Sphenoid Sinus Osteoma at the Sella Turcica Associated with Empty Sella: CT and MR Imaging Findings

SUMMARY: A 50-year-old woman presented with intermittent headache for the past few years. A paranasal sinus CT scan showed a diffusely calcified lesion at the roof of the sphenoid sinus and sella turcica, with the sellar floor bony cortex involved. Empty sella was noted. MR imaging revealed a soft-tissue lesion with low signal intensity on T1-weighted images, high signal intensity on T2-weighted images, and heterogeneous enhancement on postgadolinium images. Histologic examination revealed an osteoma composed of mature lamellar bone.

Discussion

Osteoma is not common in the skull base. Sekhar et al.6 reported a surgical series of 49 tumors of the cranial base without mentioning osteoma. Derome and Vistot7 reported 124 skull base tumors in a surgical series of 49 tumors of the cranial base without mentioning osteoma. Previous authors have reported that the fronto-ethmoidal region was the most common site of osteoma, followed by the ethmoidal and maxillary sinuses.8,9 Sphenoid sinus osteoma is extremely rare,1 and skull base osteomas are rarely symptomatic. Their most common clinical presentations are, in decreasing order, headache, invasion and deformity of the orbit, pneumocephalus with possible rhinorrhea and meningitis, and, rarely, abscess formation.1 In this case, a sphenoid sinus osteoma was located on the sellar floor with sella turcica cortex involvement. The tumor was initially diagnosed incorrectly as an invasive pituitary adenoma by its particular location and nonspecific signal-intensity change on MR imaging.

Awareness of primary bony tumors in the skull base may help in arriving at a correct diagnosis. Osteoma could be composed of cancellous bone or more commonly of cortical bone.1 It is an uncommon slow-growing tumor in the skull base and is commonly asymptomatic. Osteochondroma usually presents as a pedunculated mass, most commonly in the tongue, head, or neck. It is a tumor with admixtures of bone and cartilage. Osteosarcomas in the head and neck occur most frequently in the second and third decades of life. These tumors generally present as localized painless expanding masses and more often occur in the maxilla than in the mandible. Histologically, osteosarcoma gives a picture of a sarcomatous stroma giving rise to osteoid, and the stromal cells display varying degrees of anaplasia, with variable pleomorphism as well.10 Ossifying fibroma is a gradually expansile well-marginated fibro-osseous lesion most commonly seen in jaw bones. Cranial occurrence of this tumor is extremely rare but has been reported in the sella turcica.11 Ossifying fibroma contains a uniformly cellular fibrous spindle cell growth arranged in a whorled or matted pattern with varying degrees of lamellar calcification.
bone formation in various stages of maturation. Capsule formation is an important feature to differentiate this from fibrous dysplasia and reactive bone formation.

In the present case, enlargement of the sella turcica on plain film was actually caused by the empty sella, not by the tumor. An empty sella is seldom associated with a tumor. Only a few cases of pituitary adenoma associated with empty sella have been reported before. The invasive character of pituitary adenomas might effect the destruction of the sellar floor, and then the tumor grows into the sphenoid sinus through the bone defect. A pre-existing empty sella having downward intrasellar pressure leads the tumor growing toward a relatively nonresistant extrasellar area. We believe that the osteoma of our patient arose from the sellar floor because of evidence of sellar cortex involvement, and it grew only downward into the sphenoid sinus because of the same downward intrasellar sellar cortex involvement, and it grew only downward into the sphenoid sinus.

Plain x-rays can help in the diagnosis of osteoma in the paranasal sinus. CT is important for characterizing and determining the extent of the tumor. Osteoma is exhibited as a well-defined high-attenuation mass, with attenuation values similar to those of the normal bone. MR imaging can be helpful for detecting adjacent dural or soft-tissue involvement. Tumor compression of surrounding tissues can be well delineated on 3 orthogonal images and, therefore, provides a good evaluation of the skull base, including the sellar area.

In this case, the osteoma was not radiopaque enough to be detected on plain films. Its rare location and nonspecific signal-intensity change on MR imaging led to an incorrect diagnosis. We suggest a combination of MR imaging and coronal CT for patients with suspected pituitary gland tumor with adjacent bone invasion, to rule out the possibility of a skull base bone tumor, such as osteoma.

References