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# Evaluating back pain in older patients

## ABSTRACT

Low back pain in the elderly has a much wider range of possible causes than in younger patients. In addition to nonspecific mechanical causes, malignancy presenting as back pain occurs more often in older patients. Other systemic and visceral causes of back pain such as polymyalgia rheumatica, aortic aneurysm, Paget disease, Parkinson disease, and osteoporosis with compression fracture occur almost exclusively in persons over age 50. Keys to diagnosis and management of low back pain in older patients are presented.

## KEY POINTS

Four important areas to assess in older patients with back pain are the characteristics of the pain, presence of malignancy, history of nonspinal medical problems, and psychosocial status.

In an elderly patient, do not assume that back pain is due to degenerative changes in the disks and joints, changes which are nearly universal and frequently asymptomatic.

Two thirds of malignancies presenting as back pain are metastatic, most commonly from the breast, lung, kidney, or prostate.

**T**HE WIDE RANGE of potential causes of low back pain in the elderly makes its diagnosis and management more challenging than in younger patients. In younger patients the precise cause of pain tends to be nonspecific and is rarely identified. In older patients, too, back pain may be nonspecific, but the chance is greater for an association with a systemic condition or malignancy.

This article reviews key points of the evaluation of older patients with back pain and the major causes of acute and chronic low back pain (TABLE 1).

## DIFFERENCES BETWEEN OLDER AND YOUNGER PATIENTS

Low back pain in the elderly can have nonspecific mechanical causes, but it can also result from malignancy or from systemic and visceral causes (FIGURE 1). Systemic and visceral causes such as polymyalgia rheumatica, aortic

TABLE 1

### Causes of lower back pain in older patients

#### Acute lower back pain

- Lumbar strain or sprain
- Vertebral compression fracture due to osteoporosis
- Abdominal aortic aneurysm
- Polymyalgia rheumatica

#### Chronic lower back pain

- Aging-related degenerative disk and joint disease
- Malignancy
- Paget disease
- Fibromyalgia
- Diffuse idiopathic skeletal hyperostosis (DISH)

#### Predominant leg pain associated with back pain

- Trochanteric bursitis
- Osteoarthritis of the hip
- Lumbar canal stenosis

aneurysm, Paget disease, Parkinson disease, and osteoporosis with compression fracture occur almost exclusively in people over age 50. In older patients who also have associated leg pain suggestive of radiculopathy, other causes such as spinal canal stenosis and osteoarthritis of the hip should be considered in addition to intervertebral disk herniation.

Diagnostic imaging studies must be interpreted more cautiously in the older patient because irrelevant (false-positive) findings increase with age. In addition, medical and psychosocial comorbidity increases significantly with age.

Yet, despite the wider range of diagnoses for low back pain in the elderly, the principles of early medical management remain the same as for younger patients: ie, prompt recognition of serious causes, appropriate use of diagnostic imaging, identification of comorbidity, and identification of radiculopathy.

#### ■ KEY POINTS OF THE MEDICAL HISTORY

As in all patients with low back pain, evaluation begins with a careful history and physical examination. But a careful evaluation is even more crucial in the older patient because of the broader differential diagnosis and higher frequency of comorbidity.

Four important areas should be assessed when taking the history of the older patient with low back pain:

- Characteristics of the pain
- “Red flags” for cancer
- Nonspinal medical problems
- Psychosocial factors

#### Characterize the pain

**Location.** A key question is whether the pain is greater in the leg than in the back. Leg pain that radiates below the knee strongly suggests lower lumbar radiculopathy, with a sensitivity of 95% and a specificity of 85%.<sup>1</sup> Leg pain aggravated by walking and standing but relieved by sitting suggests spinal stenosis. Pain localized to the anterior thigh suggests upper lumbar radiculopathy or hip disease.

**Onset.** Knowing whether the pain is acute or insidious in onset is useful in narrowing the differential diagnosis. For example, degenerative mechanical pain typically has a gradual, slow

onset, whereas the pain of an osteoporotic compression fracture is usually sudden and severe.

**The effect of positional change.** Cancer pain tends to be constant, irrespective of body position. In contrast, patients with benign mechanical pain often find relief when supine and note increased symptoms when they move or change position. Most patients with leg symptoms due to spinal stenosis are more comfortable sitting.

