



## Research Article

# Diagnostic, Therapeutic and Prognostic Features of Spinal Metastases from Prostate Adenocarcinoma at the Yaoundé General Hospital

*Aspects Diagnostiques, Thérapeutiques et Pronostiques des Métastases Vertébrales de l'Adénocarcinome de la Prostate à l'Hôpital Général de Yaoundé*

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**ABSTRACT**

**Objective.** Spinal metastases of prostate adenocarcinoma (ADK) are mostly diagnosed at the late stage, resulting in the development of spinal cord compression responsible for a deterioration in quality of life. This work aimed to study the diagnostic aspects, therapeutic modalities and prognostic factors of this pathology at the Yaoundé General Hospital. **Methods.** This was a descriptive study about patients followed up for spinal metastasis of histologically proven prostate adenocarcinoma from January 1, 2015 to April 30, 2023 at the Yaoundé General Hospital. **Results.** Were included, 65 patients with a mean age of  $65.5 \pm 7$  years, and in whom the primary cancer was known in 67.6% of cases. 83.1% of consultations were late and spinal pain was the most common symptom (64.6%). The radiological lesions were mainly osteocondensing (43.8%) and extradural (86.6%) affecting the spine at multiple location (53.8%) but with a lumbar predilection (35.3%) in single locations. 72.3% of patients had a Prostate Specific Antigen (PSA) level above 100ng/ml. Only 18.4% of patients had a laminectomy. 59.9% had a survival of less than one year, in correlation with predicted survival according to the Tokuhashi score. **Conclusion.** Spinal metastasis of prostate adenocarcinoma mainly affects elderly people. The diagnostic delay was regrettable, despite knowledge of the primary tumor in most patients. Multidisciplinary management remains the best therapeutic approach, the prognostic is bad.

**RÉSUMÉ**

**Objectif.** Les métastases rachidiennes de l'adénocarcinome de la prostate sont pour la plupart diagnostiquées à un stade tardif, entraînant le développement d'une compression médullaire responsable d'une détérioration de la qualité de vie. Ce travail visait à étudier les aspects diagnostiques, les modalités thérapeutiques et les facteurs pronostiques de cette pathologie à l'Hôpital Général de Yaoundé. **Méthodes.** Il s'agit d'une étude descriptive portant sur des patients suivis pour métastases rachidiennes d'un adénocarcinome de la prostate histologiquement prouvé du 1er janvier 2015 au 30 avril 2023 à l'Hôpital Général de Yaoundé. **Résultats.** ont été inclus 65 patients, âgés en moyenne de  $65,5 \pm 7$  ans, et chez lesquels le cancer primitif était connu dans 67,6 % des cas. 83,1 % des consultations étaient tardives et les douleurs vertébrales étaient le symptôme le plus fréquent (64,6 %). Les lésions radiologiques étaient majoritairement ostéocondensantes (43,8 %) et extradurales (86,6 %) touchant le rachis en plusieurs localisations (53,8 %) mais avec une prédilection lombaire (35,3 %) en localisations uniques. 72,3 % des patients avaient un taux d'antigène spécifique de la prostate (PSA) supérieur à 100 ng/ml. Seulement 18,4 % des patients ont eu une laminectomie. 59,9 % avaient une survie inférieure à un an, en corrélation avec la survie prédite selon le score de Tokuhashi. **Conclusion.** Les métastases rachidiennes de l'adénocarcinome de la prostate touchent majoritairement les personnes âgées. Le retard diagnostique était regrettable, malgré la connaissance de la tumeur primitive chez la plupart des patients. La prise en charge multidisciplinaire reste la meilleure approche thérapeutique, le pronostic est mauvais.

**INTRODUCTION**

Prostate cancer is the most frequent neoplasia in men and manifests exceptionally before the age of 50 [1]. Histologically, it is more present in the form of adenocarcinoma in nearly 95% of cases [2]. While it is

discovered early in developed countries, prostate cancer is still diagnosed at a metastatic stage in our setting, despite its high prevalence [3, 4]. It is Classified as the first primary cancer to metastasize to the spine, and one of the consequences of its location in this region is the

development of spinal cord compression responsible for a deterioration in quality of life [5–7].

