

Prostate cancer presented with de novo brain metastases as initial manifestation: A case report with review of the literature

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Introduction

Prostate cancer is the most common cancer and among the leading causes of cancer death in men and its clinical symptoms vary a lot. The most common metastatic site is the bones [1], but rarely prostate cancer can

metastasize to brain in very advanced stages of the disease. However, brain metastases giving neurological symptoms as first manifestation of prostate cancers have been reported. Research of international literature revealed only seventeen patients (including our own) that were diagnosed with prostate cancer presented with neurological symptoms (Tables 1, 2).

case number	Gender	duration of symptoms	presenting symptoms	MRI findings	PSA*	Recurrence	Symptoms	Ref.
1.	70	2 y	headedness, loss of balance	cystic lesion in the left cerebellum obstructive hydrocephalus mass effect in the posterior fossa	3.3	left cerebellum (19m)	confusion	(15)
2.	56	N/A	mild expressive aphasia and right-sided weakness	cystic lesion in the left parietal lobe	N/A	N/A	N/A	(15)
3	76	4m	personality change forgetfulness episodic confusion difficult with short memory	cystic mass right frontal horn and midline shift	2.1	N/A	N/A	(16)
4	56	6m	partial complex seizures left cheek pain left orbital pain peri-orbital swelling, and diplopia	large ring-enhancing lesion in the left anterior temporal lobe	> 100	N/A	N/A	(17)
5	56	8w	dysphasia	contrast-enhancing mass	1.4	N/A	N/A	(18)
6	65	1m	left eye ptosis	contrast-enhancing mass	645	N/A	N/A	(18)
7	71	concurrent	progressive leg weakness headaches poor concentration lack of co-ordination of his left arm.	isolated cerebellar space occupying lesion	5	N/A	N/A	(19)
8	62	1w	headaches acute onset of confusion	temporoparietal intracerebral hematoma small acute subdural hematoma in the temporal region.	N/A	N/A	N/A	(20)
9	65	2m	headaches gait disturbance incoordination memory loss lethargy	nonenhancing right cerebellar lesion obstructive hydrocephalus	N/A	N/A	N/A	(9)
10	55	concurrent	lean to the right fullness in his face headaches	enhancing mass measuring in the left pons/left cerebral peduncle	11.5	N/A	N/A	(13)
11	70	2m	weakness, dizziness left hemiparesis	parietal mass with central hemorrhage	100	N/A	N/A	(21)
12	62	2m	nausea, vomiting, anorexia left-sided weakness	right posterior fossa mass	11.7	N/A	N/A	(21)
13	57	none	none	mass in the right frontoparietal area	N/A	N/A	N/A	(22)
14	46	concurrent	headache confusion	right cerebellar hemisphere	N/A	N/A	N/A	(23)
15	52	concurrent	headaches buzzing in the ears	lesion in the pineal gland and hydrocephalus	N/A	N/A	N/A	(24)
16	62	6d	headache	intracerebral hematoma of the right temporoparietal cortex	N/A	N/A	N/A	(25)

Table 1: Reported cases of brain metastasis from prostate cancer. d: days, m: months, N/A: Not assessed, w: weeks, y: years * PSA value at diagnosis

case number	First Diagnosis of Prostate cancer	Treatment of first diagnosis	Time to brain metastases	Ref.
1	NO	RT	12y	(15)
2	NO	radical prostatectomy AND RT	4y	(15)
3	NO	RT	9y	(16)
4	YES	de novo	de novo	(17)
5	NO	N/A	N/A	(18)
6	YES	de novo	de novo	(18)
7	YES	de novo	de novo	(19)
8	YES	de novo	de novo	(20)
9	YES	de novo	de novo	(9)
10	NO	radical prostatectomy AND RT	2y	(13)
11	YES	de novo	de novo	(21)
12	YES	de novo	de novo	(21)
13	NO	prostatectomy	3y	(22)
14	YES	de novo	de novo	(23)
15	YES	de novo	de novo	(24)
16	YES	de novo	de novo	(25)

Table 2: Reported cases of brain metastasis from prostate cancer with de novo presentation or after local therapy. N/A: Not assessed, y: years

Case report

A 61-years-old man, ex-smoker of 25 pack-years, with free personal history and positive family history, presented with headache and tingled right hand. From the physical examination there was reduced muscular strength of the right hand. A brain CT demonstrated multiple secondary metastases (Fig. 1) and the patient started WBRT.

