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Acute onset-low back pain and hip pain secondary to metastatic prostate cancer: a case report

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Prostatic cancer is the second most common cancer among North American men and the second leading cause of cancer deaths. It may be incidental or contribute to the cause of mechanical back pain. With such high mortality associated with metastasis, early detection is essential for appropriate medical management. Chiropractors are often consulted for back pain of mechanical origin and are in a position to detect conditions in which serious organic pathology may contribute to, or mimic benign musculoskeletal back pain. Patient history and clinical examination coupled with imaging may greatly increase the index of suspicion of prostatic involvement. Outlined is a case where imaging and examination confirmed a diagnosis of organic disease in an individual who opted for chiropractic care for his back pain, but for whom immediate medical management was essential.
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KEY WORDS: chiropractic, low back pain, hip pain, prostate, metastasis.

Le cancer prostatique est le deuxième type de cancer le plus répandu chez les hommes nord-américains et la deuxième cause de décès par cancer. Il peut être lié ou être la cause de douleur lombaire de nature mécanique. Le taux de mortalité associé aux métastases est si élevé qu'une détection précoce est essentielle à une prise en charge médicale appropriée. Les chiropraticiens, souvent consultés pour des maux de dos d'origine mécanique, sont en mesure de différencier une condition causée par une pathologie organique grave d'un mal de dos musculosquelettique bénin. Les antécédents du patient et un examen clinique jumelés à un test par imagerie peuvent grandement augmenter l'indice de suspicion d'un problème prostatique. L'article illustre un cas où l'imagerie et l'examen ont confirmé le diagnostic de maladie organique chez un individu qui avait opté pour des soins chiropratiques pour soigner ses douleurs lombaires, mais pour qui une prise en charge médicale immédiate était nécessaire.
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MOTS CLÉS : chiropratique, lombalgie, coxalgie, prostate, métastase.

Introduction

Prostate cancer is the most common cancer among North American men (excluding skin cancer) and the second leading cause of cancer deaths after lung cancer.[1] African-American males have approximately 60% higher incidence rate of prostate cancer than Caucasian males.[2] Native American males have the lowest incidence rates.[2] Although it can occur at any age, it is most often found in men over the age of 65. In men over the age of 75, the disease is usually slow to progress and is unlikely to cause serious problems. In others usually younger patients, the disease is very aggressive and requires treat-

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ment.[1] One of the late manifestations of this disease is bone pain, by way of skeletal metastasis.[3] Those affected may present complaining of low back pain or other musculoskeletal pain to chiropractors. Chiropractors, being primary health care providers, are responsible for rendering a diagnosis, and if management is beyond their scope of practice they are obligated to make a prompt referral for medical management.

This is a report of an atypical presentation of a middle-aged male with undiagnosed skeletal metastasis secondary to prostatic adenocarcinoma, who consulted a chiropractor for his low back and hip pain.

Case

A 55-year-old Caucasian male presented to a chiropractic office complaining of generalized, low grade right hip and sacroiliac pain. It began without incident several weeks prior and was reported to be slightly worse. The involved area was mildly tender to touch. The patient could recall no local bruising or swelling. He had not experienced any radiation into the lower extremities. Coughing and sneezing were non-provocative. He had not experienced bowel or bladder problems. He denied any recent illness, diet or weight changes, or other constitutional symptoms.

The gentleman was employed as a taxi driver. He stated that in the last few weeks prolonged sitting caused right hip and lower back stiffness and discomfort. Rest provided some relief. He had attended for chiropractic care sporadically over the years for lower back complaints, which he reported would resolve after a short course of treatment.

This patient presented without signs of acute distress or antalgia. His gait and postural examination were essentially unremarkable. Hypertonicity was detected over the lumbar paraspinal musculature, bilaterally. Orthopaedic evaluation of the lower back and hip was consistent with findings of right sacroiliac joint dysfunction. Neurological examination was unremarkable. Regional x-rays of the area of complaint were taken due to his age and chronic recurrent symptoms.