#### Red flags for cancer

Malignant diseases are the cause of back pain in about 0.5% of unselected patients presenting for evaluation, but in patients over age 50, the frequency is as high as 7%.<sup>2</sup> In fact, more than 80% of patients with back pain associated with cancer are over age 50.<sup>3,4</sup>

Keep in mind the red flags of cancer when taking the history in an elderly patient with back pain:

- **Prior history of cancer.** About one third of patients with back pain due to malignancy have a prior history of cancer.
- **Pain that is usually constant, unrelied by rest or positional change.**
- **Pain at night that disturbs sleep,** noted in up to 90% of back pain patients found to have cancer.
- **Unexplained weight loss of more than 10 lb in 3 months.** This is not a common feature: it is seen in about 15% of patients with cancer-related back pain. Nevertheless, this sign is very specific. In contrast, patients with benign back pain of some duration often gain weight, presumably because of reduced physical activity.
- **Back pain that progresses despite appropriate treatment.** In contrast, benign acute back pain usually resolves in less than 1 month.

#### Nonspinal medical conditions

Several medical conditions may confound the diagnosis and affect treatment choices.

**Diabetes** afflicts as many as 15% of adults over age 45. Patients with diabetes frequently suffer peripheral vascular disease, which may superficially mimic the neurogenic claudication of spinal stenosis. Furthermore, they are at significantly increased risk of renal toxicity from nonsteroidal anti-inflammatory drugs

