Case Report

Role of FDG PET/CT in Baastrup's disease

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ABSTRACT

Baastrup's disease is a benign condition, which presents as chronic low back pain. It is also known as "kissing spine syndrome" and refers to close approximation of adjacent spinous processes producing inflammation and back pain. This condition is often misdiagnosed, resulting in incorrect treatment and persistence of symptoms. Diagnosis of Baastrup's disease is verified with clinical examination and imaging studies. Conventionally, clinicians resort to magnetic resonance imaging (MRI) of spine rather than X-ray or computed tomography (CT) in the evaluation of back pain. MRI can additionally identify flattening, sclerosis, enlargement, cystic lesions, and bone edema at the articulating surfaces of the two affected spinous processes. Studies have reported that ^{18}Fluorine fluorodeoxyglucose-positron emission tomography/CT (FDG-PET/CT) can detect a bursitis or an inflammation as a form of stress reaction despite a negative MRI and ^{99m}Tc Methylene diphosphonate (MDP) bone scan. PET/CT is usually not a recommended investigation for this condition. However, this case report highlights the benefit of FDG-PET/CT in identifying the site of inflammatory pathology. It is also known to identify the exact site of inflammation where steroid or local anesthetic injection can be administered to alleviate pain, especially in patients with multilevel vertebral involvement.

Keywords: Baastrup's disease, bursitis, fluorodeoxyglucose-positron emission tomography/computed tomography, kissing spine syndrome, magnetic resonance imaging

INTRODUCTION

Back pain can occur due to excessive lordosis and degeneration and may involve vertebral bodies, intervertebral discs, facet joints including all the spinal elements such as flaval ligaments, interspinous ligaments, and posterior vertebral elements. Mechanical pressure to the back can cause repetitive strains of the interspinous ligament with subsequent degeneration and collapse of vertebral body. In addition, degeneration of a specific spinal element or a group of elements can result in further degeneration elsewhere in the spine.[1] Correct diagnosis and treatment of spinal pain requires a combination of clinical examination and imaging studies.[2] Till date, clinical examination and computed tomography (CT) or magnetic resonance imaging (MRI) were the only tools available to the clinician. Now, with the wider availability of positron emission tomography (PET) systems, fluorodeoxyglucose (FDG) serves as a robust marker to track infection and inflammation. PET/CT combination reveals the source of pain so that proper treatment to be selected. The close approximation of adjacent spinous processes with resultant further degeneration and inflammation was named after Christian Ingerslev Baastrup, a Danish radiologist (1855–1950) in 1933.[3]

CASE REPORT

A 66-year-old adult male presented with renal derangement, anemia, and recent onset of moderate to severe back pain. Patient was clinically evaluated and underwent MRI of lumbar

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spine. MRI of lumbar spine [Figure 1] reported T1-weighted and T2-weighted hypointense lesions of lumbar vertebrae along with degenerative changes. Based on MRI findings, further evaluation was suggested to rule out a marrow infiltrative disorder. Patient was referred for a whole body FDG-PET/CT to rule out multiple myeloma.

Whole body FDG-PET/CT [Figure 2] from head to mid-thigh showed abnormal increased FDG uptake in interspinous ligament between L3-L4 vertebrae and the L3-L4 spinous processes (standard uptake value, max 6.2). FDG uptake is appreciated in the apposing surfaces of the spinous processes on transaxial images that show enlargement, flattening, and sclerosis [Figure 3]. Degenerative changes of spine were noted apart from the mild irregularity of the spinous process of L3 with minimal enhancement of the interspinous ligament at L3-L4 level raising the possibility of Baastrup's syndrome. There were no other abnormal sites of FDG uptake in spine, other bones, lymph nodes, and organs.

DISCUSSION

Baastrup's disease usually affects elderly, over 70 years of age; commonly involves the lumbar spine, especially at L4-L5 level. It can affect spine at multiple levels also. There is no gender predilection. It usually starts as back pain with midline distribution that worsens during extension, is relieved during flexion and is exaggerated on local application of pressure at the affected spinal level. Diagnosis is based on clinical evaluation and imaging studies. This disease process usually results from excessive lordosis causing mechanical pressure and repetitive strains of the interspinous ligament with subsequent degeneration and collapse. Posterior ligaments are the first to be involved (sprained) as a result of extreme forward flexion followed by the interspinous ligaments. There may be spur formation and further inflammation of the adventitious bursa which is present in the interspinous space. Pain may be related to the impingement of nerves due to the inflammation and edema. In patients with Baastrups disease, FDG uptake may also be related to the development of highly vascularized granulation tissue/inflammation in response to injury at the junction of the interspinous ligament and spinous process (due to the inherent active metabolism of this region).

