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CASE REPORT

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Facial nerve palsy as the presenting feature of metastatic prostatic cancer in the temporal bone

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ABSTRACT

Metastasis of malignant tumors to the temporal bone is relatively rare. We report a case of facial nerve palsy due to the metastatic prostatic cancer to the temporal bone with favorable and functional results. A 76-year-old man with no history of malignant tumor was referred to our hospital with a complaint of right facial nerve palsy. Based on radiological findings and a biopsy from the prostate, the patient was finally diagnosed as having metastatic prostatic cancer to the right temporal bone. More than 18 months had passed after start of the hormonal therapy, the metastatic lesion of the temporal bone had diminished, and the facial nerve palsy gradually improved. The present case suggests that favorable and functional results even in advanced metastatic prostatic cancers to temporal bone, if hormonal therapy is effective. We must keep in mind the possibility of metastatic tumor in the treatment of facial nerve palsy.

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Prostatic cancer; temporal bone; facial palsy; PSA; hormonal therapy

Introduction

Metastasis of malignant tumors to the temporal bone is relatively rare. Breast, lung, and prostatic cancers have been reported as primary tumors [1]. Although it is often asymptomatic, symptoms such as deafness, otalgia, cranial nerve palsies, and/or dizziness may be observed as tumors grow [2,3]. In general, the prognosis of the patients with distant metastatic cancer is unfavorable. However, in case of cancers sensitive to systemic therapies, long-term survival can be expected. Here, we report a case of right facial nerve palsy due to a metastatic prostatic cancer to the temporal bone with favorable oncological and functional results.

Case report

A 76-year-old man with no history of malignant tumor visited our affiliated hospital with a complaint of right pulsatile tinnitus. Magnetic resonance imaging (MRI) scan showed an abnormal shadow around the right jugular foramen. He had been followed up with the diagnosis of glomus tumor. However, 5 months after the first visit, he developed right facial nerve palsy and dizziness, and was referred to our hospital. At the time of the first visit to our hospital, he presented complete facial nerve palsy (House-Brackmann grade 6). Dizziness had been improved with the steroids prescribed by the previous hospital and hearing abilities were within normal limit. No nystagmus or neurological symptoms other than right facial palsy were presented. MRI showed an abnormal shadow in the right petrous apex (Figure 1(A,B)) and computed tomography (CT) showed a sclerotic bone lesion in the right temporal bone (Figure 1(C)), suggesting the malignant tumor metastasis to the temporal bone. Fluodeoxyglucose (FDG) – positron emission tomography (FDG-PET) imaging showed increased accumulation on the left side of the prostate and bones of the whole body including right temporal bone, vertebral body, and iliac bone with sclerosis (Figure 2). Serum PSA level was remarkably increased up to 1802 ng/mL. MRI of the prostate suggested the left prostatic cancer. Technetium 99 m scintigraphy showed intense radiotracer uptake in the right temporal bone, sternum, spine, and right iliac bone. A biopsy of the prostate revealed adenocarcinoma and

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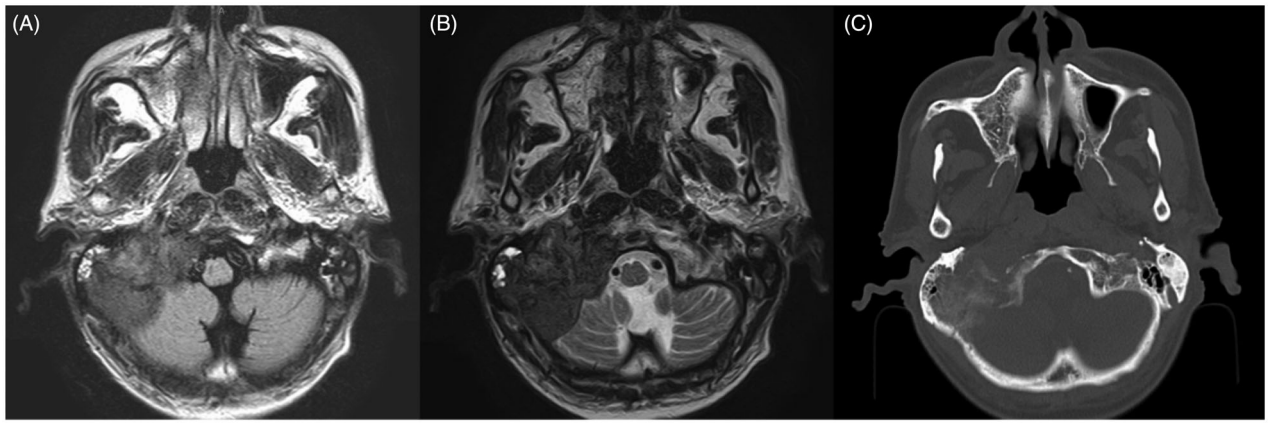

