

## “The Subdural Collection” a Great Simulator: Case Report and Literature Review

### Abstract

Prostate carcinoma rarely develops intracranial metastasis. In case it does, the dura is the most affected area. In general, brain computed tomography (CT) findings mimic subdural hematoma making surgery challenge. We report the case of a 52-year-old male, presented as an emergency with a month history of headache, progressive temporospatial disorientation, mental confusion, and abrupt consciousness deterioration up to coma occurring few hours prior admission. An urgent brain CT scan showed a subdural collection in favor of a chronic subdural hematoma. The patient underwent surgery by standard burr hole, and surprisingly, peroperatively, there was a very bloody diffuse thickening of the dura without a real hematoma obliging to switch to a large fronto-temporoparietal craniotomy revealing a subdural mass that was completely removed. Histopathology disclosed a metastatic prostatic carcinoma confirming that such a subdural collection could behave as a great simulator. A contrast brain CT scan, is advisable, even in emergency, in selected case, with atypical images finding, especially if, a malignant disease is already known; the former could be of great help in the differential diagnosis and the best prompt management.

**Keywords:** Chronic subdural, dura mater, hematoma, metastasis, prostate carcinoma

### Introduction

Intracranial metastases of prostate carcinoma are very rare while dural metastases are even rarer.<sup>[1]</sup> Usually, dura and subdural space are involved,<sup>[2]</sup> being the prostate carcinoma the main source of dural metastases.<sup>[3]</sup> In addition, especially in emergency case, a noncontrast-enhanced brain computed tomography (CT) scan findings might be easily mistaken for subdural hematoma (as happened in the present case)<sup>[4,5]</sup> or meningioma.<sup>[6,7]</sup> In the present report, the authors describe such a rare occurrence discussing clinical features, imaging, and surgical management along pertinent literature.

### Case Report

We report the case of a 52-year-old male presented as an emergency with 1 month history of progressive headache, temporospatial disorientation, confusion, and abrupt consciousness deterioration occurring few hours prior admission; the patient suffered 1 month earlier of a mild head trauma. The patient past medical history consisted of prostatic adenocarcinoma with bony metastases

already treated by chemotherapy. On admission, neurological examination showed a Glasgow coma scale of E1-V2-M5 8/15 with left hemiplegia obliging intubation and mechanical ventilation. An urgent brain CT scan was in favor of a subdural collection, causing an important mass effect with midline shift, suggestive, in the first instance, of a chronic subdural hematoma (CSH) [Figure 1]. Given the rapid clinical deterioration the patient underwent emergent surgery by a standard burr hole; surprisingly the per-operative finding was consisted of a very bloody diffuse thickening of the dura without a real hematoma obliging to convert the procedure to a large fronto-temporo-parietal (F-T-P) craniotomy. During the subgaleal dissection, the right temporal muscle was found invaded by a tumor-like mass extending forward to the right sphenoid wing, thus removed, and the temporal bone showed sclerotic changes with an irregular cauliflower-like aspect. After performing a large F-T-P craniotomy, the dura appeared extensively thickened, and once incised, a large subdural mass sitting on the F-T-P cortex was identified, subsequently dissected and removed [Figures 2 and 3]. The patient

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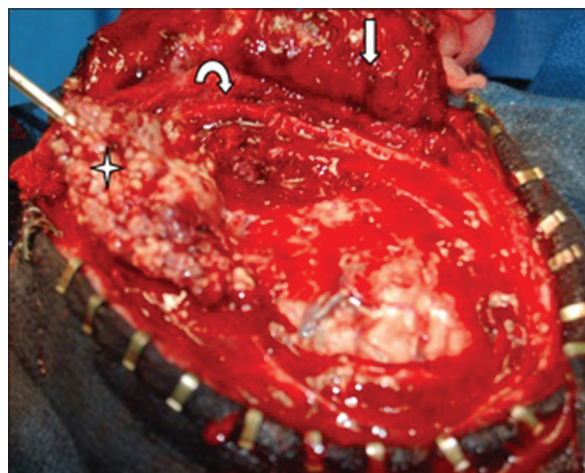
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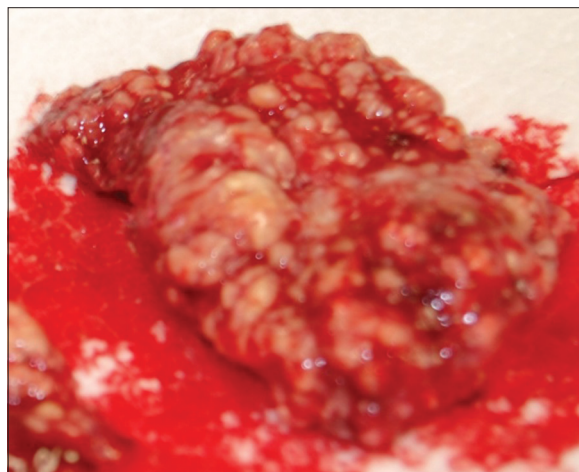
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**Figure 1:** Preoperative brain axial computed tomography scan without contrast showing a right hypo-iso-dense collection in favor of a chronic subdural hematoma