For the finding of the primary site we did lung and abdomen CT, bronchoscopy, endoscopy of larynx, upper GI endoscopy and colonoscopy which did not show something pathological. From the tumor markers of the patient we had CEA 44,6ng/ml (<4,7), PSA 12,94ng/ml (<4), NSE 15,9 (<16,3). Due to the raised PSA we did a prostate U/S, which showed hypertrophy of the gland. In the figure- rectal examination we found a tough prostate and the biopsy of the gland showed a prostate adenocarcinoma (Fig. 2). Then we did a bone scanning which revealed one secondary lesion on the 4th thoracic vertebra.

Unfortunately his neurological symptoms got worse before the start of the hormonotherapy and, finally, the patient died.

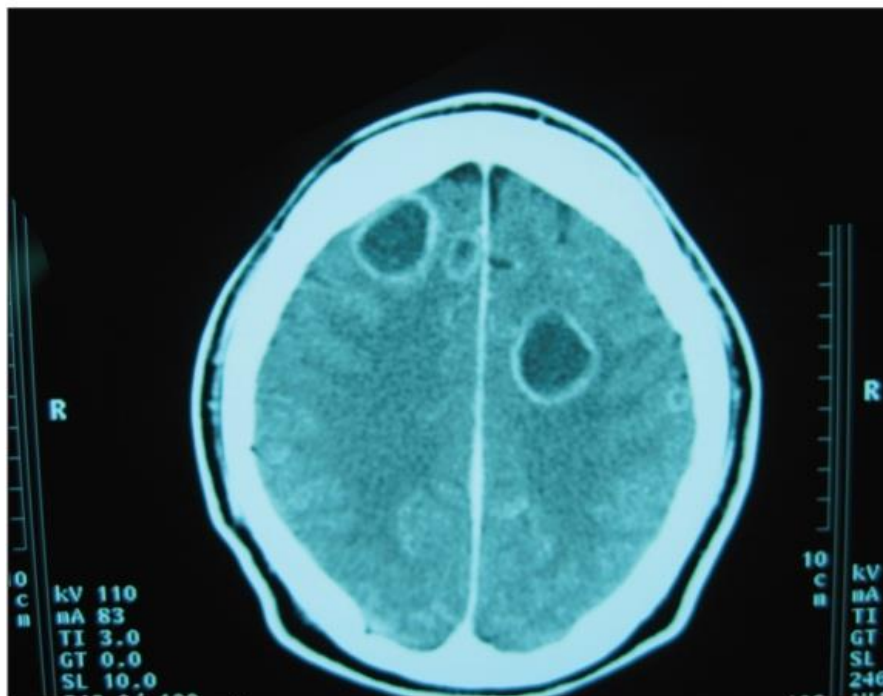


Figure 1: Brain computed tomography (CT) showing multiple secondary metastases

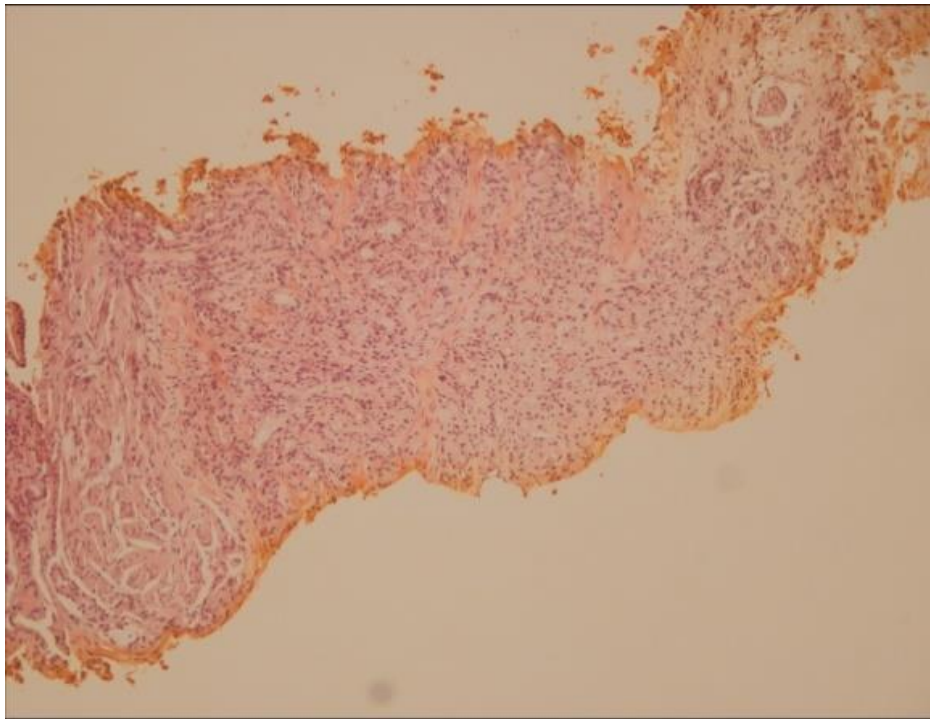


Figure 2: The histopathological diagnosis of *adenocarcinoma* of the *prostate* in needle core *biopsy* specimen

Discussion

Prostate cancer is the most common cancer among men and it is the second leading cause of death due to cancer [2]. It represents 26% of all new diagnosed cancers in men and 9% cancer-related deaths [3]. The risk for prostate cancer increases steeply with age. The rise in incidence is basically explained by improved detection capability, using prostate-specific antigen (PSA) and transrectal ultrasound [4–6].

The disease spreads by local extension through the capsule and seminal vesicles, the lymphatic system to regional nodes or hematogenously to bone and visceral sites. Bone is the most common site of prostate cancer metastases, producing predominantly osteoblastic lesions rather than osteolytic, although both types may coexist [6].

