Scientific Research Publishing

Open Journal of Urology, 2025, 15(10), 483-491
https://www.scirp.org/journal/oju
ISSN Online: 2160-5629
ISSN Print: 2160-5440

Craniocerebral Metastasis of a Prostatic Adenocarcinoma Revealed by a Frontal Bump: A Case in Gabon

Mbadinga-Nzamba Ghislain[1], Yevi Dodji Magloire Inès[2], Olagui S. Giscard[3], Adandé Ménest Elvire[4], Avakoudjo Josué[5], Bénizri Eric Jacob[6]

[1]Department of Surgery, University Hospital Center of Owendo, Libreville, Gabon
[2]Urology-Andrology Unit, Ouémé Departmental University Hospital Center, Porto-Novo, Benin
[3]Department of Surgery, Omar Bongo Ondimba Army Training Hospital, Libreville, Gabon
[4]Department of Surgery, Libreville University Hospital Center, Libreville, Gabon
[5]University Clinic of Urology-Andrology, Hubert Koutoukou Maga National University Hospital Center, Cotonou, Benin
[6]Department of Urology, Imperial Park Clinic, Nice, France
Email: ghismbadinga@yahoo.fr, dryevi@gmail.com, golagui@icloud.com, amecz@yahoo.fr, avakoudjoj@gmail.com, eib06@wanadoo.fr

How to cite this paper: Ghislain, M.-N., Inès, Y.D.M., Giscard, O.S., Elvire, A.M., Josué, A. and Jacob, B.E. (2025) Craniocerebral Metastasis of a Prostatic Adenocarcinoma Revealed by a Frontal Bump: A Case in Gabon. *Open Journal of Urology*, **15**, 483-491.
https://doi.org/10.4236/oju.2025.1510050

Received: June 12, 2025
Accepted: October 28, 2025
Published: October 31, 2025

Abstract

Background: Prostate cancer is the most common urological cancer in men over fifty. Its most common metastatic sites are bone, lymph nodes, liver, and lungs. Cranial metastases are rare. The authors report a rare case of craniocerebral metastasis from prostatic adenocarcinoma revealed by a frontal bossing in Gabon. **Case Presentation:** A 63-year-old male electrician with no specific medical history was admitted for a painful frontal bossing that had appeared 8 months earlier. The physical examination was normal apart from the frontal mass, with no neurological signs. A digital rectal examination noted hypertrophy of the left prostatic lobe, and a PSA level of 1430 ng/ml was measured. A biopsy of the frontal mass revealed histologically a prostatic adenocarcinoma. A thoracoabdominopelvic CT scan and brain MRI showed lymph node, bone, and parietofrontal involvement, classifying the lesion as T4N1M1. **Procedure:** Complete androgen blockade was performed using a combination of bicalutamide and leuprorelin. **Outcomes:** The initial progression under treatment was a reduction of the frontal mass and a decrease in the ASPT level. However, the patient died nine months later. **Conclusion:** Any cranioencephalic mass in an elderly male should raise the possibility of secondary metastasis from prostate cancer until proven otherwise.

Keywords

Cancer, Prostate, Metastasis, Frontal Bone

1. Introduction

With approximately 1.4 million new cases and 375,000 deaths worldwide, prostate cancer was the second most common cancer and the fifth leading cause of cancer-related death in men in 2020. It was the most commonly diagnosed cancer in men in more than half (112 out of 185) of the world's countries. It was the leading cause of cancer death in men in 48 countries, including many in Sub-Saharan Africa [1].

The most common metastatic sites are bone and lymph nodes, followed by the liver and lungs [2].

Bone is a preferred site for the development of prostate cancer metastases. More than 70% of patients with castration-resistant cancer will develop bone metastases [3] [4]. Bone involvement is explained by a particular tropism of the prostate cancer lesion for the axial skeleton. It is characterized by significant morbidity due to the complications it causes [5]. Bone metastases generally occur in bone potentially weakened by bone loss related to age-related androgen deficiency (ADLD) [6], and bone loss in men from the age of 40 is estimated at approximately 0.3% to 0.5% per year. Cranial metastases are rare, and frontal localization is even rarer.

Brain imaging is not recommended in the staging assessment in the absence of neurological clinical signs because cerebral localizations are rare in the early stage of the disease [2].

We report the rare case of craniocerebral metastasis of prostate cancer revealed by frontal bossing in a Gabonese man, with a review of the literature.