Radiographic findings

A sclerotic lesion was visualized involving the right iliac bone extending 4cm upward from the superior aspect of the acetabulum, and involving the full width of the bone (5 cm). (See Figures 1 and 2) Involvement of the superior aspect of the acetabular articular surface was visualized. There was no expansion of the bone. The cortex was slightly indistinct medially. The lesion itself was mottled in texture and quite sclerotic.

CT imaging

The patient was referred for a CT scan to further clarify

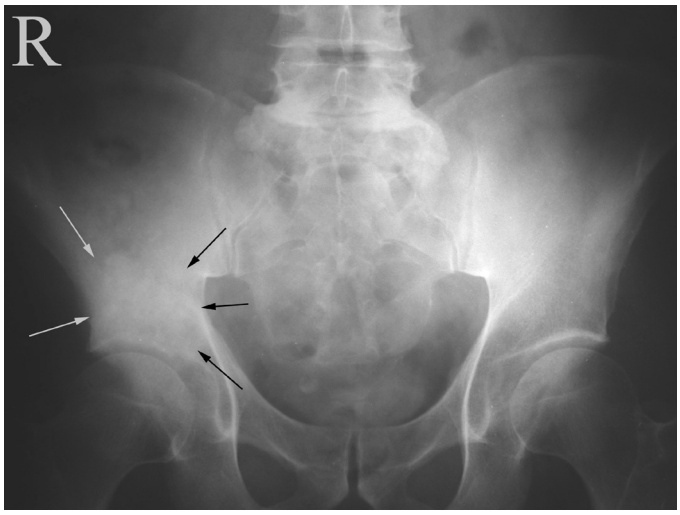

Figure 1 Sclerotic lesion involving right iliac bone.

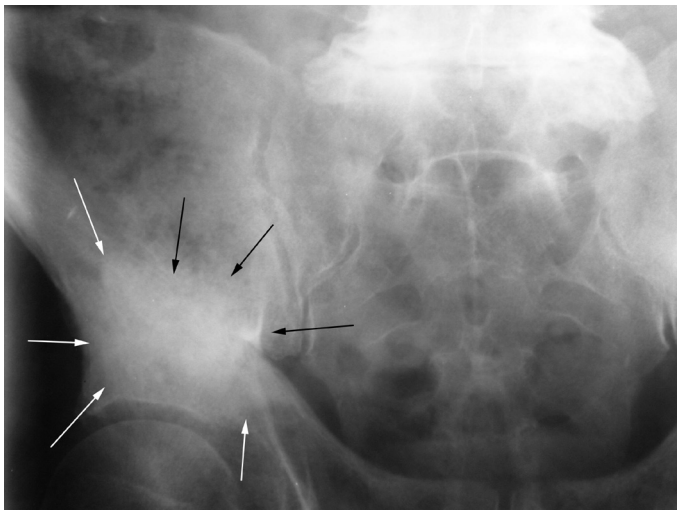

Figure 2 Sclerotic lesion involving right iliac bone.

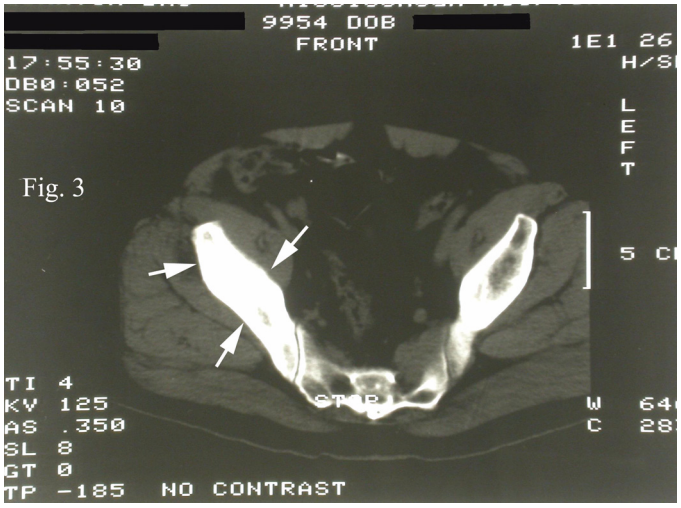

Figure 3 CT scan demonstrates superior extension of lesion.

