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Malignant Prostatic Tumor Revealing By Ivory Vertebra in a Context of Chronic Low Back Pain

Diaby Ladji Mohamed[1*], Sanogo Abass[2], Maiga Abdrahamane Salia[1], Camara Youssouf[2], Sow Salif[2], Diallo Lassina[2], Diawara Ousseynou[3], Kane Aboubacar Sidiki Thissé[2]
[1]Military Hospital of Kati-MHK, Koulikoro, Mali
[2]Military Hospital of Bamako-MHB, Bamako, Mali
[3]National Center of Odontostomatology of Bamako – University Hospital Center Bamako, Mali

***Corresponding author**
Diaby Ladji Mohamed

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Abstract: Low back pain is a painful condition of the lumbar spine. When it is acute, it is a lumbago (or "crick in the back" in everyday language). Lumbar pain may be the clinical expression of an infectious, inflammatory, tumoral and visceral disease or traumatic anatomical injury. It affects between 40 and 70% of people at one time or another. We report the case of a 60-year-old Malian who was referred for chronic relapsed low back pain with conventional treatment. In examination, we found pain localized in the lumbar region (mechanical or inflammatory) associated with mobility limitation, Schober: 10 + 1.5 cm; a notion of dysuria, an alteration of the state of general stage III of WHO, low back pain mixed with a visual analogue scale (VAS) evaluated at 9/10. Low back pain is a common symptom of consultation in rheumatology. The wide etiological diversity urges a diagnostic approach. The finding of Ivory vertebra is a rare; it is, usually due to metastatic and radiological findings. Its treatment is symptomatic, etiological and especially multidisciplinary.
Keywords: Malignant, Prostatic Tumor, Ivory Vertebra, Chronic, Pain, Military Hospital, Bamako- Mali.

INTRODUCTION

Low back pain is a painful condition of the lumbar spine. When it is acute, it is a lumbago (or "crick in the back" in everyday language). Lumbar pain may be the clinical expression of an infectious, inflammatory, tumoral and visceral disease or traumatic anatomical injury. It affects between 40 and 70% of people at one time or another [1].

In the United States, low back pain causes absenteeism with direct and indirect costs estimated at 40 to 50 billion of US Dollars [1]. In Quebec, back pain accounted for 30% of all compensated injuries; in 2003 alone, these injuries cost more than 500 million of Canadian dollars [1]. In some patients with low back pain, pain persists and worsens to the point that it considerably restricts their daily activities including work. Studies showed that the frequency and severity of back injuries are three times higher among construction workers than others economic activities.

Back pain is the main cause of inability to work among people under the age of 45 and the third in people at the age of 45 and above. it is a health issue which is more expensive than AIDS, cancer or heart disease. In fact, low back pain becomes a serious issue that the World Health Organization (WHO) made it "Bone and joint decade" years from 2000 to 2010.

The symptomatology is very varied:
• Pain in the lumbar region, often in the bar;
• occurred suddenly during an effort;
• possible irradiation to the buttocks, thighs, knees;
• Increased pain during movement and effort.
• Reduction of pain during care or rest;
• Accompanied by radiculalgia or sciatica;
• The duration of symptoms is variable, often a few days (acute low back pain), sometimes several years (chronic low back pain) [1].

Paraclinical exams are usually useless for the clinical diagnosis of acute low back pain. Most of the orientation is obtained by the clinical picture and especially by the interrogation.

However, in chronic low back pain, bone assessment (densitometry and especially vitamin D dosage) is useful. In all cases, a standard radiograph of the lumbar spine will be performed: profile of the lumbar vertebrae and large X-Ray of De Seze.

Theoretically, any lesion of movable intervertebral segment (or vertebral functional unit)

could lead to lumbalgia whether the origin is discal, posterior articular, ligamentous, muscular or bone (osteoporosis, osteomalacia). In fact, the involvement of the intervertebral disc appears to be the common denominator and the *primum movens* for most lumbar mechanical pathology; even though, it is favored by a structural anomaly (spondylolisthesis, lumbosacral transitional anomaly, Scheuermann's disease, scoliosis), postural (inequality of length of the lower limbs, low angle lumbo-pelvic incidence responsible for insufficient lumbar lordosis) or by overstressing (professional or sports) responsible for early degenerative lesions [1,2]. Propionibacterium Acnes is a bacterium of acne, could also be the cause of chronic low back pain [2-4].

However, one must always look for a primary or secondary tumor of low back pain and especially in face of making a discovery of ivory vertebra on X-ray. The ivory vertebra is defined by a condensation of the vertebral body without modification of its contours or its height or the adjacent disc.

The diagnosis of ivory vertebra is made on x-rays. The condensation is diffuse and homogeneous and involved the majority or the whole vertebral body. In 1925, It was first described by Souques. Ivory vertebra is rare; it is a real challenge for clinician and radiologist [5].

The discovery of ivory vertebra is frequent during certain pathologies: metastases, Paget's disease, tuberculous spondylitis, lymphoma, primary myelofibrosis (myeloid splenomegaly), fluorosis. It is rarely observed under certain circumstances: multiple myeloma, osteopetrosis, SAPHO and aseptic osteitis, osteosarcoma, Ewing's sarcoma, chondroma, mastocytosis, sarcoidosis [6].