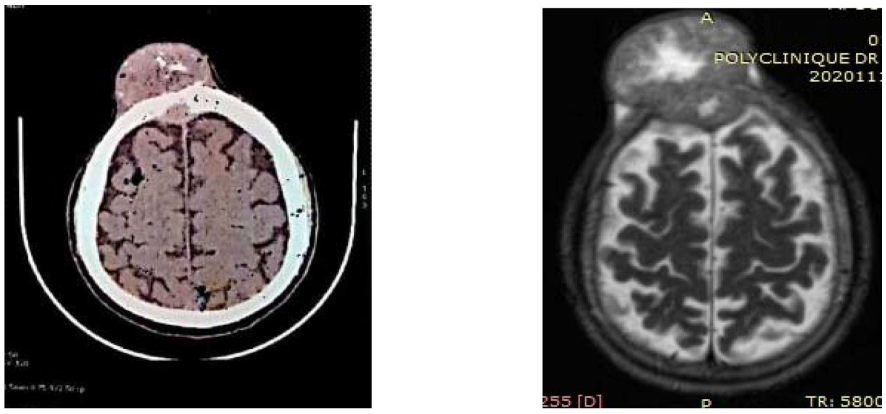
2. Case Presentation

Mr. E.B.I., a 63-year-old retired electrician with no particular medical history, was consulted by chance in October 2020 for a painful frontal swelling.

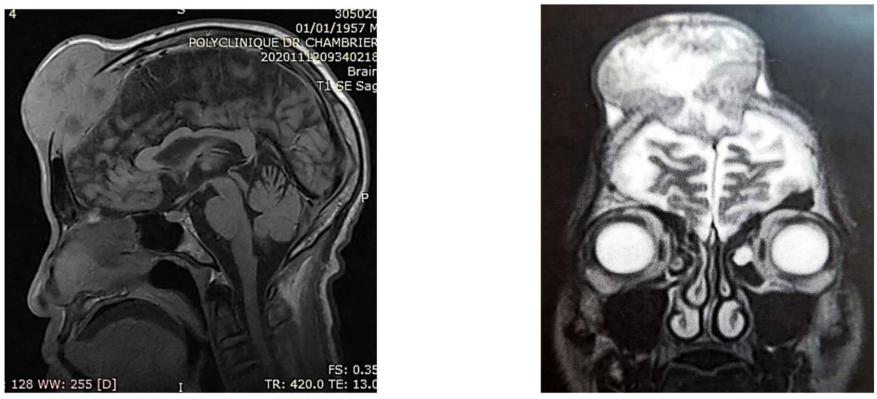
The swelling had appeared 8 months earlier, associated with arthralgia and a 19 kg weight loss, without any urinary disorders or neurological signs. On physical examination, the patient presented in good general condition and consciousness, with no neurological, sensory, or motor disorders. The swelling was firm, non-mobile, circumscribed, located on the frontal bone, extending onto both parietal bones, and offset to the right. It measured 54 × 47 mm and was 61 mm thick (**Figure 1**). On digital rectal examination, the prostate was enlarged and firm on the left. The PSA was 1430 ng/ml. The prostate biopsy concluded after anatomopathological examination that it was an adenocarcinoma with a Gleason score = 8 (4 + 4) (**Figure 2**). Computed tomography (CT) of the brain and thoracoabdominopelvic areas showed an enlarged prostate measuring 86.5 cc, with irregular contours suggesting capsular rupture with bladder invasion, and large lumbosacral, subiliac, and external iliac adenomegaly, some of which were necrotic. Multiple bone lacunae with clear, non-condensed edges of variable size were also found in the lumbosacral spine and iliac bones. Craniocerebral sections showed an extra-axial frontal mass with multiple calcifications, lysis of the skull, extracranial extension, and osteolytic nodules in the left parietal and right occipital condyles.

Profile view *Front view*

Figure 1. Front and side view of the frontal boss revealing the craniocerebral metastasis of a prostatic adenocarcinoma.



Cross sections of the cranial vault



Sagittal section Frontal section

Figure 2. Craniocerebral sections using magnetic resonance imaging.