**Pain radiating below the knee suggests lower lumbar radiculopathy**



## ■ Causes of back pain in the elderly

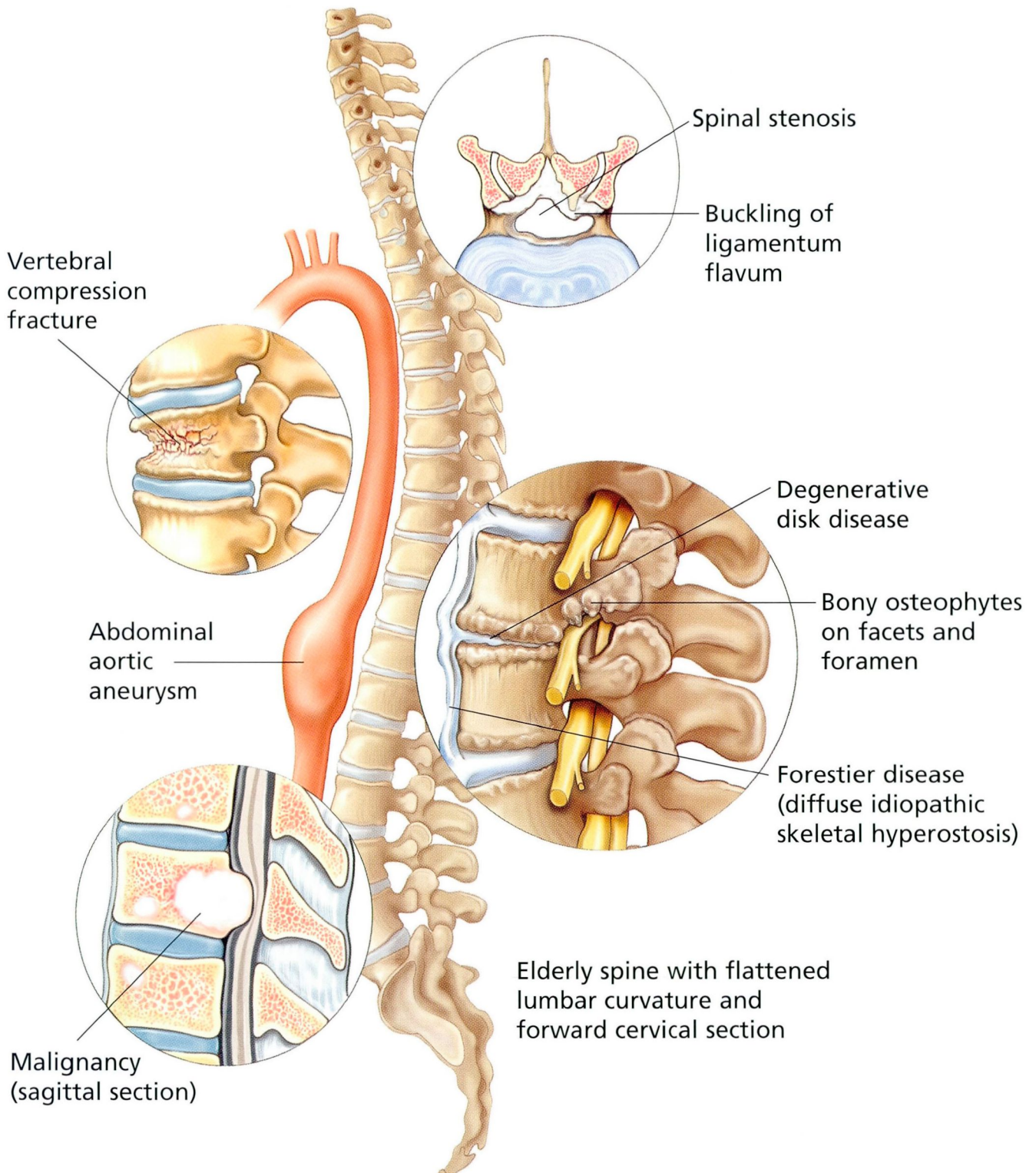
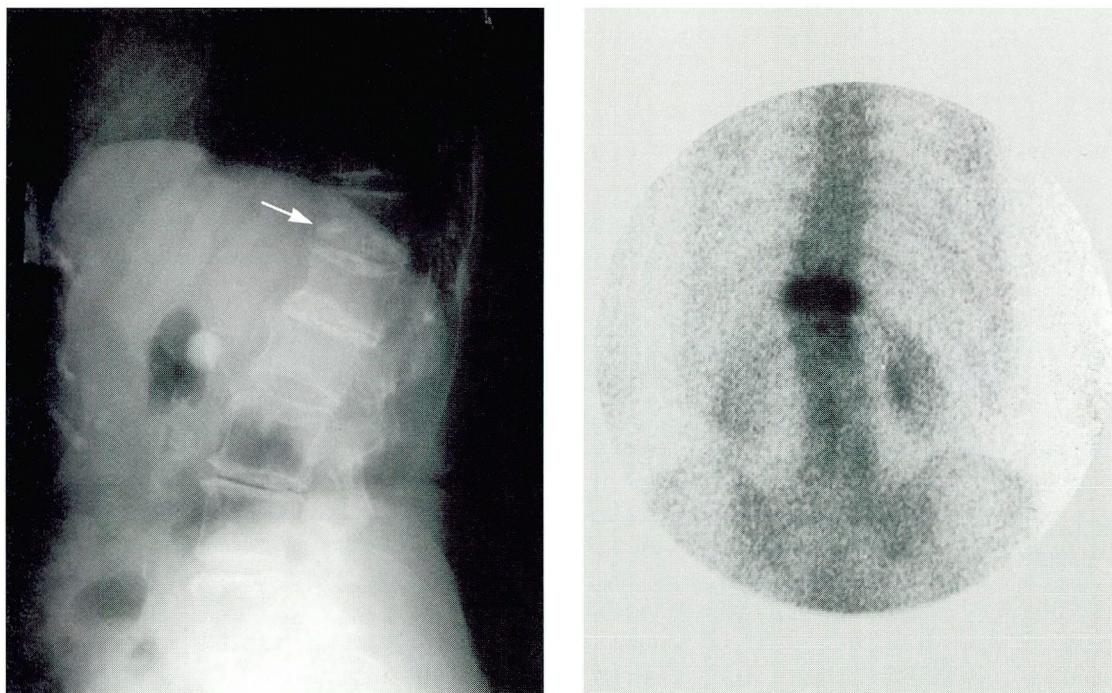


FIGURE 1



**FIGURE 2.** Radiograph (left) shows a vertical compression fracture (arrow) in an elderly patient. Bone scan (right) shows increased uptake in the acutely compressed vertebra.

(NSAIDs), which they often take to relieve back pain.

**Ischemic heart disease and congestive heart failure** place patients at similar increased risk of NSAID-related nephrotoxicity. Moreover, such patients may be less able or willing to comply with an active exercise physical therapy program for their back pain.

**Severe comorbidity** due to any cause may make elderly patients poor candidates for surgical treatment of spinal disorders.