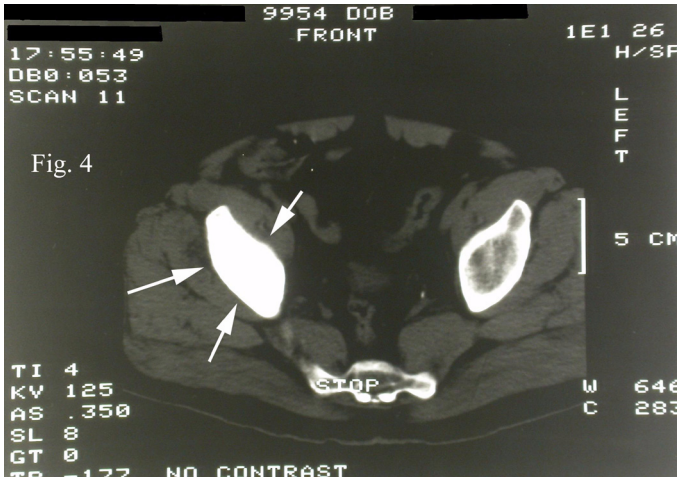

Figure 4 CT scan exhibits homogenous osteoblastic activity.

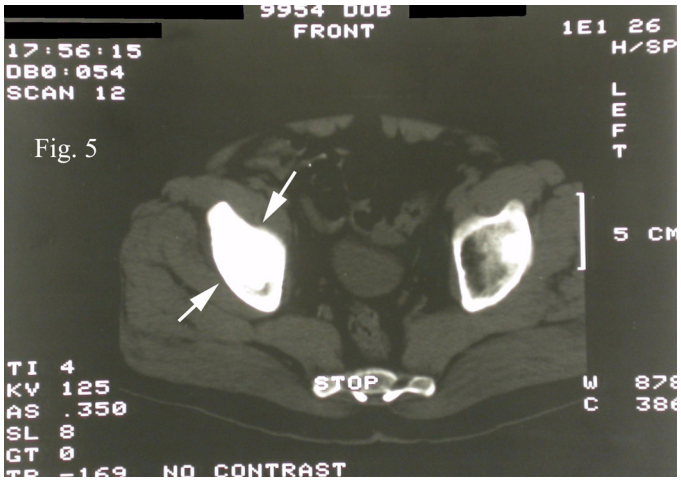

Figure 5 CT scan demonstrates mottled presentation.

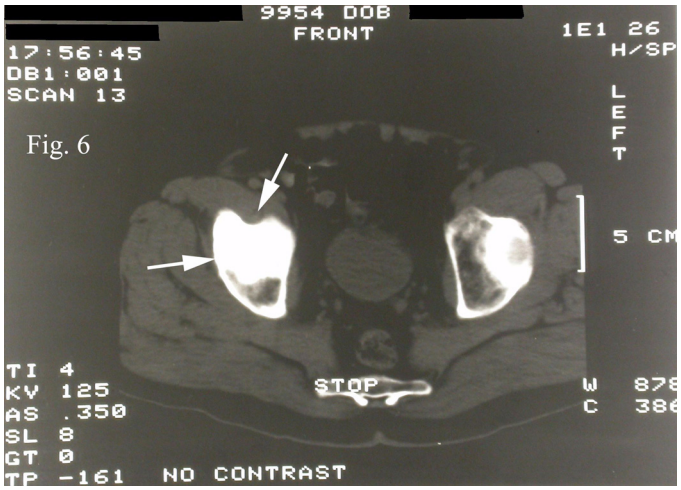

Figure 6 CT scan demonstrates mottled presentation.

the extent of the lesion. Figure 3 (scan 10) demonstrates the most superior extension of the lesion involving the central-anterior portion of the ilium adjacent to the inferior aspect of the sacro-iliac articulation. Figure 4 (scan 11) exhibits homogenous osteoblastic activity involving virtually the entire section of ilium, while Figure 5 (scan 12) and 6 (scan 13) demonstrate a more mottled presentation in the area just superior of the right acetabulum. Another lesion is visualized over the lateral aspect of the left ilium in Scan 12 and 13.