Figure 1. MRI and CT imaging at the time of diagnosis. MRI showed massive lesion with equal intensity on T1 weighted image (A) and low intensity on T2 weighted image (B) in right petrous apex. CT showed light bone sclerosis of right temporal bone matching the tumor lesion.

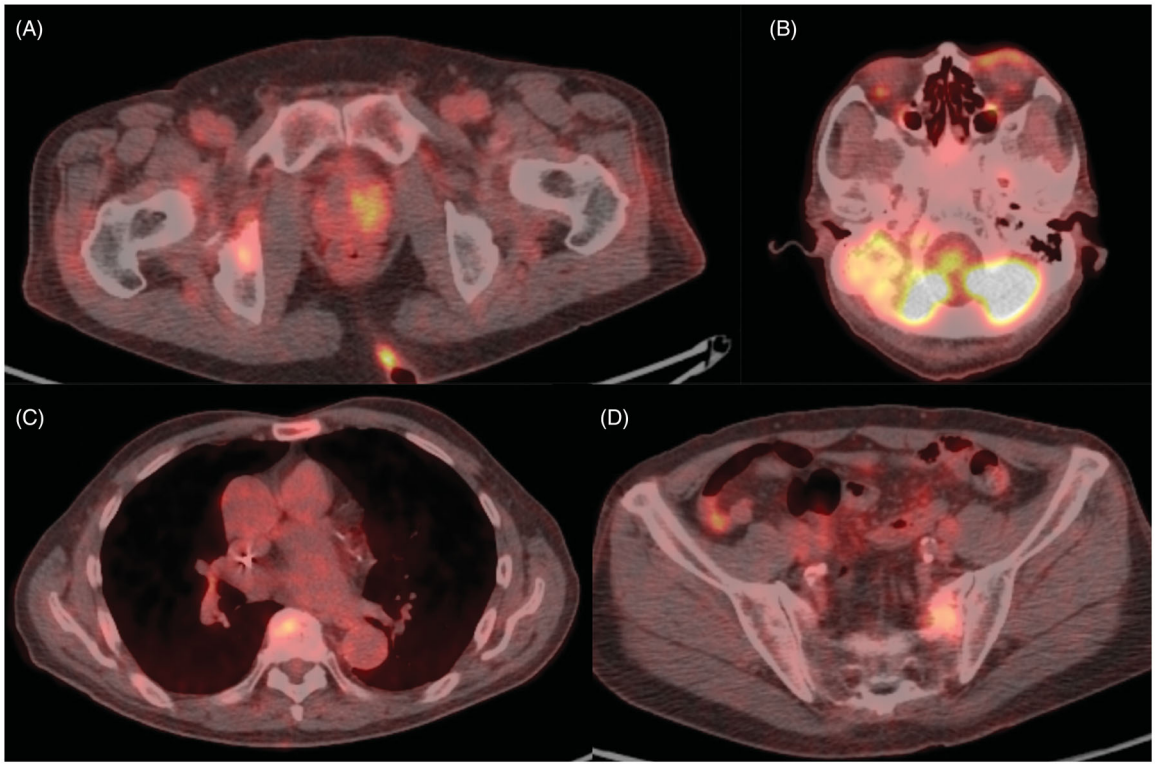

Figure 2. PET-CT imaging at the time of diagnosis. FDG-PET/CT showed accumulations on the left side of prostate (A), right temporal bone (B), vertebral body (C), and iliac bone (D). Bone sclerosis images consistent with the same site were observed.

