Exostosis, also called Osteochondroma, are one of the most common benign bone tumors commonly found in flat and long bones particularly the distal femur and proximal tibia. However, its spinal involvement is quite rare with incidence varying from 1.3% - 4.1% in literature. Exostosis involving the spine may produce symptoms through compression of spinal roots or of the spinal cord itself or may remain asymptomatic. The presence and extent of lesion are best delineated with computed tomography, whereas Magnetic Resonance Imaging (MRI) is required in cases of spine to visualize the spinal cord involvement. Surgical resection should be performed as soon as the tumor becomes symptomatic, or for cosmetic reasons. Complete resection of tumor is the goal, and removal of entire cartilaginous cap is recommended to prevent recurrence. In this report we present a case of giant Exostosis located at cervico-thoracic junction.

Exostosis or Osteochondroma of spine is a rare condition that may or may not be accompanied by neurological dysfunction. We report a rare case of giant exostosis located at cervico – thoracic junction. A twenty one year old male presented to us with a large bony swelling over the posterior aspect of neck which was present since childhood with progressive increase in size, without any neurological deficits. Magnetic Resonance Imaging revealed a large cartilage capped mass arising from the spinous process and lamina of C7 vertebra. Through a posterior approach he underwent a decompressive laminectomy and complete excision of the lesion. The diagnosis of exostosis was confirmed by histopathological studies. Here we briefly describe the incidence, presenting features, radiographic findings and management options for such rare lesions.

Key Words: exostosis, giant osteochondroma, spine

Case Report

A 21-year-old male presented to us with a painless, hard, irregular bony mass in the posterior aspect of neck which was present since childhood, initially small but gradually increasing in size with age. The family history was negative for such similar lesion. On examination, about 12 x 8 x 9 cm, non-tender, hard, bony, irregular, non-mobile mass was noted over posterior left lateral aspect of neck (Figure 1A). There was no neurological deficit and the rest of physical examination was unremarkable. MRI of cervico-dorsal spine was suggestive of giant cartilage capped exostosis in the left lateral aspect of cervico-thoracic vertebra attached to the spinous process and lamina of C7 vertebra and extending posteriorly upto subcutaneous plain (Figure 1B). Posterior approach was adopted and the mass was completely excised from the C7 spinous process. The mass was hard bony tissue with...
a cauliflower shape and cartilaginous caps (Figure 1C). Histopathology of the mass confirmed it to be Exostosis (Osteochondroma) (Figure 1D). Post operatively the patient made an uneventful recovery and was discharged without any neurological deficits.

**Discussion**

Exostosis or Osteochondroma are the most common benign tumors of the bone which was first described by Sir Astley Cooper in 1818. It accounts for 34.4% of all benign bone tumors and approximately 8% of primary bone tumors. It occurs in two distinct clinical settings, as solitary or multiple lesions, often associated with Hereditary Multiple Exostosis (HME). Conflicting reports exist as to whether solitary exostosis or lesions associated with HME more commonly affects the spine. Roblot et al. reported that 72% of published cases were solitary. Similarly Albrecht et al. also reported that solitary spinal exostosis were most common composing 75% of cases reported. However other studies have reported a slightly increased incidence of spinal exostosis associated with HME. Exostosis commonly affects the flat and long bones particularly the distal femur and proximal tibia. Spinal involvement is rare, especially in solitary forms, accounting for only 1.3% to 4.1% of all solitary localizations. It is thought to arise from a lateral displacement of a portion of the epiphyseal growth cartilage to become a bone like outgrowth capped with cartilage. Therefore many pathologists consider it as development anomalies rather than true tumor.

Although exostosis originates from all parts of the spinal column, the cervical region is the most common location in spinal column while the lower thoracic and lumbar region rarely gets involved. A review of 20 years experience with spinal exostosis from a single institution showed an incidence of 20% for thoracic and 80% for cervical exostosis. Albrecht et al. reported 50% of lesions, both solitary and associated with HME were located in cervical spine. However, Roblot et al. found that 36% of 92 lesions reported originated in the cervical spine compared with 29% and 28%, arising in the thoracic and lumbar spine, respectively. Similarly, Bess et al. identified 165 reported cases of spinal exostosis, among them 53% were solitary lesion which occurred most commonly in cervical spine especially C1.