In <10% of the patients with symptomatic Baastrup's disease, MRI reveal lumbar interspinous bursitis, which is depicted as a fluid-like signal located between the pathological adjacent spinous processes.[4] The hallmark of imaging is the close approximation and contact of adjacent spinous processes, with all the subsequent findings including edema, cystic lesions, sclerosis, flattening and enlargement of the articulating surfaces, and bursitis. The interspinous bursa may extend between the ligamentum flavae in the midline forming an epidural cyst and further contributing to the already existing canal stenosis.[5] Our patient showed minimal enhancement of the interspinous ligament at L3-L4 level on the CT part of PET/CT with corresponding focal FDG

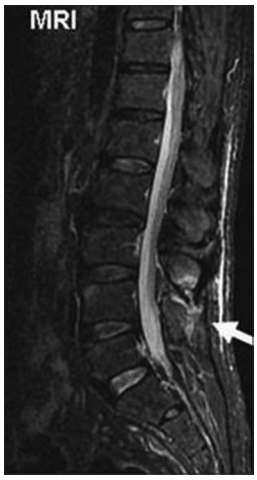

Figure 1: Magnetic resonance imaging (sagittal view) of lumbar spine showed ill-defined T1-weighted and T2-weighted hypointense lesions in lumbar vertebrae suspicious for marrow infiltrative disease. Cord signal appears normal

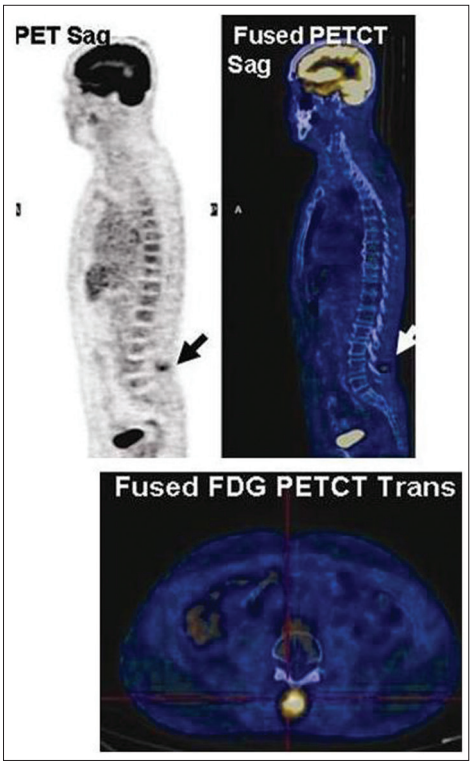

Figure 2: Whole body flurodeoxyglucose-positron emission tomography/computed tomography images showed abnormal increased flurodeoxyglucose uptake in interspinous ligament between L3-L4 vertebrae and the L3-L4 spinous processes (standard uptake value, ma × 6.2). Flurodeoxyglucose uptake is appreciated in the apposing surfaces of the spinous processes on transaxial images that show enlargement, flattening, and sclerosis. Degenerative changes of spine were noted apart from the mild irregularity of the spinous process of L3 with minimal enhancement of the interspinous ligament at L3-L4 level raising the possibility of Baastrup's syndrome. There were no other abnormal sites of flurodeoxyglucose uptake in spine, other bones, lymph nodes, and organs. Flurodeoxyglucose-positron emission tomography/computed tomography ruled out any flurodeoxyglucose avid marrow involvement

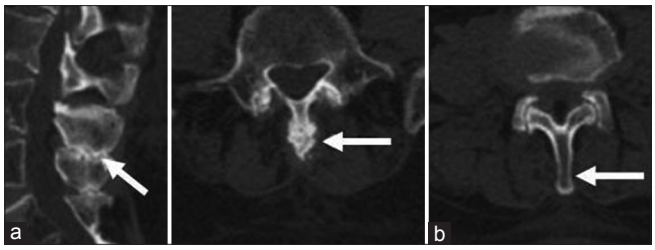

Figure 3: (a) High-resolution computed tomography images of the lumbar spine illustrating close approximation and contact of spinous processes at L4-L5 level with sclerosis, flattening, and enlargement of the articulating surfaces (white arrow). (b) Axial image in the same patient illustrating normal architecture of L2 spinous process (white arrow)

uptake suggesting local inflammation; however, there was no evidence of any localized fluid or cystic collection. Our patient underwent a 4-week trial of a nonsteroidal anti-inflammatory medication and stabilization exercises for the lumbar spine and was symptomatically better at 2nd month follow-up.

Baastrup's disease may occur in association with other degenerative factors such as loss of disc height, spondylolisthesis, and spondylosis with osteophyte formation. However, Baastrups disease as a single entity is also reported in the absence of the predisposing degenerative factors.[6] Apart from the conservative management with analgesics and nonsteroid anti-inflammatory drugs, the other therapeutic strategies include percutaneous infiltrations[7] with long-acting corticosteroids mixed to local anesthetics or surgical therapies such as excision of the bursa or osteotomy. Specifically for the percutaneous infiltrations, imaging guidance (PET or fluoroscopy) ensures accurate needle positioning with resultant increase of technical and clinical efficacy and at the same time decrease of potential complications rate. Surgery with either partial or total excision of the spinous processes does not always result in pain alleviation.

CONCLUSION

Utility of FDG-PET/CT in inflammatory diseases is well known. Here is another case illustrating its additional benefits in identifying back pain due to Baastrups disease; a disease due to close approximation of adjacent spinous processes resulting in inflammation of interspinous ligaments and bursa.

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Conflicts of interest

There are no conflicts of interest.

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