Metastases are the most common etiology: the most common primary cancers of the prostate, breast, bladder, lung and carcinoids. In children, neuroblastoma and medulloblastoma are the most common primitives. Prostate cancer is developed from prostate cells that line the small glands in the prostate. Normally, the cells grow and divide according to a pre-established order by information contained in the cell's nucleus [7].

When this process of growth is no longer following “instructions" of cell program, division becomes anarchic and unrestrained; and it leads to a tumor. This tumor can be either "benign" and without great danger to health or "malignant"; and it is then considered as a cancer. The malignant tumor has the potential to destroy other cells and grow remotely in other parts of the body. This is called metastasis. It can also recur after treatment.

The cause of prostate cancer is unknown. However, it is known that male hormones (essentially testosterone) are necessary for the development of prostate cells. They then play a role in prostate cancer [7]. Chance of recovery is even greater when the diagnosis of prostate cancer is made early.

The best method for detecting prostate cancer at an early stage is to combine a prostate specific antigen (PSA) dosage in the blood with a rectal examination of the prostate. If digital rectal examination is normal and the PSA value is below normal, the probability of prostate cancer is very low. Further tests should be started if the digital rectal examination is positive and the PSA value is greater than or equal to 4 ng / ml.

The diagnosis of prostate cancer is based on results of biopsy with histopathological examination. When the diagnosis of prostate cancer is confirmed by results of tissue biopsy, further investigations (the extension and / or pre-therapeutic assessment) of medical imaging such as CT scan, X-rays and bone scintigraphy are performed to detect possible bone metastases.

The preferred metastatic sites for prostate cancer are lymph nodes, lungs and bones. It is the first osteophilic cancer in human. The objective of this work is to determine an ivory vertebra occurred secondary to a prostatic malignancy.

OBSERVATIONS

We report the case of a 60-year-old Malian who was referred for chronic relapsed low back pain with conventional treatment.

In examination, we found pain localized in the lumbar region (mechanical or inflammatory) associated with mobility limitation, Schober: 10 + 1.5 cm; a notion of dysuria, an alteration of the state of general stage III of WHO, low back pain mixed with a visual analogue scale (VAS) evaluated at 9/10. The prostate appeared hard as a rock, swollen and painful to the digital rectal examination.

In paraclinical examination

- In biology exam, we found VS: 69 mm in the first hour; CRP: 89mg; hypochromic anemia of inflammatory type at hemogram; Hb values: 10mg, MCHC: 25, hypercalcemia at 191mg / l ASLO: 800IU / ml; rheumatoid factor: 24 IU / l; PSA: 197 ng / ml.
- In medical imaging, in lumbar radiography of face profile, we noted: rectitude of the lumbar spine, osteocondensation of the vertebra L2 (aspect of ivory vertebra) and the left of the vertebra L1 in favor of metastases.

In face these results, the diagnosis of malignant prostate tumor with lumbar vertebral metastases was mentioned. In front of malignant hypercalcemia (ionogram, electrical activities of heart) and low back pain (EVA: 9/10), a bisphosphonate infusion was performed 10 mg of zolendronate (Zolendro-Denk) in 200cc of saline, 1g of paracetamol for injection and oral tramadol at a dose of 300 mg per day. At the end of the infusion the EVA was estimated at 4/10.

Urological consultation was requested followed by radical prostatectomy. The operative specimen was sent for anatomo-pathological study. The result of adenocarcinoma was provided by the biopsy. The patient was referred to oncology department for chemotherapy and radiotherapy.

After three months, the patient was autonomous, with a clear regression of low back pain, inflammatory syndrome, PSA, and normalization of plasma calcium level.

Fig-1: Lumbar rachis X-Ray showing osteodondensation of the vertebra

DISCUSSION

Few studies were devoted to the discovery of ivory vertebra secondary to prostate cancer. Bone metastases are an invasion of the bone by the hematogenous dissemination. In women, the most osteophilic cancer is breast cancer. In contrast, men prostate cancer is alone responsible for 80% of bone metastases [8]. In prostate cancer, 70% of metastases are bone and occur mainly in the axial skeleton (spine, pelvis and skull). They are typically osteoconductive ("ivory vertebrae"), but they can also be mixed, less than 5% of osteolytic cases.

At an early stage, bone lesions are often asymptomatic; their investigation must be systematic during the diagnosis, since the strategy may be completely changed. Depending on their localization, these lesions can also be responsible of pain and engage functional prognosis or significantly alter the quality of life by the occurrence of fractures, compressions of spinal column or even general metabolic and hydro-electrolytic disorders as the hypercalcemia in the most disseminated cases.