prostatic cancer (Gleason score 4 + 4, cT3N0M1) was made. Hormonal therapy consisting of degarelix acetate and bicalutamide was started 3 months after the first visit to our department. After start of the hormonal therapy, serum PSA level was remarkably decreased, and the metastatic lesion of the temporal bone had diminished. Facial nerve palsy gradually improved up to grade 3 after 6 months, and grade 2 after 12 months. He had been followed up with hormonal therapy for 18 months with undetectable serum PSA level. Osteoblastic change in the temporal bone decreased on CT (Figure 3).

Discussion

According to the report by Streitmann et al., among the 141 cases of malignant tumors metastasizing to the temporal bone, primary lesions were breast cancer in 35 cases (25%), lung cancer in 16 cases (11%), prostatic cancer in 8 cases (5.7%) and primary was

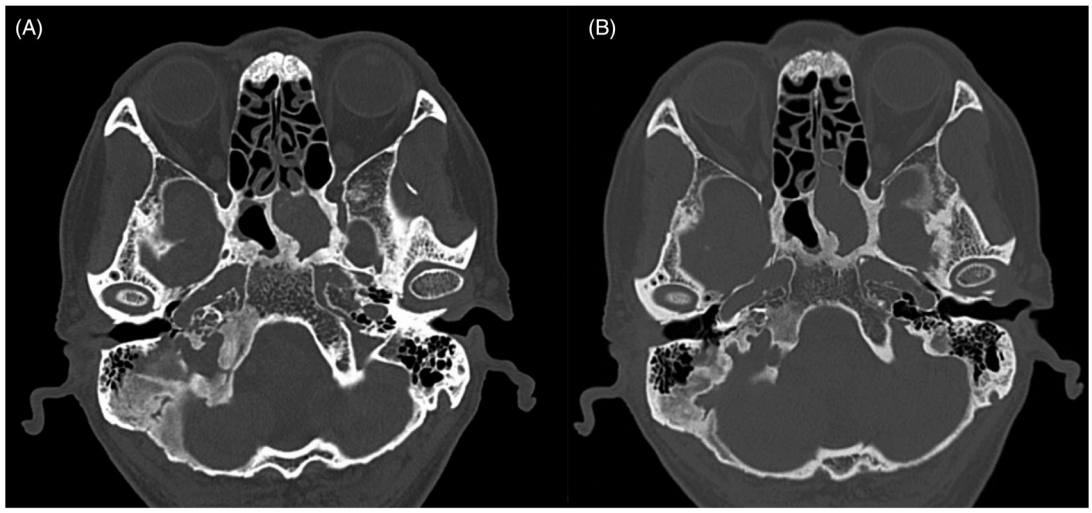

Figure 3. CT imaging during hormonal therapy. The bone sclerosis lesion has been shrinking by the hormonal therapy. (A) 3 months after the start of hormonal therapy. (B) 18 months after the start of hormonal therapy.

unknown in 16 cases (11%). Within the temporal bone, the petrous apex is the most common site of metastasis of malignant tumors, followed by the mastoid, internal auditory canal and middle ear cleft, in this order [1,2]. The temporal bone is rich in blood flow and its slow flow provides a favorable growth environment for tumor cells. Prostatic tumor cells reach the vertebral venous plexus (Batson's plexus) as abdominal pressure increases. It is thought that hematogenous metastases to the cerebral veins and dural sinuses, and finally reach the temporal bone [2].

Symptoms of prostatic cancer are often poor and the stage of disease is advanced at the time of diagnosis [4]. According to Gloria-Cruz et al., 36% of malignant temporal bone metastases were asymptomatic [3]. Reported symptoms that can be seen are otalgia, dizziness, hearing loss, and facial nerve palsy.