The most likely etiology is a neoplasm of the bone, either primary or secondary. The possibilities include chondrosarcoma, lymphosarcoma, and metastatic prostatic carcinoma.

The patient was subsequently found to have metastatic prostatic adenocarcinoma and was treated with chemotherapy and radiation treatment. One year later the patient was said to be in "good health". He was pleased with his initial diagnosis.

Discussion

This case is of interest due to the unusual presentation of metastatic disease that presented itself as mechanical low back pain and hip pain.

In many instances, a patient with metastatic disease complains of night pain, intense pain at rest and unexplained weight loss.[4] Typically, patients with prostate cancer describe symptoms of bladder outlet or ureteral obstruction causing reduced urine stream, increased frequency and urgency.[1] Hematuria and pyuria may also occur.[1] The patient discussed here did not report any symptoms that directed the chiropractor to a primary diagnosis of prostatic metastasis. The chiropractor's index of suspicion, however, was heightened due to the patient's age, lack of significant mechanism of injury and the chronic, recurrent symptom presentation. The chiropractor opted for lumbar spine radiographs before proceeding with treatment.

Risk factors

A distinct etiological factor for prostatic carcinoma has not been identified. Known risk factors include: advanced age, previous cancer, hormonal influences and heredity.[1] It has been suggested that there may be an autosomal dominant inheritance in over 40% of cases in individuals under fifty-five years of age.[1] The degree and number of family relatives, who have been diagnosed with prostate cancer, will help determine the relative risk of developing this condition by the patient. For instance, if one first- degree relative has the disease, the relative risk is 2.2, however, if three first-degree relatives have prostate cancer then the relative risk increases to 10.6.[1] Environmental factors have been suggested to have a causal link. These include high dietary fat and high red meat content as well as low sun exposure and decreased vitamin D.[1] Vasectomies have had a questionable significance.[1]

Anatomy and pathophysiology

The prostate gland is a walnut-shaped organ that is located caudal to the bladder and anterior to the rectum, encircling the superior portion of the urethra.[5] It produces and stores seminal fluid, which bathes and nourishes sperm. The prostate gland requires testosterone to function properly. It helps regulate bladder control and normal sexual functioning.[5]

The gland can be separated into distinct anatomic and physiologic regions. Tumors arising in the peripheral zone of the prostate account for 75–80% of all cases.[1] If they are configured into a nodule in the periphery, they may be palpated by digital rectal examination (DRE). However, this is not always the case. The remainder of the lesions arise in the central prostate gland, which comprises of the central and transitional zones.[1] The transitional zone is the area of the prostate that classically enlarges with age and can account for the development of benign prostatic hyperplasia.[1]

Staging and grading

Stage and grade are correlated: as the grade becomes less differentiated the stage is likely to be more advanced.[2] There are several grading and staging systems used to categorize prostate tumours. The Gleason scale is a well-

Table 1
The Gleason grading scale

Low grade	2-3-4	Slow growth Well-differentiated
Medium grade	5-6-7	Unpredictable growth Moderately differentiated
High grade	8-9-10	Aggressive growth Poorly differentiated

Table 2
TMN Clinical staging system for prostate cancer

Stage 1	– a small tumor is confined to the prostate (not detected during a digital rectal exam) – this stage usually produces no symptoms
Stage 2	– the tumor is confined to the prostate gland but may be detected during a digital rectal exam (capsular) – possible symptoms may include a need to urinate frequently, especially at night
Stage 3	– the tumor has begun to spread beyond the prostate gland (extracapsular)

known grading system. It reflects aberration in glandular architecture (Table 1). The tissue samples, taken from the prostate during biopsy, are examined histologically. A grade of one (low grade) to five (high grade) is assigned to the two most common patterns of cancer seen under the microscope: the appearance of the cells (on a scale of 1 to 5); and their arrangement (on a scale of 1 to 5). These two numbers are then combined to give a Gleason grade score of 2–10.