Brain magnetic resonance imaging (MRI) revealed, at the expense of the frontal bone, a heterogeneous expansive process of 115 cc with a necrotic center measur-

ing 27 mm on its long axis, associated with a thickened meningeal connection. Lesion extension was identified in the superior longitudinal sinus and within the cerebral parenchyma in the right frontal location of 15 × 26 mm; nodular elements of the cranial vault, left hemi-frontal of 15 mm, occipital of 16 mm, and parietal of 21 mm. At the supratentorial level, there is noted a complete destruction of the cranial vault in the frontal region, associated with a frontal extra-axial mass of 62 × 58 × 62 mm, *i.e.*, an estimated volume of 115 cc.

A biopsy of the frontal mass was performed, confirming cranial metastasis of the prostatic adenocarcinoma (Figure 3 and Figure 4).

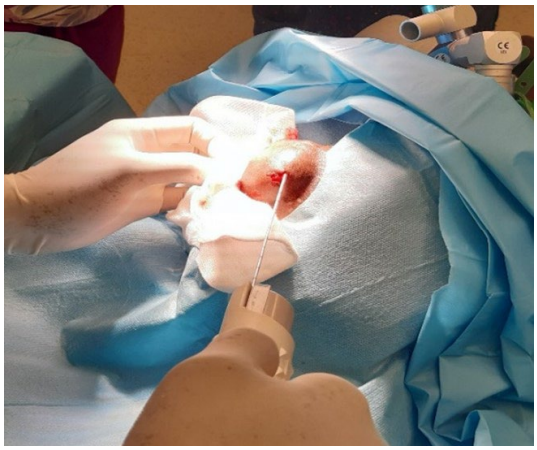


Figure 3. Biopsy puncture of the suspicious frontal mass.

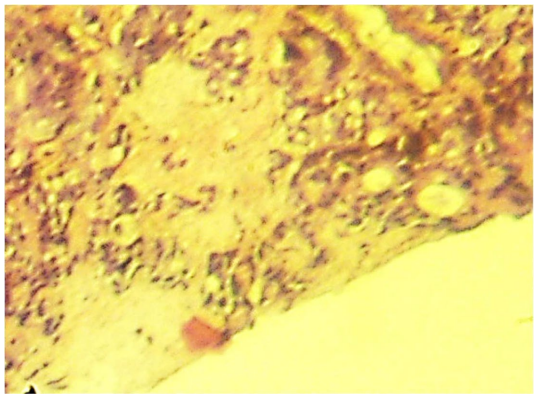


Figure 4. Histology of the frontal tumor mass.

Overall, metastatic prostatic adenocarcinoma with bone, lymph node, and cerebrocranial localizations is classified as T4N1M1.

2.1. Procedure

Complete androgen blockade was instituted, combining a nonsteroidal antiandrogen (bicalutamide 50 mg) and a biannual injection of an LH-RH agonist (leuprorelin 30 mg).

Zoledronic acid and vitamin D were combined with this treatment.

2.2. Outcomes

Under this treatment, the outcome was favorable, with a biological decrease in PSA levels from 1430 ng/ml to 825 ng/ml in the second month and to 524 ng/ml on the 15th day of the third month. Clinically, the patient showed a reduction in the volume of the frontal lobe mass, improvement in arthralgia, a return of appetite, and a weight gain of 3 kg over the same treatment period. However, the patient died 9 months later.

3. Discussion

Large autopsy series of metastatic prostate cancer (mPC) find cerebral involvement in 2% to 10% of cases. Among cerebral involvements, a distinction must be made between parenchymal metastases, dural (or pachymeningeal) metastases, and carcinomatous meningitis (or leptomeningeal involvement) [7]-[9].

In the literature, the first case of metastasis of prostatic adenocarcinoma to the frontal sinus was reported by Richmond J. B. in 1969 in the United States [10]. Several authors later reported isolated cases of metastases to the paranasal sinuses from prostate cancer [11]-[17]. However, it was actually the pathologist Max Perls who first described the presence of tumor metastasis in the paranasal sinuses in an 1872 autopsy report [10].

The paranasal sinuses are a complex anatomical area, surrounding important structures such as the orbit and skull base. Most primary tumors are, in order of frequency, squamous cell carcinomas, adenocarcinomas, and adenoid cystic carcinomas [16]. In a review, Prescher and Brors reported 169 cases of metastatic tumors of the paranasal sinuses, most of which originated from the kidney, lung, breast, thyroid, and prostate [17]. The most commonly affected sinuses are, in order of frequency, the maxillary sinus, the sphenoid sinus, the ethmoidal sinuses, and the frontal sinuses [17] [18].