Though spinal metastasis is suspected clinically when these patients present with low back pain, the diagnosis is confirmed based on imaging and pathology finding. Management is multidisciplinary but the prognosis is generally poor [8]. In light of this, we set out to describe the diagnostic, therapeutic and prognostic aspects of spinal metastases of prostate adenocarcinoma in the Yaoundé General Hospital.

## METHODS

This was a descriptive cross-sectional study involving 65 patients followed up for spinal metastasis of histologically proven prostate adenocarcinoma from January 1, 2015 to April 30, 2023 at the Yaoundé General Hospital. The Yaoundé General Hospital is the regional cancer care center. It includes: a radiotherapist; three physiotherapists; three urologists; two medical oncologists and three neurosurgeons.

The data were collected and analyzed using the Statistical Package for Social Sciences (SPSS) version 25.0 software. The parameters studied were: socio-demographic characteristic (age); time between onset of symptoms and medical consultation; mode of revelation (clinical/incidental signs); clinical picture and severity of the attack; different classifications (WHO, Frankel); types of imaging performed and neurological signs; PSA level; management modalities; prognostic factors: vital prognosis (revised Tokuhashi score).

## RESULTS

### Demographics Data and clinical characteristics

The average age was  $65.5 \pm 7$  years and the age range from 53 to 83. The most affected age group was between 61 and 70 years (53.8%).

All patients were diagnosed based on presenting signs, dominated by spinal pain (64.6%), progressing for an average period of three months, 51-150 days for the majority (43%). In 67.6% of cases, the diagnosis of adenocarcinoma of the prostate was known.

41% of the population presented deterioration in general condition with WHO performance status stage 3, followed by stage 4 (21.5%).

Neurological syndromes were dominated by the spinal syndrome, found in 72.3% of patients and the lumbar spine was the most affected level (60.2%) [Table I].

**Table I: Distribution according to lesion level**

Lesion level	n	%
Lumbar	39	60
Thoracic	19	29.2
Sacred	05	07.6
Cervical	02	03

61.5% of patients had incomplete spinal cord compression. Also, it is worth noting that a patient could present several syndromes including an anemic syndrome (43%) and the obstructive disorders of the lower urinary tract (33%).

### Paraclinical characteristics

CT scan was the most performed morphological examination (59.3%) ahead of MRI (20.2%) and conventional X-ray (18.8%) [Table II]. The lesions observed were more osteocondensations (59.52%) and extradural lesion (86.6%).

**Table II: imaging workup**

Lesion level	n	%	
CT	Spine	32	46.3
	TAP	9	13
MRI		14	20.2
Conventional X-ray		13	18.8
Scintigraphy		1	1.4

CT: Computerized tomography . TAP: Thoraco-abdomino-pelvic  
MRI: Magnetic resonance imaging

53.8% of patients had multiple locations, of which half had at least one thoracic location. On the other hand, of the 30 patients with single locations, 23 were in the lumbar region [Table III].

**Table III: Location of lesions according to the segment affected**

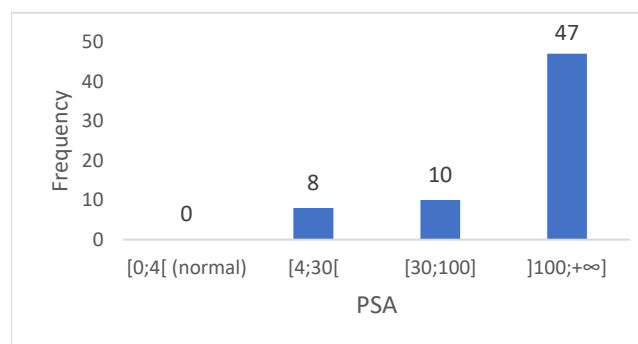
Location	n	%	
Multiple	35	53.8	
Single	Lumbar	23	35.3
	Thoracic	06	09.2
	sacred	01	01.5

The extension workups consisted in a chest X-ray, a thoraco-abdominopelvic CT scan and an abdomino-pelvic ultrasound. The other metastases found were mainly extra spinal bone metastases (27.7%) [Table IV].

**Table IV: other sites of extraspinal metastases**

Sites of extraspinal metastases	n	%
None	37	56.9
Bone	18	27.7
Lung	4	6.2
Pleura	4	6.2
Lymph node	3	4.6
Brain	2	3.1
Peritoneum	1	1.5
Liver	1	1.5

The prostate specific antigen assay reported in 72.5%, returned high with a peak above 100 ng/ml (Figure 1).



