent with an osteochondroma. He underwent bilateral costotransversectomies, and a left two-level lateral extracavitary approach for three partial corpectomies to both safely decompress the spinal canal as well as obtain a gross total resection of the tumor. Use of the O-arm intraoperative stereotactic computed tomographic navigation system assisted in delineating the osseous portions of the tumor for surgical removal. He experienced complete neurologic recovery after operative intervention.

Careful surgical planning is needed to determine the best approach for spinal cord decompression

and resection of this tumor, especially taking into account the bony elements from which it arises [5].

2013

A 9-year-old boy presented with a history of frequent falls while walking and standing without support, which progressively worsened over 4-5 days. There was also history of difficulty in standing up from the squatting position. There was visible wasting of bilateral lower limbs. Tone was increased in both lower limbs, and spasticity was positive. There was an inability to perform straight leg raising test. Local examination did not reveal any visible swelling or deformity except for tenderness at D1-D2 spinous processes. The neurological examination was normal. Plain computed tomography of thorax revealed anterior wedge compression of D1 vertebral body with sclerotic lesion involving body and posterior arch elements of D1 vertebra with ossified tissue extending into the spinal canal cavity causing its narrowing [Figure 1]. Magnetic resonance imaging of the whole spine revealed an enhancing extradural mass protruding into the spinal canal at T1 vertebral level causing compression, and posterior displacement of spinal cord.

Under general anaesthesia, patient was put in the prone position. A vertical para median incision was made on the tumor. Trapezius was dissected and paraspinal muscles were incised along the fibers to expose the tumor. Elliptical capsulated mass was seen with all the borders well-defined. Near total excision of the tumor was carried out. On microscopic examination, there was a thin cartilage cap with an orderly arrangement of chondrocytes undergoing endochondral ossification to create trabecular bone separated by marrow fat. The histopathological examination was diagnostic of osteochondroma. Postoperative course was uneventful. By 6th postoperative week, patient was able to stand and walk without support. There was reduced spasticity and the tone was nearly normal in both lower limbs [6].

A 19-year-old man presented with a 5-year history of back pain radiating to the lower extremities and paresthesis of the toes during the last year. Plain X-ray revealed a large cauliflower shaped exophytic mass at the level of T8, T9 and T10 vertebrae. Computed tomography (CT) and magnetic resonance imaging (MRI) showed an abnormal bony mass arising from the posterior arch of T9 with protrusion to the spinal canal and marked cord compression. The cortex and medulla of the lesion had continuity with those of the T9 vertebra. Surgical en bloc resection was performed and the patient's symptoms resolved. The histopathologic diagnosis was osteochondroma [7].

2011

Tian et al., describe a case of spinal cord compression due to an osteochondroma arising from the T-6 vertebral body in a patient with hereditary multiple exostoses. This 16-year-old boy presented with spastic paraparesis. Surgical decompression was followed by resolution of the neurological impairments [8].

2007

Song and Lee evaluate the clinical presentation and radiographic findings of a patient with solitary osteochondroma and compressive myelopathy. The patient gradually improved and symptoms

stopped progressing after surgical removal of the lesion [9].

2005

Brastianos et al. described performing a T12 corpectomy with a distractible cage and locking plate and screws from an anterolateral approach for a posterior VB osteochondroma with the subsequent complete recovery of the patient's presenting symptoms [10].

2003

Nassar et al report the case of a 16 years old male with a family history of hereditary multiple exostoses who presented with spinal cord compression. MR examination showed an intraspinal extradural bone lesion at the T1-T2 level, hyperintense on T1 weighted and hypointense on T2 weighted images, causing marked cord deformity. The CT scan showed a tumor of the body and left pedicle of T2 with severe narrowing of the spinal canal [11].

An 8-year-old girl with hereditary multiple exostosis was referred for possible thoracotomy and anterior decompression of a T4 osteochondroma thought to be causing an atypical “scoliosis.” Further examination, review of the radiographs, and computed tomography scan showed a large osteochondroma encroaching on the neural elements. The patient's neurologic symptoms and spinal curvature resolved in the 2 years after surgical excision of the lumbar osteochondroma.

Patients with hereditary multiple exostosis and spinal curvature require further diagnostic evaluation to ensure that an osteochondroma in the spinal canal is not the cause of that curvature [12].

2002

A case of a radiation-induced osteochondroma arising from the vertebral body of T4 in an 18-year-old man is reported. The patient presented with a history of progressive left lower extremity weakness. At 7 years of age, he had undergone resection of a cerebellar medulloblastoma and received adjunctive craniospinal irradiation and systemic chemotherapy. Both CT and MR imaging revealed an extradural mass contiguous with the posteroinferior endplate of the T4 vertebral body. This case indicates that radiation-induced osteochondroma should be considered in the differential diagnosis of patients with symptoms of myelopathy or nerve root compression and a history of radiation therapy involving the spine in childhood [13].