### Psychosocial conditions

Nonorganic issues often complicate the management of low back pain in persons of all ages. These issues include job dissatisfaction, coexisting psychiatric disorders that antedate the back pain (depression, anxiety, substance abuse), and secondary financial gain (personal injury litigation, worker's compensation).<sup>5</sup>

Recognizing these complicating factors may be more difficult in the older patient. For example, comorbid illness and organic functional impairments may mask depression. Certain psychosocial issues are much more

common in elderly patients. For example, the ability to live and function independently may be impaired, or conversely, the older person may be the sole significant caregiver for an impaired spouse. Common issues affecting compliance with treatment are lack of transportation or the inability to leave an ill spouse alone at home.

### Assessing functional capacity

Mental and physical function must be carefully assessed. For a frail elderly patient, the onset of back pain may seriously compromise already-marginal functional status. Such patients may require expanded social service intervention. Medical treatment is limited in such patients, and we cannot realistically expect compliance with a therapeutic exercise program. Even mild cognitive impairment (eg, dementia) significantly limits therapeutic choices.

### ■ THE PHYSICAL EXAMINATION

Though the physical examination of the elderly patient includes observations and maneuvers performed in all age groups, certain areas deserve special emphasis. For exam-

**Recognizing complicating psychosocial issues is more difficult in older patients**

ple, the examination should include careful observation of spinal posture for increased thoracic kyphosis, characteristic of vertebral compression deformation. Increased muscle tone and stiffness may suggest unrecognized Parkinson disease presenting as bone pain. In patients with leg pain, assessment of distal pulses is important in distinguishing vascular claudication from neurogenic claudication.

### ■ CAUSES OF ACUTE LOW BACK PAIN IN THE ELDERLY

#### Lumbar strain or sprain

Muscular and ligamentous strain is a frequent source of back pain. Age-related changes in the lumbar intervertebral disks, facet joints, and ligaments biomechanically alter the spine and often reduce mobility. As a consequence, supporting myofascial tissues are often tighter and at greater risk for strain or stretch injury. These same muscles are often deconditioned in a less-active elderly patient and are more prone to fatigue, which exacerbates pain.

Back pain from muscular and ligamentous strain and fatigue is augmented in patients with one or more vertebral compression fractures and resulting spinal deformity (typically kyphosis).

The pain of myofascial strain is frequently acute and usually reduced in the supine position. Muscular fatigue pain associated with spinal deformity (eg, increased kyphosis resulting from multiple compression fractures) begins gradually with prolonged standing and is also relieved in the supine position.

#### Vertebral compression fracture

Osteoporosis is common in older persons, particularly women. As a result of osteoporotic changes, vertebral compression fractures may occur spontaneously or with minimal trauma. The pain is acute and aggravated by movement. Patients are most comfortable when motionless.

Plain lateral spinal radiographs reveal anterior compression with “wedging” of the vertebra, but radiography is not helpful in clarifying the acuity of the fracture unless recent prior films are available for comparison. If clinically warranted, a bone scan or magnetic resonance imaging (MRI) usually distinguishes acute from older fractures (FIGURE 2).

#### Abdominal aortic aneurysm

Abdominal aortic aneurysms are present in up to 4% of persons over age 50, more commonly in men and more frequently in persons with evidence of peripheral vascular disease (ie, claudication).<sup>6</sup> While most patients are asymptomatic, 10% to 15% of patients have back pain, often associated with abdominal pain, radiating to the hips and thighs. Aneurysm rupture is associated with a sudden dramatic increase in pain.

A pulsatile abdominal mass may be felt in half of affected patients. Anteroposterior and lateral lumbar spine films reveal curvilinear aortic calcification in up to 70% of patients. Abdominal ultrasound or computed tomography (CT) is nearly 100% sensitive.<sup>7</sup> CT can also identify a rupture or a contained leak.

#### Polymyalgia rheumatica

Polymyalgia rheumatica is characterized by the sudden (often overnight) onset of pain and stiffness in the neck, upper back, shoulders, lower back, buttocks, and hips, usually in persons over age 50.<sup>8</sup> Prevalence increases with age, and women are more commonly affected than men. Giant cell arteritis is found in about 40% of patients with the syndrome, manifested by headache, visual disturbances, jaw claudication, or systemic signs.<sup>9</sup>

The clinical diagnosis of polymyalgia rheumatica is supported by a Westergren sedimentation rate greater than 40 mm/hour. A dramatic response to a trial of low-dose prednisone confirms the diagnosis.