**Figure 1:** Breakdown by total PSA level

**Management**

Care was started immediately after medical consultation in 95.38% of cases. Analgesics were used in 86.1% of patients for pain management. It was often a Level II analgesic (75.3%) such as Tramadol or the paracetamol – opioid combination or a Level III analgesic such as morphine derivatives in 9.2% of cases. Corticosteroids were used in 52.3% of patients. The most used molecule was methylprednisolone (85.2%) at a dose of 120 mg/day while zoledronic acid was used at a dosage of 4 mg every 28 days in 15.4% of patients, against pain and bone resorption.

Radiotherapy was used in 30% of patients.

Hormone therapy in our series consisted of castration, which was done either only medically (46.6%); surgically (29.7%), or medico-surgically (23.3%) [Table V]. It should be noted that only antiandrogens were associated with surgical castration.

**Table V: Distribution according to type of castration**

Castration type		n	%
<b>Medical only</b>	Antiandrogens	16	34
	LH-RH agonists	03	06.3
	Antiandrogens + LH-RH Agonists	03	06.3
	<b>Surgical only</b>		
Bilateral orchidectomy	09	19.1	
Pulpectomy	05	10.6	
<b>Medical-surgical</b>	Medical + bilateral orchidectomy	06	12.7
	Medical+ pulpectomy	05	10.6

Chemotherapy was used in 10.8% of patients, of whom: 4.6% received monochemotherapy with Docetaxel; 2.3% polychemotherapy with Docetaxel and the Abiraterone-Carboplastin-Carbazitaxel-Docetaxel protocol.

Surgically, radical prostatectomy was performed in 4.6% of patients. Spine surgery was proposed in 12 patients (18.4%) and was performed in 7 patients (10.7%). The other interventions were not carried out for financial reasons.

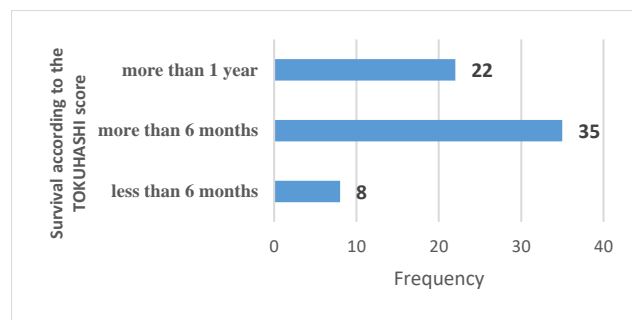
The indications for surgery were as follows: partial compression (laminectomy + biopsy); complete compression (laminectomy + biopsy at the surgical site when the histology was unknown, while surgery was avoided when the histology was known, in favor of hormone therapy). The posterior approach was used to operate all patients.

**Prognosis**

Life expectancy at more than one year was predicted at 33.8% according to the Tokuhashi score (Figure 2) and found at 39.9% in this study [Table VI].

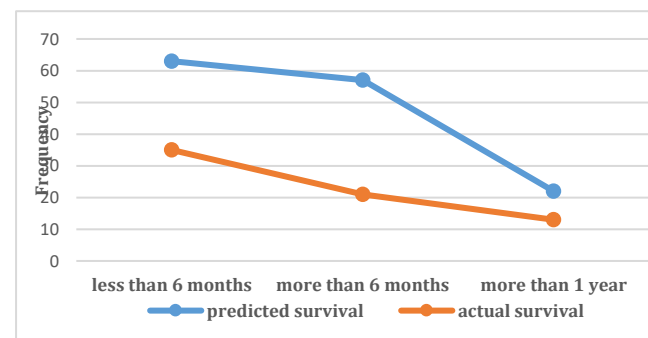
**Table VI: Distribution of patients according to their actual survival**

Situation		n	%
Deceased	Less than 6 months	13	37.1
	More than 6 months	8	12.8
	More than 1 year	5	14.2
Living		9	25.7



**Figure 2:** Distribution according to Tokuhashi score

Comparatively, we found a concomitant decrease in survival from less than 6 months to more than a year in the real situation and as predicted by the Tokuhashi score (Figure 3).