To date, 10 cases of facial nerve palsy caused by temporal metastasis of prostatic cancer have been reported (Table 1) [2,5–12]. Three cases of them were diagnosed to have temporal bone metastasis by facial nerve palsy as the only symptom. They received both hormonal therapy and radiation therapy to temporal bone metastasis, although facial nerve palsy did not improve in any of these cases. Among the 10 cases, five patients had a prior history of prostatic cancer, in which temporal bone metastasis occurred due to refractory to hormonal therapy. They were treated by radiotherapy to temporal bone metastasis. Four out of these 5 patients were simultaneously treated by steroids and, facial nerve palsy improved in all 4 patients. Facial nerve palsy did not improve in the one other patient. He died of pleural effusion approximately 3 months after radiation therapy.

In a study on cranial nerve symptoms due to skull base metastasis of prostatic cancer, O'Sullivan et al. reported 50% responding to treatment of combining radiation and steroids [13], and McDermott et al. reported 67% completely recovered and 27% partially recovered [8]. Both reports pointed out that the combination of palliative irradiation and steroids may be effective for neurological symptoms, but it is controversial because they have not been compared with cases in which steroids alone or treatment for prostatic cancer alone. Since entire right skull base was involved in tumor as shown in Figure 2(B), radiotherapy to this lesion may cause side effects such as otalgia, hearing impairment, osteonecrosis and lower cranial palsies which may result in the decline of quality of life. Thus, we employed hormonal therapy instead of radiotherapy.

In addition, nearly two year survival could be expected after prostatic cancer metastasized to the skull base [14]. Furthermore, the average survival time is about 5 months after the appearance of cranial nerve symptoms [15]. Hormonal therapy is the first choice of treatment for prostatic cancer with distant metastases. Previously used LH-RH agonists can cause urinary tract obstruction and exacerbation of bone metastases due to transient increases in testosterone. On the other hand, degarelix acetate has overcome the side effect of elevated testosterone and significantly prolongs overall survival. With regard to antiandrogen drugs, non-steroidal anti-androgens such as bicalutamide have been reported to reduce a risk of

Table 1. Reported cases of facial nerve palsy due to metastatic prostatic cancer.

No.	Author/year	Age	Involved cranial nerve	PH of prostatic Ca.	Hormonal therapy	Radiation dose	Steroids	Response	Status survival period
1	Castaldo 1983 [5]	67	CN VII	NA	NA	30Gy	NA	NA	NA
2	Jung 1986 [6]	75	CN VII, XII	NA	NA	NA	NA	NA	NA
3	Hellier 1997 [7]	60	CN VII-XII	−	+	+	NA	NA	NA
4	McDermott 2004 [8]	68	CN VII	+	Refractory	30Gy	+	CR	DOD 9M
5	McDermott 2004 [8]	68	CN VII	+	Refractory	30Gy	+	CR	DOD 29M
6	Neville 2005 [2]	54	CN VII-XII	+	Refractory	30Gy	+	CR	DOD 12M
7	Mitchell 2008 [9]	55	CN VII	−	+	20Gy	NA	SD	NA
8	Wooles 2015 [10]	NA	CN VII	−	+	+	−	NA	NA
9	Hashimoto 2016 [11]	63	CN VII-VIII	+	Refractory	62.4Gy	−	SD	DOD 3M
10	Ibrahim 2017 [12]	58	CN VII	+	Refractory	30Gy	+	SD	DOD 2W
11	Fujii 2020[a]	76	CN VII, VIII	−	+	−	+	CR	AWD 18M

Ca: carcinoma; NA: data was not available; DOD: died of disease; CR: complete response; SD: stable disease.
[a]Present case.

death compared to steroidal anti-androgens. Thus, Japanese guidelines recommend LH-RH antagonists in combination with anti-androgen drugs as primary hormonal therapy for prostatic cancer. As shown in our case, hormonal therapy can be expected to decrease tumors and improve symptoms in previously untreated prostatic cancers. After the start of the treatment, more than 18 months have passed with undetectable serum PSA level. Favorable oncological and functional results may be expected if hormonal therapy is effective even in advanced prostatic cancer.