### ■ CHRONIC LOW BACK PAIN IN THE ELDERLY

#### Degenerative disk and joint disease

Degenerative disk and joint changes are common in older patients. Spinal radiography, CT, and MRI frequently demonstrate disk bulging or protrusion and spinal stenosis, even in persons with no symptoms. Therefore, when evaluating back pain in the older patient, care must be taken to avoid erroneous attribution of back pain symptoms to these frequently asymptomatic and near-universal degenerative changes.

**Pathology.** With increasing age, progressive degenerative changes occur in the three

Symptoms of degenerative back pain are often insidious in onset

components of the spinal segment—the intervertebral disk, the paired facet joints, and the vertebral body. The water content and resiliency of the disk decrease, resulting in increased vulnerability to shear and compressive stresses. Ultimately, the disk material thins, contributing to overriding of facet joints and telescoping of neuroforamina.

Simultaneously, osteoarthritic changes occur in the facet joints, with fissuring, fraying, and erosion of the cartilage. These changes are accompanied by subchondral sclerosis and the formation of bony osteophytes. In some patients, the degenerative cascade is compounded by osteoporotic anterior vertebral collapse.

These aging-related degenerative spinal processes adversely affect spinal ligamentous structures as well. The ligamentum flava buckle into the spinal canal with progressive loss of disk height. The interspinal ligaments and joint capsules bear increased stress as a consequence of underlying bony and disk changes.

**Symptoms** of degenerative back pain are typically insidious in onset and mechanical in character. Pain increases with movement and prolonged activity and is relieved by rest. On examination, increased thoracic kyphosis may be found and limited lumbar mobility is common. Change of position is often painful.

### **Malignancy**

Two thirds of cancer cases presenting as back pain involve metastatic disease, most commonly from the breast, lung, kidney, or prostate. Multiple myeloma is the most common spinal malignancy. Nonspinal malignant diseases such as pancreatic carcinoma, renal cell cancer, intrapelvic tumors, or lymphoma with retroperitoneal lymphadenopathy may present with back pain.

The Westergren sedimentation rate is the single most useful laboratory screening test for malignant back pain. In 78% to 94% of patients with back pain who are found to have cancer,<sup>3,4</sup> the Westergren sedimentation rate is greater than 20 mm/hour. Plain lumbar radiography is only about 65% sensitive in detecting malignancy as a source of back pain.<sup>10</sup> Both CT and MRI are very sensitive (95%) but MRI is preferred because it displays a greater portion of the spine. The bone scan

has similar sensitivity but may be normal in patients with multiple myeloma.

### **Paget disease**

This common disorder of bone is found in up to 3% of adults over age 40, increasing to 10% of those over age 80. Though most persons with Paget disease have no symptoms, up to 40% of those who report discomfort have back pain. Spinal pain from Paget disease may be bone pain—deep, aching, and constant—or arthritic. Juxtaarticular pagetic deformities can accelerate the process of degenerative joint disease and contribute to spinal symptoms. Nerve entrapment from pagetic bony overgrowth may cause radicular pain in rare patients.

Localized enlargement of bone is the most characteristic radiographic feature of Paget disease.<sup>11</sup> This feature is helpful in distinguishing Paget disease from other bony disorders that produce back pain and sclerotic findings on radiographs, including metastatic disease, particularly prostatic carcinoma. Other radiographic features may include osteolytic V-shaped lesions in long bones, cortical thickening, coarsened trabeculae, and osteoporosis circumscripta in the skull.

Radionuclide bone scanning is more sensitive than plain radiography in identifying pagetic lesions. Typically, serum alkaline phosphatase, a marker for osteoblastic activity, is elevated, except in disease affecting only a single bone. Urinary hydroxyproline, a marker for osteoclastic activity, is also usually increased. An even more specific indicator of increased bony resorption, urinary excretion of pyridinoline or deoxypyridinoline, is also increased.<sup>12</sup>

### **Fibromyalgia**

Fibromyalgia, a syndrome of widespread musculoskeletal pain and tenderness in a variety of characteristic sites, affects about 2% of the US population. Recent information suggests that the prevalence of fibromyalgia increases with age, peaking at more than 7% in women over age 70.<sup>13</sup> Low back pain is a common feature of fibromyalgia; in one study,<sup>14</sup> 12% of patients ages 34 to 67 evaluated for back pain were found to have fibromyalgia.