The symptoms of paranasal sinus involvement, often nonspecific, are similar to those of primary tumors. Nasal signs include nasal mass, nasal obstruction, facial deformity, and/or epistaxis. Orbital signs may also be encountered, such as exophthalmos, ocular ptosis, decreased visual acuity, and diplopia [8] [9]. In our case, none of these symptoms were reported. The patient presented only with frontal bossing and arthralgia for a period of two months prior to admission. The reason why no nasal or orbital signs were observed in the patient is likely related to the strict localization of the lesion in the frontal sinuses without extension to the orbits or ethmoid sinuses.

The most common sites involved in prostate metastases are the bones (90%), lungs (46%), and liver (25%) [10]. The head and neck are rare sites for metastases, and they occur more frequently in the brain, dura mater, and lymph nodes [11]. However, several cases of brain metastases from prostate cancer have been reported in the literature [1] [19]-[23]. Our patient, although asymptomatic, presented with brain lesions on CT scans that were confirmed by MRI.

Unlike bone metastases, which remain the only metastatic site for a long time,

brain metastases from prostate cancer occur after several other organs have been affected. In autopsy series, no cases of isolated brain involvement have been found [8] [9]. This also explains why prostate cancer staging does not systematically include brain exploration.

Clinically, the diagnosis of brain metastases is based on neurological signs, with isolated headaches in more than a third of cases. Confusion, ataxia, impaired alertness, and, finally, localization signs are then found [19] [21] [22] [24]. In 0.25% of cases, hemorrhage from a brain metastasis is found on imaging, explaining the possibility of very noisy clinical pictures at the time of diagnosis [20] [22]-[27].

In cases of brain metastasis, the histological type found is small cell prostate carcinoma in 10% to 26% of cases, whereas this histological type affects only 1 to 2% of prostate cancer cases [19]-[21]. The histology of the frontal tumor sampled in our case concluded that it was a prostate adenocarcinoma, which is not consistent with data in the literature. Regarding the pathophysiology of these craniocerebral metastases, dissemination can undoubtedly occur in two ways:

- The hematogenous route. Cerebral involvement is present in the vast majority of cases at an advanced stage of the disease, when several organs are already sites of metastatic lesions, attesting to dissemination in the general circulation [8] [9].
- Invasion of the dura mater by continuity of bone lesions of the cranial vault, which can then also reach the subdural space and all the meninges, sometimes invading the parenchyma. Microscopic parenchymal lesions of the peripheral cortex opposite dural involvement are described in autopsy series [7].

The exceptional nature of isolated cerebral involvement and its consequences for management justify the use of a biopsy for diagnostic purposes in the event of the slightest uncertainty regarding causality, despite the risk represented by the neurosurgical procedure [2].

Treatment

The National Comprehensive Cancer Network's guidelines for the management of brain metastases, regardless of the primary disease, prioritize focal therapies. For patients with an estimated life expectancy of more than 3 months with controlled extracerebral disease, an invasive approach should be adopted. For patients with 1 to 3 lesions, surgery followed by whole-brain irradiation or radiosurgery is used. For patients with more than 3 lesions, radiotherapy techniques are recommended. In the absence of specific guidelines for prostatic neoplasia, it therefore seems justified to propose these strategies.

In the majority of cases, radical surgery cannot be considered for four reasons:

- The lack of control of the extracerebral disease.
- Anesthetic contraindications in patients who are often elderly and whose general condition is impaired.
- The technical impossibility of resecting certain parenchymal lesions.
- The type of lesion, particularly carcinomatous meningitis, for which surgery will be ineffective.

Surgery and radiosurgery are often preferred over TIE when the number of lesions is less than three, due to better tolerance in this elderly population. The regimens of 20 Gy in 5 fractions and 30 Gy in 10 fractions have not shown any difference. Preclinical data show that cabazitaxel crosses the blood-brain barrier better than docetaxel. Cabazitaxel can be considered in these patients, but its benefit needs to be confirmed by further studies [2].

In the case of our patient, given the limitations of the technical platform and the fact that the patient is still hormone-naïve, a complete androgen blockade based on a nonsteroidal antiandrogen (bicalutamide 50 mg) and a biannual injection of an LH-RH agonist (leuprorelin 30 mg), treatment under which the evolution is favorable after an initial three-month check-up, with, in particular, a regression of the frontal mass, a slight weight gain, and a regression of the arthralgias.