**Figure 2:** Peroperative image showing: Sclerotic change in the right temporal bone, and temporal muscle infiltration. The dura was diffusely thickened with a firm, reddish, and yellowish tumor mass underneath sitting directly on the brain



**Figure 3:** Subdural mass removed

in the postoperative stage showed a rapid neurological amelioration and left hemiplegia rapidly regressed; a

postoperative CT scan at day 2 was unremarkable, and the patient discharged home at postoperative day 4. Histopathology revealed a prostatic carcinoma metastasis. The patient underwent postoperative standard whole brain radiotherapy. Unfortunately, the disease progressed very rapidly and the patient despite the good neurological outcome and all the treatments performed, passed away 5 months later.

## Discussion

Although prostate carcinoma is the second most common malignancy found in males, metastatic prostate adenocarcinoma to the central nervous system is a rare finding.<sup>[8]</sup> In the international literature, few reports about dural metastases of prostate cancer mimicking a subdural hematoma could be found.<sup>[9,10]</sup> In those cases, dural metastases were unsuspected initially, and the diagnosis was only revealed during surgery. Autopsy studies report the frequency of cerebral metastasis in patients with prostate cancer to range from 1% to 6%.<sup>[11]</sup> In a large review of 16.280 patients with prostate cancer, only 0.63% were found to have brain metastases.<sup>[11]</sup> Prostate carcinoma central nervous system metastases are considered a terminal event with an estimated median of survival of 3.5 months in patients treated by radiotherapy.<sup>[11]</sup> In cases with subdural disease, the dura, which usually acts as a barrier to metastatic penetration, is usually well maintained.<sup>[11]</sup> Our case was quite peculiar showing a muscle, bony, dural, and subdural extension of the tumor. Another interesting feature is that the presence of osteoblastic change of prostate cancer can mimic meningioma and can sometimes be misdiagnosed.<sup>[12]</sup> Among the intracranial localization of metastatic prostate cancer, the dura is the most common site accounting to 67%, in 25% the cerebral cortex is involved, and cerebellum in 8% of case.<sup>[13]</sup> The physiopathology of cerebral prostatic metastasis is thought to be a transvenous migration. The timing of this finding in such a disease suggests that such migration may be related either to a compromised blood-brain barrier or to a depression of immune function.<sup>[13]</sup> In addition, the association of chronic subdural hematoma (CSH) to metastatic localization has been reported; the possible mechanisms involved include (1) hemorrhagic effusion by dural metastases,<sup>[14]</sup> (2) dural venous obstruction, and (3) dura angiodesmoplastic reaction to tumoral invasion. Furthermore, the neovascularization related to chronic subdural membranous proliferation could itself be the way of transmembranous migration of metastatic cells across the dural barrier.<sup>[15]</sup> It should bear in mind that dural metastases of such a disease are usually a late manifestation while the CSH is a common and benign disease, thus the preoperative differential diagnosis is very important. A contrast-enhanced brain CT might be advisable (even in emergency case) for patients with atypical images finding and in whom dural metastasis is suspected. This should reveal a homogeneously enhanced dural thickening being

not present in case of CSH. MRI scan may provide better resolution than CT, by multiplanar imaging, and also could detect small brain metastatic extension. The present case highlights the interest of the broad differential diagnosis of CSH which could include lymphoma, neurosarcoidosis, tuberculosis, and other secondary neoplastic lesions such as melanoma and breast cancers.<sup>[7,11,16-19]</sup> Finally, it is worth to remember that clinically the headache is the most common symptom being variably associated to consciousness dysfunction due to raised intracranial pressure. Cranial nerve involvement, as well as facial sensory disturbances, are uncommon features of such a disease and they could be the result of skull base invasion.<sup>[20,21]</sup> Coming back to the present case, we discussed extensively with our neuroradiologist all clinical and imaging features drawing the following conclusion: (1) The preoperative brain CT scan [Figure 1] showed also the right temporal muscle swelling (not noticed) which is atypical 1 month after a mild head injury, and it could have dealt to suspect other pathology/lesion; (2) the CT scan [Figure 1] also show a relatively thin subdural mass causing remarkable brain shift with an irregularly-shaped filling between the mass and the brain surface. The formers features could have probably raised the suspicion of disease other than a CSH.

## Conclusion

Prostate cancer dural metastasis should be suspected in all patients with malignant tumors because its treatment strategy and prognosis are completely different from a benign CSH.<sup>[22,23]</sup> Management of such pathology consists essentially in surgical resection associated to high-dose of corticosteroid and whole-brain radiotherapy in the attempt of improving the overall survival which is unfortunately still of few weeks/months.

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## Conflicts of interest

There are no conflicts of interest.

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