The diagnosis of fibromyalgia is based on the symptoms. The pain of fibromyalgia is dull,

**Pseudoclaudication is the classic symptom of lumbar canal stenosis**

aching, and often described as flu-like. Patients may be sensitive to weather changes and may have disrupted, nonrestorative sleep and marked fatigue. Psychological distress is common. Headache and irritable bowel symptoms often coexist. Laboratory studies are unrevealing. Radiographs are normal. Some patients with cervical pain demonstrate straightening of the cervical spine on the lateral cervical radiograph, characteristic of muscle spasm.

Diagnostic criteria for fibromyalgia were defined by the American College of Rheumatology in 1990 and include, first, widespread pain, and second, pain in at least 11 of 18 defined tender points.<sup>15</sup> In the older patient, the differential diagnosis includes masked hypothyroidism, Parkinson disease, polymyalgia rheumatica, and malignancy.

#### **Diffuse idiopathic skeletal hyperostosis**

Diffuse idiopathic skeletal hyperostosis (DISH), also known as Forestier disease, is characterized by exuberant ossification of spinal ligaments. More common in men, DISH occurs in persons over age 50 and may be seen radiographically in up to 10% of persons over 65.

The etiology of DISH is not known. Some consider it a variant of osteoarthritis. The incidence is higher in persons with diabetes. Stiffness in the back is the primary symptom. Pain, most often in the thoracolumbar region, occurs in about half of affected persons.

Plain radiographs that reveal flowing anterior calcification along at least four contiguous vertebrae confirm the diagnosis. Disk height is preserved. Sacroiliac joints are not involved, though the appearance superficially resembles spondylitis. Tests for acute-phase reactants are normal.

#### **EVALUATING LEG PAIN IN THE OLDER PATIENT**

Suspect radiculopathy in an older patient with leg pain that predominates over back pain, particularly when symptoms radiate below the knee. The condition most commonly results from intraspinal nerve entrapment. However, particularly in an older patient, nonradicular, nonspinal causes of leg pain should be considered. These conditions, which may produce

“pseudosciatica,” include trochanteric bursitis and osteoarthritis of the hip.

#### **Trochanteric bursitis**

Trochanteric bursitis is a common nonarticular cause of aching pain in the lateral aspect of the hip; in about 40% of patients, this pain extends down the lateral aspect of the thigh.<sup>16</sup> Many patients are unable to lie on the affected side because of increased pain.<sup>17</sup>

The diagnosis is confirmed by physical examination revealing direct tenderness over and around the greater trochanter. Pain may be provoked by forced hip abduction. Radiographs occasionally reveal calcifications around the trochanter.

#### **Osteoarthritis of the hip**


Hip joint pain is felt in the buttocks, groin, or anterior thigh, at times radiating to the knee. This pattern of pain resembles that of upper lumbar (L2 or L3) radicular pain. The physical examination helps distinguish between these two conditions. In individuals with hip disease, the examiner can elicit the pain with internal and external rotation of the hip. Often, there is significant loss of mobility in the hip joint as well. Confirmatory radiographs demonstrate joint space narrowing and subchondral sclerosis with osteophyte formation in many patients.

#### **Lumbar canal stenosis**

In the older patient, spinal stenosis—ie, reduced diameter of the central spinal canal—is often a consequence of degenerative spinal changes including facet joint hypertrophy, bulging or herniation of the intervertebral disc, and thickening and buckling of the ligamentum flavum. This condition is now the most common reason for spinal surgery in patients over age 65.

The diagnosis is primarily based on the clinical history. The classic symptom of stenosis is pseudoclaudication. Patients describe pain, numbness, weakness, or heaviness in one or both legs that is provoked by walking or standing and relieved by sitting or forward flexion. Some patients describe the “grocery cart sign,” noting that they manage to finish their shopping only by progressively leaning forward against the cart.<sup>18</sup>

**Trochanteric bursitis and osteoarthritis of the hip can mimic sciatica**

Physical findings are often unimpressive. The development of posterior thigh symptoms after 30 seconds of lumbar extension is a useful provocative test for stenosis.<sup>19</sup> Imaging studies (CT or MRI) confirm the diagnosis. Clinical correlation with imaging studies is critical because anatomic spinal stenosis may be present on MRI in asymptomatic patients, particularly those over age 60. 

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