4. Conclusion

Prostate cancer metastases in the frontal sinuses and brain are rare, especially when they present as an isolated frontal hump without any neurological or urinary signs. Their management requires a methodical diagnosis through histological confirmation of the secondary lesion. Management is multidisciplinary, based on rigorous and well-informed imaging. Treatments are those for metastatic prostate cancer.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Hyuna, S., Jacques, F., Rebecca, L.S., Mathieu, L., Isabelle, S., Ahmedin, J., *et al.* (2021) Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality World-Wide for 36 Cancers in 185 Countries. *CA*: *A Cancer Journal for Clinicians*, **71**, 209-249.

[2] Loir, E., Pignot, G., Salem, N., Fuentes, S. and Gravis, G.S. (2017) Métastases cérébrales dans le cancer de la prostate: Revue de la littérature. *Correspondances en Onco-Urologie*, **2**, 66-70.

[3] Lebret, T., Méjean, A. and Houédé, N. (2011) Physiopathologie et nouvelles stratégies thérapeutiques dans la prise en charge des métastases osseuses du cancer de la prostate. *Progrès en Urologie*, **21**, 301-307. https://doi.org/10.1016/j.purol.2010.12.001

[4] Coleman, R.E. (1997) Skeletal Complications of Malignancy. *Cancer*, **80**, 1588-1594. https://doi.org/10.1002/(sici)1097-0142(19971015)80:8+<1588::aid-cncr9>3.0.co;2-g

[5] Lebret, T. and Méjean, A. (2008) Physiopathologie, diagnostic et prise en charge des métastases osseuses du cancer de prostate. *Progrès en Urologie*, **18**, S349-S356. https://doi.org/10.1016/s1166-7087(08)74566-4

[6] Jackson, J. and Spiekerman, A. (1989) Testosterone Deficiency Is Common in Men with Hip Fractures after Simple Falls. *Clinical Research*, **37**, 131-136.

[7] Bubendorf, L., Schöpfer, A., Wagner, U., Sauter, G., Moch, H., Willi, N., *et al.* (2000) Metastatic Patterns of Prostate Cancer: An Autopsy Study of 1589 Patients. *Human*

Pathology, **31**, 578-583. https://doi.org/10.1053/hp.2000.6698

[8] Taylor, H.G., Lefkowitz, M., Coggin, J.T., Skoog, S.J., Miles, B.J. and McLeod, D.G. (1984) Intracranial Metastases in Prostate Cancer. *Cancer*, **53**, 2728-2730. https://doi.org/10.1002/1097-0142(19840615)53:12<2728::aid-cncr2820531231>3.0.co;2-x

[9] Saitoh, H., Hida, M., Shimbo, T., Nakamura, K., Yamagata, J. and Satoh, T. (1984) Metastatic Patterns of Prostatic Cancer: Correlation between Sites and Number of Organs Involved. *Cancer*, **54**, 3078-3084. https://doi.org/10.1002/1097-0142(19841215)54:12<3078::aid-cncr2820541245>3.0.co;2-u

[10] Brownson, R.J. (1969) Adenocarcinoma of the Prostate Presenting as a Frontal Sinus Mucocele. *The Laryngoscope*, **79**, 458-469. https://doi.org/10.1288/00005537-196903000-00012

[11] Toomey, J.M. and Frazer, J.P. (1967) Metastatic Adenocarcinoma of the Frontal Sinus. *Archives of Otolaryngology—Head and Neck Surgery*, **85**, 407-409. https://doi.org/10.1001/archotol.1967.00760040409012

[12] Jiménez Oliver, V., Lazarich Valdés, A., Dávila Morillo, A., Molina Ruiz Del Portal, J., Conde Jiménez, M., FernÁndez Ruiz, E., *et al.* (2001) Metástasis fronto-etmoidal de adenocarcinoma prostático. Presentación de un caso clínico y revisión de la literature [Frontal Ethmoid Metastases of Prostatic Carcinoma. Report of One Case and Review of the Literature]. *Acta Otorrinolaringológica Española*, **52**, 151-154. https://doi.org/10.1016/s0001-6519(01)78191-5

[13] Maschka, D.A., McCulloch, T.M. and Nerad, J.A. (1996) Prostate Cancer Metastatic to the Orbit. *Annals of Otology, Rhinology & Laryngology*, **105**, 70-71. https://doi.org/10.1177/000348949610500113