A common system used by physicians to determine the stage of the prostate cancer is the TMN (tumor, node, metastasis) system. Cancer is staged according to: the type of tumor, tumor spread to the lymph nodes, and tumor spread to distant sites (Table 2).

Examination procedure

The digital rectal examination (DRE) involves manual palpation of the prostate gland via the rectum. The posterior aspect of the prostate comes in contact with the digit, which then can be assessed for size, contour, consistency and mobility of the gland.[6] In a normal prostate, the examiner should be able to feel for the lateral lobes and the median sulcus.[6] A cancerous prostate gland is hard, nodular, and the sulcus may be obliterated.[6] Unfortunately, the anterior wall of the prostate cannot be assessed using this method and pathological features may be missed. A DRE alone has been found to have a low positive predictive value (25%) for cancer detection. However, Crawford et al.[7] found that adding Prostate Specific Antigen (PSA) screening improved the probability of detecting cancer by at least 59% over DRE alone. The positive predictive value for prostate cancer detection was highest in patients with PSA levels greater than 4 ng/mL and an abnormal DRE (46.6%).[7]

Digital rectal examinations for the purpose of prostate palpation, although taught as part of the chiropractic core curriculum, are not permissible under the Regulated Health Professions Act (1991)[8] and Chiropractic Act (1991)[9] in Ontario. Chiropractors must consult their regulatory body and legislation for details regarding this procedure.

Laboratory tests

Prostate Specific Antigen (PSA)

PSA is an enzyme produced by the ducts of the prostate gland and absorbed into the bloodstream. In the blood it may become bound to two proteins, actichymotrypsin and alpha macroglobulin. The serum PSA test measures the level of free and bound PSA in the blood.[1] Normally, the level of PSA detected in the blood is between 0.0 and 4.0 ng/ml.[1] Most men who have been diagnosed with prostate cancer have a PSA level greater than 4.0ng/ml.[1] The test has a reported sensitivity (the probability that a person having the disease will be correctly identified by a clinical test) of up to 80% in detecting prostate cancer but it lacks specificity (the probability that a person not having the disease will be correctly identified by a clinical test).[10] Other non-malignant conditions that increase PSA levels include: benign prostatic hyperplasia, urinary tract infections, prostatitis or any other condition or diagnostic test that might irritate the gland. Thus, false positive results are common. Studies have found that between 25–46% of men with benign prostatic hypertrophy have elevated PSA values.[11,12]

The positive predictive values of PSA screening studies is reported to be between 28–35%, which means only one third of the men with elevated PSA (>4ng/ml) will be found to have prostate cancer on biopsy and two thirds will not.[10] A criticism of these studies is that participants are either seen at urology clinics or community volunteers, thus the positive predictive value maybe even lower when screening occurs in primary care settings.[13]

The issue of clinical importance has been raised when it comes to PSA screening. Autopsy studies suggest that 30% of men over the age of 50 have latent prostate cancer that is unlikely to produce symptoms or affect survival.[10,13] Thus, population screening would preferentially identify these latent cancers and many thousands of men who are more likely to die of other causes (e.g., coronary artery disease) would be subjected to unnecessary testing and treatment of prostate cancer. Humphreys et al.[14] suggest that cancers detected through PSA screening may be more aggressive and clinically important than the latent cancers found on autopsy. Presently, there are no prospective randomized studies showing evidence that mass screening with DRE and PSA for prostate cancer in

asymptomatic males will reduce the mortality or morbidity rate from the disease.[15,16]

In 1995, recommendations against PSA screening were issued by the Canadian Task Force on the Periodic Health Examination and the Canadian Urologic Association.[17] The most recent position statement from the Canadian Cancer Society regarding prostate cancer screening recommends that "all men over the age of 50 years should discuss with their doctor the potential benefits and risks of early detection using PSA and digital rectal examinations so they can make informed decisions about the use of these tests".[18]

