Spinal cord compression and vertebral body metastasis diagnosed in correlation with TC-99m H/MDP scan

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Citation

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Abstract

69 yr old male with history of previously diagnosed prostatic carcinoma 5 years earlier presenting with elevated PSA levels and lower extremity weakness. Serum calcium and alkaline phosphatase were found to be elevated. No abnormalities were noted on plain film, however there were degenerative changes found on MRI to be highly suspect for metastatic disease significantly in the thoracic spine. Utilization of nuclear medicine bone scan was found to confirm suspicions of widespread bony metastatic disease . There is a significant expansile process encroaching upon the spinal cord at the T4 level with spinal cord compression explaning possible neurological affects to lower extremities. Prompt recognition of central canal encroachment caused by metastatic disease was lead to treatment and effective reduction of cord edema post diagnosis.

CASE REPORT

69 year old male patient presented upon routine followup with elevated PSA levels, elevated serum calcium and alkaline phosphatase upon consultation. Also noted was patients bilateral lower extremity weakness and recent history of fall. Initial plain film imaging proved to be non diagnostic, with further analyzation of MRI of the t-spine without contrast yielding abnormal findings from various vertebral bodies. Results were highly concerning for metastatic disease and positive findings of cord compression at the T4 level. MRI scan of the T-spine noted for an expansile process within the left pedicle of the vertebral T4 causing significant cord compression at that level. (Fig.1). Resultant abnormal signal at that level is suggestive of cord edema .

Figure 1

Figure 1: MRI T-spine demonstrating spinal cord compression

Evidence of Spinal canal stenosis can be clearly identified on a transverse view as evident of the lesion's significant enroachment. (Fig2).

Figure 2

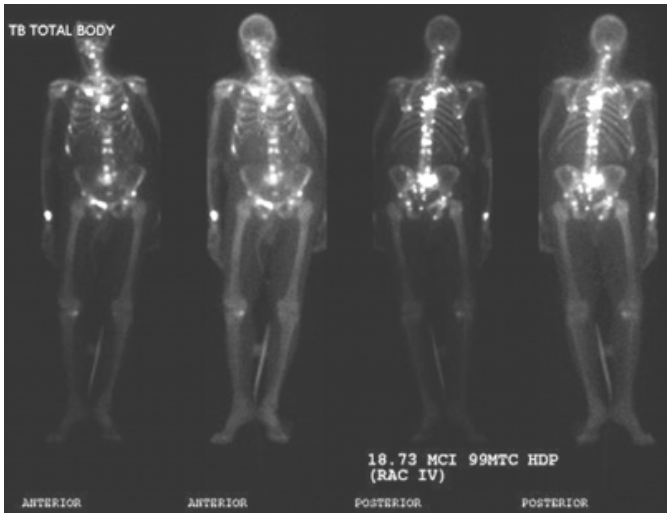
Figure 2: Transverse display

Initial bone scan 5 years previous performed for staging at initial diagnosis demonstrated no focal areas of increased radiotracer uptake concerning for metastatic disease.

Nuclear medicine bone scan demonstrated post review of MR shows various significant areas of uptake highly suggestive of widespread bony metastatic disease. There is an intense area of focus indicative of the metastatic lesion at the level of SCC which can be seen most evidently posteriorly. Additionally, there is markedly increased radiotracer activity to other areas of the spine as well as the pelvic bones and ribs. (Fig3). Foley catheter has been placed for drainage of urinary bladder activity.

Figure 3

Figure 3: Nuclear Bone Scan demonstrating widespread metastatic disease with prominent focal uptake seen in the vertebral bodies of the thoracic spine.



DISCUSSION

Compression of the spinal cord and nerve roots is found to be only second in prevalence to metastatic disease found in the brain. Neurological complications most commonly arrive from brain metastases.[1] Each year in the United States, approximately 20,000 persons with cancer develop SCC; this group represents 5% to 10% of the general cancer population.[2,3] Because of improved treatments and prolonged survival in various cancers, the incidence of SCC may be increasing.[4]

Neoplastic spinal cord compression usually follows hematogenous dissemination of malignant cells to the vertebral bodies, with subsequent expansion into the epidural space. Spread into the epidural space may occur by means of tumor extension through the intervertebral foramina or hematogenous spread by way of the Batson venous plexus. Generally, metastatic seeding appears in the thoracic spine (accounting for about 70% of cases), with the lumbar spine being the next most involved site (20% of cases). The cervical spine is affected in approximately 10% of cases. Multiple spinal levels are affected in about 30% of patients.[1] Malignant SCC can yield compressive indentation, displacement, or encasement of the spinal cord / thecal sac .[1] Spinal cord compression produces edema, inflammation, and mechanical compression, which causes direct neural injury to the cord, as well as vascular damage and impairment of oxygenation.[4] Prognosis of SCC also depends on the functional status and length of survival after

treatment. Spinal cord compression has demonstrated to be fatal only if it occurs in the cervical region of the spinal cord (C4 and above) and if it results in respiratory paralysis that is uncompensated by mechanical ventilation.[5] Tumor tissue type must be considered when the treatment plan is being determined. SCC in this case requires immediate treatment with either localized radiation , and or surgical intervention to prevent cord injury.[2,4,5] Subsequently, the patient underwent resection of encroaching tissue and vertebroplasty of multiple thoracic vertebrae to relieve the spinal cord compression and help relieve neurological symptoms. In vertebroplasty, a cement mixture consisting mostly of polymethylmethacrylate is injected through a needle into porous bone, with the porosity commonly caused by osteoporosis but also by malignancy as seen here .This cement reinforces the bone to reduce further fracture. [3] In this case, Bone scan was used in correlation with other modalities to confirm differential diagnosis of metastatic disease with spinal cord compression.

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