Brain metastases are present, especially in advanced stages of the disease. Adenocarcinomas of the prostate can metastasize to the brain from either metastases in the lungs and the bones (multistep or cascade theory) [7], or primarily to the central nervous system (single step theory) [8]. The most common intracranial sites of prostate cancer metastases are the dura (67%), cerebrum (25%) and cerebellum (8%) [9].

Almost always, intracranial metastases develop after the diagnosis of the prostatic adenocarcinoma is established; however, intracranial metastases are often difficult to detect, clinically silent and primarily diagnosed at autopsy. The mean time interval between initial diagnosis of prostatic cancer and diagnosis of intracranial metastases is 5,1 years [10].

Interestingly, the literature contains only 16 patients in which neurological symptoms secondary to intracranial metastases have served as the first sign of prostatic adenocarcinoma [11]. Headache, motor dysfunction and seizure appear to be the most common symptoms associated with metastatic prostate cancer.

Treatment options include radiosurgery, conventional external beam radiotherapy and surgery. Radiotherapy in combination with high doses of dexamethasone may be beneficial [12]. Craniotomy also appear to

lengthen survival time¹⁴ and hormonal treatment appear to have some efficacy [13-14].

Conclusion

Although neurological symptoms as a first clinical manifestation of prostate cancer are rare, it should be included in the differential diagnosis of a patient presented with secondary symptoms from intracranial metastases. Clinicians should have an index of suspicion for prostate cancer, check PSA and do prostate ultrasound during the investigation of the primary site in a patient presented with secondary brain metastases. Early detection and treatment should be the primary goal, as they may lengthen the survival for some patients with adenocarcinoma of the prostate.

Conflicts of interest: The authors declare that they have no conflict of interest.

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