Prostate Acid Phosphatase

Although this enzyme is widely distributed in bodily tissues, its activity is one hundred times higher in the prostate gland.[19] Elevated prostatic acid phosphatase has a high specificity for detecting metastatic disease.[19] It is estimated that elevation occurs on average in 75–80% of those with bone metastasis.[20] Acid phosphatase is reported to be elevated in about 5–10% of patients with benign prostatic hypertrophy without any evidence of carcinoma.[20]

Radiographic imaging

Adenocarcinoma represents the most common form of prostate cancer and the most aggressive.[21] Regional lymph nodes are the most frequent sites of metastasis, followed by bone. The bone sites most commonly involved include: spine, femur, pelvis, ribs, sternum, skull and humerus.[3] The lesions generally present as osteoblastic (80%) but may appear osteolytic (5%) or mixed (15%).[3] An osteoblastic presentation represents normal, albeit exuberant, new bone formation in response to invading/proliferating tumor.[22] Metastasis to bone is facilitated by direct extension or hematogenous/lymphatic dissemination. The proximity and extension of Batson's venous plexus makes distal axial seeding of carcinoma cells probable.[22] The importance of radiographic evaluations of patients with suspect complaints cannot be overemphasized, since clinical signs may be absent in the course of the disease, especially during earlier stages.

Special imaging

Unfortunately, by the time radiographic findings are visible the stage of the prostate cancer has progressed significantly. Thus, abnormal findings on the DRE and serum PSA should prompt the clinician to refer the patient for special imaging. These may include cystoscopy, transrectal ultrasound, CT and MRI studies.[23]

Transrectal ultrasound (TRUS) can be used to determine the clinical stage of the prostate cancer or guide a biopsy.[24] A small, lubricated probe placed into the rectum releases sound waves which create echoes as they enter the prostate. Prostate tumors have been found to create echoes which are different from normal prostate tissue. These echoes bounce back and are sent to a computer that translates the pattern of echoes into a prostate picture.[25] Since its development[26] for evaluating the prostate gland, the technique has become much more advanced.[25] The TRUS-guided prostate biopsy has become a standard technique in the diagnosis of prostate cancer.[25] TRUS evaluation of the prostate also has its limitations. Rifkin and Choi[27] found that in radical prostatectomy specimens, only 36% of non-palpable tumors were visualized on ultrasound. Lee et al.[28] found that the specificity of the classic hypoechoic ultrasound finding of prostate cancer was low. The positive findings can be due to a normal gland, prostatitis or prostate neoplasia. Nevertheless, Applewhite at al.[25], in their review of TRUS and biopsy in the early diagnosis of prostate cancer, concluded that TRUS maintains a critical role.

Magnetic resonance technology is also rapidly evolving in the area of prostate cancer staging.[29] Ikonen et al.[30] studied MR imaging accuracy in differentiating between cancer or other prostatic disorders. They found that accuracy in diagnosing prostate cancer was 74%. The sensitivity was 50%, the specificity was 83%, and positive and negative predictive values were 53% and 82%, respectively. They concluded that "without knowledge of accurate clinical data, MR seems to be too insensitive in detecting prostate cancer to be used as a primary diagnostic tool".[30] Ogura et al.[31] also found that the overall accuracy of detecting cancer localization in the prostate gland with MRI was 72%. In addition, the detection of tumor localization was more accurate in the peripheral zone (80%) than in the transitional zone (63%).[30] They concluded that "this technique may be useful for the selection of patients for radical prostatectomy and, in particular, for identifying candidates for nerve-sparing surgery".[30]

In another study[32], MRI was revealed to have a sensi-

tivity of 75% and specificity of 82% in the differentiation of locally advanced carcinoma when compared to positive histological samples. When there was prostatic capsular invasion, Mikata et al.[33] found that the diagnostic accuracy by MRI was 63.3%, where as preoperative PSA was 89.7% when its cut-off value was 17ng/mL.

Conclusion

Chiropractors treat musculoskeletal complaints such as low back pain on a daily basis. In some instances, visceral problems can present as mechanical low back conditions. When a patient presents with characteristic features, a correct diagnosis is easily made. It is often the case that clinical practice does not provide classic textbook examples and the clinician must be vigilant by performing a careful history, examination and other indicated procedures to rule out life threatening conditions.

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