[14] Har-El, G., Avidor, I., Weisbord, A. and Sidi, J. (1987) Carcinoma of the Prostate Metastatic to the Maxillary Antrum. *Head & Neck Surgery*, **10**, 55-58. https://doi.org/10.1002/hed.2890100109

[15] Saleh, H.A., O'Flynn, P. and Jones, N.S. (1993) Prostatic Metastases in the Nose and Paranasal Sinuses. *The Journal of Laryngology & Otology*, **107**, 629-632. https://doi.org/10.1017/s0022215100123928

[16] Lund, V.J., Stammberger, H., Nicolai, P., *et al.* (2010) European Position Paper on Endoscopic Management of Tumours of the Nose, Paranasal Sinuses and Skull Base. *Rhinology Supplement*, **22**, 1-143.

[17] Prescher, A. and Brors, D. (2001) Die Metastasenabsiedlung in die Nasennebenhöhlen: Fallmitteilung und Literaturübersicht. *Laryngo-Rhino-Otologie*, **80**, 583-594. https://doi.org/10.1055/s-2001-17835

[18] Bernstein, J.M., Montgomer, W.W. and Balogh, K. (1966) Metastatic Tumors to the Maxilla, Nose, and Paranasal Sinuses. *The Laryngoscope*, **76**, 621-650. https://doi.org/10.1288/00005537-196604000-00003

[19] Tremont-Lukats, I.W., Bobustuc, G., Lagos, G.K., Lolas, K., Kyritsis, A.P. and Puduvalli, V.K. (2003) Brain Metastasis from Prostate Carcinoma: The M.D. Anderson Cancer Center experience. *Cancer*, **98**, 363-368. https://doi.org/10.1002/cncr.11522

[20] Hatzoglou, V., Patel, G.V., Morris, M.J., Curtis, K., Zhang, Z., Shi, W., *et al.* (2012) Brain Metastases from Prostate Cancer: An 11-Year Analysis in the MRI Era with Emphasis on Imaging Characteristics, Incidence, and Prognosis. *Journal of Neuroimaging*, **24**, 161-166. https://doi.org/10.1111/j.1552-6569.2012.00767.x

[21] Salvati, M., Frati, A., Russo, N., *et al.* (2005) Brain Metastasis from Prostate Cancer. Report of 13 Cases and Critical Analysis of the Literature. *Journal of Experimental &*

Clinical Cancer Research, **24**, 203-207.

[22] Gzell, C.E., Kench, J.G., Stockler, M.R. and Hruby, G. (2013) Biopsy-Proven Brain Metastases from Prostate Cancer: A Series of Four Cases with Review of the Literature. *International Urology and Nephrology*, **45**, 735-742. https://doi.org/10.1007/s11255-013-0462-7

[23] McCutcheon, I.E., Eng, D.Y. and Logothetis, C.J. (1999) Brain Metastasis from Prostate Carcinoma: Antemortem Recognition and OUTCOME after treatment. *Cancer*, **86**, 2301-2311. https://doi.org/10.1002/(sici)1097-0142(19991201)86:11<2301::aid-cncr18>3.0.co;2-d

[24] Caffo, O., Gernone, A., Ortega, C., Sava, T., Cartenì, G., Facchini, G., *et al.* (2011) Central Nervous System Metastases from Castration-Resistant Prostate Cancer in the Docetaxel Era. *Journal of Neuro-Oncology*, **107**, 191-196. https://doi.org/10.1007/s11060-011-0734-y

[25] Durrani, U., Rifai, K., Arshad, M., Paracha, A., Deol, E., Paracha, M., *et al.* (2024) Leptomeningeal Metastases in Prostate Cancer: A Review of the Current Literature. *Current Urology*, **18**, 159-166. https://doi.org/10.1097/cu9.0000000000000245

[26] Daoud, S.M., Benatta, H. and Messid-Bouchakour, M. (2023) Métastase cérébrale d'un cancer de la prostate à propos d'un cas, et une revue de la littérature. *Journal de Neurochirurgie*, **36**, 28-30.

[27] Arnaout, M.M., Hoz, S., Lee, A. and Taha, M. (2024) Management of Patients with Multiple Brain Metastases. *Egyptian Journal of Neurosurgery*, **39**, Article No. 64. https://doi.org/10.1186/s41984-024-00321-5