**Figure 3:** Correlation between predicted survival and actual

**DISCUSSION**

**Demographic data and clinical characteristics**

The average age of patients in our study was 65.5 years with a range of 53 to 83 years. Our results overlap with those obtained by Niang, Cussenot, and Atenguena, which were respectively 65 years, 64 years and 66 years [9–11]. Prostate cancer is the most common cancer in men and mainly affects elderly people [12].

All patients in our series (100%) were diagnosed in the context of presenting signs with either spinal secondary localization or in relation to prostate ADK. These results are close to those obtained by Boussios et al who had 95% of patients symptomatic at the time of diagnosis [13]. The Tunisian series including that of Marie V. et al concerning the mode of revelation of bone metastases are not similar with this result [14]. Nwatssock et al in their study on the scintigraphic aspects and prognosis of bone metastases in Cameroon found that in 26.49% of typical cases, there was no clinical sign of bone tenderness [15].

43.1% of patients consulted between 51 and 150 days and the average time was 3 months. These results are significantly lower than those obtained by Cisse et al in which the majority of patients (48%) had consulted between 8-17 months. This observation is much more explosive for Fofana et al who had 85.6% of patients who consulted between 2 and 3 years [16, 17]. These differences could be explained by the fact that in our series, most of the patients (67.7%) had knowledge of the primary cancer and could therefore recognize signs related to metastasis earlier.

Spinal pain was indicative of metastatic disease in 64.6% of cases, followed by motor deficit found in 50.8% of patients. This result is similar to that of other African and Western series [8, 18, 19]. All this confirms that spinal pain and motor deficit are the main presenting symptoms of spinal metastatic disease worldwide.

67.6% of patients already had a diagnosis of ADK of the prostate at the time of discovery of spinal metastases. Metastasis in our series therefore revealed the existence of a prostate ADK in 32.3% of cases. This result is in agreement with Boussios et al. in which 80% of patients knew their diagnosis of primary tumor, as well as Kwok et al. in whom the vast majority of patients also knew their primary tumor [13, 20]. This demonstrates the similitude between prostate ADK and other osteophilic cancers.

WHO performance status stage III was dominant in our series, at 41% followed by stage IV at 21.5%. These results differ from those obtained by Bakop et al in 2022: WHO performance status score mainly at II (28.7%) and III (25.7%) respectively [7]. This can be explained by the younger population in their series with an average age of 56 years against 65 years in our case.

The clinical picture was dominated by spine syndrome present in 72.3% of patients and sublesional syndrome present in 63% of patients. These data are similar to those presented by Kwok and collaborator in the USA and Al-Qurainy and collaborator in China as well as Elaji et al in Morocco. Jibia et al in Ivory Coast in 2015 had sublesional syndrome as the main element of the clinical picture. These results highlight the fact that spine syndrome and signs of spinal cord compression are the main elements of the clinical picture.

In our series, the level of compression mainly concerned the lumbar region, in 23 out of 38 patients with a lesional syndrome (60.5%), followed by the thoracic (28.9%) and cervical (7.8%) regions. Similar results have also been reported by many authors [21, 22]. However, other studies have rather shown the thoracic location to be the most frequent [23–25].

In 27.7% of patients, the main associated sign was the anemic syndrome. This could be explained by hematuria or the progression of the tumor.

#### **Paraclinical characteristics**

Ndao et al in a retrospective study about 17 observations of slow spinal cord compression in internal medicine showed that radiography of the spine associated with CT of the spine could be effective in the etiological search for spinal cord compression [26]. In our series, computed tomography was the most common imaging performed by patients (59.3%) ahead of MRI (20.2%) and spine X-ray (18.8%). It was mostly spinal (46.3%) but could be thoraco-abdomino-pelvic (13%) and often associated with spinal radiography or MRI.

These differences could be explained by the social and economic setting. Indeed, in our setting, access to MRI remains limited due to its still high cost for most patients and its non-popularization in health facilities. Scintigraphy remains very little used in our setting (1.5%).

The density anomaly was mainly marked by osteocondensation lesions (43.8%), followed by osteolysis

lesions (15.7%) and mixed lesions (14%). Bakop et al. found osteolysis predominating over osteocondensation lesions in respectively 49 and 32 patients [7]. These differences demonstrate the ability of ADK to cause more osteocondensations than osteolysis as described in the literature [27, 28].