Since imaging of metastatic tumors are non-specific, clinical course and other laboratory findings should be considered. A biopsy is required for definitive diagnosis, but is anatomically hard to approach the metastatic lesion in the temporal bone. Although no biopsy of temporal bone lesions was performed in our case, high level of serum PSA, diagnosis of adenocarcinoma by prostate biopsy, and accumulation of bone scintigraphy to temporal bone suggested temporal bone metastasis of prostatic cancer. The diagnosis was considered to be valid since the temporal bone lesion decreased after hormonal therapy.

Conclusions

A case of facial nerve palsy as the presenting feature of metastatic prostatic cancer in the temporal bone was presented. Patient was treated by hormonal therapy and has been alive with undetectable serum PSA level for more than 18 months. Prostatic cancer is often asymptomatic. Even in such an advanced case, the symptom may be only facial nerve palsy due to a metastatic lesion. Since long-term survival may be expected if hormonal therapy is effective even in advanced prostatic cancer, the possibility of metastatic tumor must be kept in mind in the treatment of facial nerve palsy.

Ethical statement

This manuscript was written in accordance with the Code of Ethics of the World Medical Association (Helsinki Declaration). We confirmed a patient's anonymity. We have obtained informed consent from the participant presented in the study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

[1] Streitmann MJ, Sismanis A. Metastatic carcinoma of the temporal bone. Am J Otol. 1996;17(5):780–783.
[2] Shine NP, O'Sullivan P. Collet-Sicard syndrome: a rare presentation of metastatic prostate adenocarcinoma. Auris Nasus Larynx. 2005;32(3):315–318.
[3] Gloria-Cruz TI, Schachern PA, Paparella MM, et al. Metastases to temporal bones from primary nonsystemic malignant neoplasms. Arch Otolaryngol Head Neck Surg. 2000;126(2):209–214.
[4] Saito T, Kasahara T, Kitamura Y, et al. [Clinical analysis of 1,000 patients with prostate cancer]. Nihon Hinyokika Gakkai Zasshi. 2006;97(3):591–597.
[5] Castaldo JE, Bernat JL, Meier FA, et al. Intracranial metastases due to prostatic carcinoma. Cancer. 1983; 52(9):1739–1347.
[6] Jung TT, Jun BH, Shea D, et al. Primary and secondary tumors of the facial nerve. A temporal bone study. Arch Otolaryngol Head Neck Surg. 1986; 112(12):1269–1273.
[7] Hellier WP, Crockard HA, Cheesman AD. Metastatic carcinoma of the temporal bone presenting as glomus jugulare and glomus tympanicum

tumours: a description of two cases. J Laryngol Otol. 1997;111(10):963–966.
[8] McDermott RS, Anderson PR, Greenberg RE, et al. Cranial nerve deficits in patients with metastatic prostate carcinoma: clinical features and treatment outcomes. Cancer. 2004;101(7):1639–1643.
[9] Mitchell DM, Wynne CJ, Cowan I. Multiple cranial nerve palsies as the presenting features of prostate carcinoma. J Med Imaging Radiat Oncol. 2008;52(2):194–196.
[10] Wooles N, Gupta S, Wilkin-Crowe H, et al. The truth is in the water: metastatic prostate cancer presenting as an intermittent facial nerve palsy. BMJ Case Rep. 2015;1-3. DOI:10.1136
[11] Hashimoto N, Ohata K, Eguchi H, et al. A case report about metastatic prostate cancer in the left temporal bone. Med J Kinki Central Hospital. 2016; 36:41–46.
[12] Ibrahim U, Saqib A, Mohammad F, et al. Facial paralysis and hearing loss: a rare manifestation of prostate cancer metastases. Cureus. 2017;9(3):e1073.
[13] O'Sullivan JM, Norman AR, McNair H, et al. Cranial nerve palsies in metastatic prostate cancer-results of base of skull radiotherapy. Radiother Oncol. 2004;70(1):87–90.
[14] Mitsuya K, Nakasu Y, Horiguchi S, et al. Metastatic skull tumors: MRI features and a new conventional classification. J Neurooncol. 2011;104(1):239–245.
[15] Seymore CH, Peeples WJ. Cranial nerve involvement with carcinoma of prostate. Urology. 1988;31(3): 211–213.