1996

A 24-year-old man with hereditary multiple exostoses had numbness of the lower extremities and difficulty walking. CT displayed a calcified extradural mass lesion within the spinal canal at T-8 causing cord compression. MR imaging showed it to be contiguous with the upper endplate of T-8, suggesting the diagnosis of osteochondroma, a rare cause of cord compression, and distinguishing the lesion from a calcified disk fragment [14].

[1] , [5]
Pham MH, Cohen J, Tuchman A, Commins D, Acosta FL. Large solitary osteochondroma of the thoracic spine: Case report and review of the literature. Surg Neurol Int. 2016 May 17;7(Suppl 13):S323-7. doi: 10.4103/2152-7806.182542. eCollection 2016. PubMed PMID: 27274405; PubMed Central PMCID: PMC4879861.

[2]
Lotfinia I, Vahedi P, Tubbs RS, Ghavame M, Meshkini A. Neurological manifestations, imaging characteristics, and surgical outcome of intraspinal osteochondroma. J Neurosurg Spine. 2010;12:474–89.

[3]
Sciubba DM, Macki M, Bydon M, Germscheid NM, Wolinsky JP, Boriani S, Bettegowda C, Chou D, Luzzati A, Reynolds JJ, Szövérfi Z, Zadnik P, Rhines LD, Gokaslan ZL, Fisher CG, Varga PP. Long-term outcomes in primary spinal osteochondroma: a multicenter study of 27 patients. J Neurosurg Spine. 2015 Jun;22(6):582-8. doi: 10.3171/2014.10.SPINE14501. Epub 2015 Mar 20. PubMed PMID: 25793467; PubMed Central PMCID: PMC4859212.

[4]
Zaijun L, Xinhai Y, Zhipeng W, Wending H, Quan H, Zhenhua Z, Dapeng F, Jisheng Z, Wei Z, Jianru X. Outcome and prognosis of myelopathy and radiculopathy from osteochondroma in the mobile spine: a report on 14 patients. J Spinal Disord Tech. 2013 Jun;26(4):194-9. doi: 10.1097/BSD.0b013e31823eb239. PubMed PMID: 22124421.

[6]
Mardi K, Madan S. Pediatric solitary osteochondroma of T1 vertebra causing spinal cord compression: A case report. South Asian J Cancer. 2013 Jul;2(3):144. doi: 10.4103/2278-330X.114130. PubMed PMID: 24455595; PubMed Central PMCID: PMC3892549.

[7]
Mehrian P, Karimi MA, Kahkuee S, Bakhshayeshkaram M, Ghasemikhah R. Solitary osteochondroma of the thoracic spine with compressive myelopathy; a rare presentation. Iran J Radiol. 2013 Jun;10(2):77-80. doi: 10.5812/iranjradiol.12015. Epub 2013 May 20. PubMed PMID: 24046783; PubMed Central PMCID: PMC3767014.

[8]
Tian Y, Yuan W, Chen H, Shen X. Spinal cord compression secondary to a thoracic vertebral osteochondroma. J Neurosurg Spine. 2011 Sep;15(3):252-7. doi: 10.3171/2011.4.SPINE10484. Epub 2011 May 20. Review. PubMed PMID: 21599443.

[9]
Song KJ, Lee KB. Solitary osteochondroma of the thoracic spine causing myelopathy. Eur J Pediatr Surg. 2007 Jun;17(3):210-3. PubMed PMID: 17638163.

[10]
Brastianos P, Pradilla G, McCarthy E, Gokaslan ZL. Solitary thoracic osteochondroma: Case report and review of the literature. Neurosurgery. 2005;56:E1379.

[11]
Nassar I, Semlali S, El Quessar A, Kacemi L, Mahi M, Chakir N, El Hassani MR, Jiddane M. [A rare cause of spinal cord compression: osteochondroma of the thoracic spine. A case report]. J Radiol. 2003 Sep;84(9):1020-2. French. PubMed PMID: 13679757.

[12]
Fiechtl JF, Masonis JL, Frick SL. Spinal osteochondroma presenting as atypical spinal curvature: a case report. Spine (Phila Pa 1976). 2003 Jul 1;28(13):E252-5. PubMed PMID: 12838114.

[13]
Gorospe L, Madrid-Muñiz C, Royo A, García-Raya P, Alvarez-Ruiz F, López-Barea F. Radiation-induced osteochondroma of the T4 vertebra causing spinal cord compression. Eur Radiol. 2002 Apr;12(4):844-8. Epub 2001 Aug 31. Review. PubMed PMID: 11960236.

[14]
Quirini GE, Meyer JR, Herman M, Russell EJ. Osteochondroma of the thoracic spine: an unusual cause of spinal cord compression. AJNR Am J Neuroradiol. 1996 May;17(5):961-4. PubMed PMID: 8733974.