Djientcheu et al in a retrospective series on the etiologies of tumoral and pseudotumoral spinal cord compression showed that vertebral metastases accounted for 90% of extradural causes [6]. Beah in his study showed that vertebral metastases predominated at the extradural level by 96%. The results confirm this trend with 86.6% of patients presenting with extradural lesions. These results are consistent with the extradural nature of secondary spinal tumors as described in the literature [26].

The lesions observed mainly occurred at multiple locations (53.8%), and were mainly lumbar (35.3%) for single locations. These results reflect a good radio-clinical concordance.

The extension assessment was made by a chest X-ray, an abdominal and pelvic ultrasound and a thoraco-abdomino-pelvic CT scan. The other predominant metastases were extra vertebral bone metastases in 18 patients (27.7%). This data is indicative with the very osteophilic nature of prostate ADK. These metastases are prognostic factors because they are included in the Tokuhashi score.

The PSA level was above 100 ng/ml in 72.3% of patients. Tengue reported that the PSA level was greater than 100 ng/ml in 90.51% (n=210/232) of patients [29]. Our rate is much higher than that of Zongo in France and Burkina Faso with a PSA rate of 9.25ng/ml [30]. This could be explained by the fact that prostate cancer is generally discovered at an early stage in France [31].

#### **Management**

All patients started treatment immediately after diagnosis. In our series, 02 patients (1.9%) experienced a delay in treatment ranging from one to two weeks. This was due to financial reasons.

Concerning pain management, mainly the nociceptive component of pain was taken into account

WHO Step I (55.4%) and Step II (75.4%) were the most used regimens. These results are similar to those presented by Yomi et al. in their study on the clinical presentation and treatment of cancer pain at the YGH [32]. 13.8% of patients in our series did not receive analgesic treatment. This is justified by the fact that they had no spine or pain syndrome. 52.3% of patients benefited from corticosteroid therapy, with 44.6% at high doses. This corticosteroid therapy was short-term in the majority of cases with the possibility of being renewed, especially in combinations with chemotherapy (7.6%). However, the goals remain decompression, analgesia and reduction of the risk of pathological fracture in our series as in others.

The use of biphosphonates for antiresorptive purposes in our series is consistent with that described by Polascik [33]. The use of radiotherapy in only 30% of our patients clearly shows that it is still limited in our context, as highlighted by Djientcheu et al and Bakop et al in their series in relation to the results of meta-analyses [6, 7, 19, 34].

Hormone therapy was the adjuvant treatment in 47 patients (72.9%). It was most often strictly medical (46.6%) but sometimes medico-surgical (23.3%) in the event of failure of medical treatment. This was either medical treatment with a nonsteroidal antiandrogen (bicalutamide in 34%), sometimes alone or in combination. The other drug classes were used less. This result does not converge with that the study by Lebret et al in which LH-RH agonists are the most used [35]. Castration surgery alone was a poorly requested option (29.7%) in our study series compared to other means of castration.

Chemotherapy was only used in 7 patients (10.8%), which it was indicated in patients resistant to castration. It could be alone or in combination with other therapies. Three patients (4.6%) had monotherapy and 4 (2.3%), polychemotherapy. These data are similar to those in literature [19].

Spinal surgery was performed less in our context (18.4%) compared to 63% in a series by Jibia et al [36]. Laminectomy was performed in all these patients. It was performed alone, associated with biopsy or spinal fusion in respectively 4.6%, 4.6% and 1.5% of cases. These results converge with the African series and Western meta-analyses showing that laminectomy was the most used technique [6, 19, 36, 37]. Its aim was to reduce pain, decompress and stabilize the spine and make a histological diagnosis, as in the series by Djientcheu et al.

Only the posterior approach was performed. The low frequency of surgery could be explained by the low economic context in our setting. Vertebroplasty and percutaneous biopsy are not yet performed in our context.

### Prognosis

The majority of patients (59.9%) died before 1 year. This result explains the bad prognostic in the spinal metastasis of prostate adenocarcinoma.

### CONCLUSION

Spinal metastases from prostate adenocarcinoma affect the elderly. Patients were consulted late despite knowledge of the primary tumor for most patients. The clinical presentation is dominated by spine syndrome, and CT scan was essential for the diagnosis because of the still limited access to MRI.

Medical treatment enabled better management of pain and complications, and antineoplastic treatment was mainly based on hormone therapy. Surgery was dominated by laminectomy and prostatectomy. The prognostic is bad because the majority of patients died before one year.

The authors declare no conflict of interest.

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