The propensity for exostosis to develop in cervical spine has been attributed to the mobility of cervical spine. They can take origin from any part of the vertebra, but usually arises from the posterior elements, where the secondary centers of ossification are found. In our case, the exostosis originated from the lamina and spinous process of C7 vertebra.

Solitary cervical spine exostosis may produce a wide variety of symptoms depending on their location and relationship to associated structures. The most common physical findings are a non tender palpable mass in the posterior aspect of cervical spine. Anterior vertebral body lesion may encroach esophagus, larynx, trachea, recurrent laryngeal nerve or vascular structures and produce dysphagia, hoarseness or vascular compromise. Similarly, posterior vertebral lesion may encroach into spinal canal and produce neurological symptoms, spinal stenosis, radiculopathy and compressive myelopathy. Rose et al. reported sudden death in a patient who had an exostosis of the odontoid process of axis that partially transected the cervical spinal cord. In our case, the patient presented with a non tender palpable mass with no features of spinal cord compression.

Spinal exostosis are more difficult to detect in plane radiographs, probably because of the complex image that the spine forms. When visible, they typically appear as pedunculated or sessile bone-like projections. In a study of 36 patients with spinal exostosis who had radiography performed, Roach et al. found that only 17% were visible in plain films. Thus the diagnosis is usually confirmed by CT and MRI scannings. Computed tomography is useful in the detection of the origin and extent of spinal exostosis, whereas MR imaging is of greater value in demonstrating the relationship of the mass to the spinal cord, nerve roots and adjacent soft tissue. Furthermore, the exact size of the

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**Figure 1:** A) Mass in the posterior aspect of neck, B) MRI showing giant cartilage capped exostosis in the left lateral aspect of cervico-thoracic vertebra attached to the spinous process and lamina of C7 vertebra and extending posteriorly up to subcutaneous plain, C) Intraoperative picture of mass showing cauliflower shape with cartilaginous caps, D) Histopathology showing bone with cartilaginous cap c/w Exostosis.
tumor may be underestimated on CT scans because the cartilage cap of the tumor is invisible. Cartilage itself is best shown on MRI; cartilage caps with thickness of more than 3mm can be reliably detected on MRI, leading to an accurate pre-operative diagnosis. In our case, MRI was performed for pre-operative diagnosis which showed the cartilaginous caps.

For the treatment point of view, asymptomatic lesions can be followed without surgical interventions, whereas surgical treatment should be performed as soon as the tumor becomes symptomatic or for cosmetic reasons. In our patient’s case, a visible mass lesion on neck was the indication for surgical interventions. Delay in diagnosis and treatment may cause irreversible neurological impairment. The aim of the surgical treatment should be to remove as much of tumor as possible without causing functional deficit. Albrecht et al. reported good results with surgical resection, finding that 89% of symptomatic patients treated surgically reported improvements of symptoms. Similarly Bess et al. reported complete resolution of presenting symptoms after surgery in all patients with intraspinal exostosis. However they also followed two patients with intraspinal exostosis with no progression of symptoms.

The probability of exostosis converting to malignancy is very rare. Landi et al. reported a case of malignant transformation of cervical exostosis in patient with HME. Complete resection of the cartilaginous cap is necessary to prevent recurrence. Incomplete resection may lead to recurrence which occurs in about 2% of lesions.

**Conclusion**

In conclusion, exostosis, the most common tumoral lesions of the skeletal system, may rarely involve the vertebra. These lesions particularly occur in the cervical region and should be considered in the differential diagnosis, when confronted with an expansile mass. Excision of the lesions along with the cartilaginous cap is necessary for the treatment of neurological compression and reducing the chances of recurrence.

**References**