In 2004, the University of Rochester in New York (USA) conducted a study to identify a subset of patients who would be more likely to develop oligometastasis. For initially localized prostate cancer, retrospective data from 369 patients cured by radiotherapy revealed that 74 patients (20%) developed metastases. In 10 years' follow-up, a significant difference in overall survival was observed in subjects who only developed bone metastases (58% at 5 years and 27% at 10 years). Patients with spinal bone metastases had better survival than patients with pelvic lesions. Patients with less than 5 metastases respectively had better overall survival than those with more than 5 metastases (73 and 36% versus 45 and 18% at 5 and 10 years,). Survival without bone metastases was also significantly longer than for patients with less than 5 metastatic sites [9]. Thus, a patient with bone oligometastatic prostate cancer is a candidate for more intensive and aggressive treatment.

Anyway, today, distinguishing these different diseases or stages only depend on diagnostic means available. The diagnosis is fundamentally linked to medical imaging used to detect metastatic extension. Today, scientific and technical advancement in imaging make possible to diagnose earlier oligomastatic bone disease. For example, even when coupled with computed tomography, bone scintigraphy in prostate cancer was not able to detect paucimetastatic disease (5 sites), but it is only possible at the median PSA level of 25 ng / ml.

Specify the type of study A series of 414 bone scans performed in 230 men with biochemical

recurrence after radical prostatectomy [10] showed a positive test rate of 4% for PSA levels below 10 ng / ml. Today, with the advancement of magnetic resonance imaging (MRI), and Positron Emission Tomography (PET) imaging, an oligometastatic disease is detectable for PSA level lower than 7 ng / ml. A recent study compared 73 patients with biochemical relapse after treatment of localized prostate cancer with 2 tracers for PET-scan: 2-deoxy-2- (^{18}F) fluoro-D-glucose (FDG) and 11C-choline. The sensitivity of PET was 60.6% with 11C-choline and 31% with FDG. For PSA level greater than 1.9 ng / ml, it was 80 and 40%, respectively [11]. New tracers are still being evaluated, such as 68Ga-PSMA (68Ga-labeled Prostate-Specific Membrane Antigen). A retrospective trial [12] compared in 37 patients with biochemical recurrence, 68Ga-PSMA and 18F-methylcholine PET. It seems that the first is more sensitive: 78 lesions were detected in 32 patients, against only 56 lesions in 26 of these same patients with the second ($p = 0.04$). In addition, all the lesions detected by 11C-choline PET were seen by 68Ga-PSMA PET, and the 68Ga-PSMA PET SUVmax was more intense (> 10%) in 62 lesions out of 78 studied. as with FDG PET [10]. looking forward for comparative trials, 11C-choline PET is the first-line examination in biochemical recurrence after local treatment of prostate cancer. Its good sensitivity (85%) and its specificity (88%) give it a prominent place in the diagnosis of toligometastatic disease of prostate cancer and even at low PSA levels.

Therapy is specific but requires multidisciplinary collaboration. There are symptomatic, adjuvants and disease modifying treatments. For more than 40 years, standard therapy for metastatic prostate cancer has remained unchanged: a chemical castration combining analogs of LH-RH and anti-androgens during the first month and then, continuous analogues in paucisymptomatic patients. Next, a second-generation chemotherapy or hormone therapy (abiraterone acetate, enzalutamide) during the inevitable occurrence of castration resistance.

This occurrence of hormonoresistance occurs within the androgen receptor and is currently well described: it is done by successive mutations under the pressure (or not) of the general hormonosuppressive treatment [11]. The reduction of androgen synthesis by local means (before the androgen receptor "learns" to do without androgens) could increase the duration of the hormonosensitivity. This implies a limited number of sites and therefore, again, an oligometastatic context. This approach would be in the field of external targeting radiotherapy; which is a high dose of hypo fractionated stereotactic radiotherapy (SBRT). Currently; the choice between these two possibilities (chemotherapy and second-line hormone therapy) largely remains arbitrary. Although, better knowledge of successive mutations of the androgen receptor has led to the discovery of a splice variant (the AR-V7); it could lead to establishing real strategy in the future [12]. Other therapeutic approaches are opening up for these patients, such as radium-223, short range alpha rays with specific antitumor effect for the treatment of bone metastases.

In lack of scientific data, its place in the therapeutic sequence remains to be specified (Haute Autorité de Santé [HAS]). The negative impact of these treatments on the quality of life and their poor tolerance (impotence, loss of libido, hot flushes, increased risk of cardiovascular events for the analogues in particular) pushes us however to seek alternatives therapies in patients with metastatic disease only in the bone of slow evolution and whose life expectancy is good [13]. Today, in asymptomatic oligometastatic subject, medical supervision and surveillance are considered as a therapeutic option, but this attitude may contribute to emphasize patient and clinician stress. Especially, in case when clinicians confronted to patients who are in good overall condition, aware of their illness and care-seekers; all of these facts project us into the spiral of systemic treatments. Today, the benefit of local treatment emerges in an intermediate situation, especially in patients with relapsed oligometastatic osseous, asymptomatic or little symptomatic.

CONCLUSION

Low back pain is a common symptom of consultation in rheumatology. The wide etiological diversity urges a diagnostic approach.

The finding of Ivory vertebra is a rare; it is, usually due to metastatic and radiological findings. Low back pain can cause functional prognosis because of pain and stiffness, but also vital depending on the etiology. Its treatment is symptomatic, etiological and especially multidisciplinary.

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