glioblastoma multiforme (GBM) of the cerebellum is rare, accounting for a small proportion of all GBM affecting the brain.1-15 GBM of the cerebellum occurs in adults with an average age of 46.7 years, while 30% of the tumours are in children with an average age of 10.4 years.1,4 There is a bimodal age distribution peaking in the 1st and 6th decades.15 To our knowledge, only 7 cases of senile cerebellar GBM have been reported, and senile cerebellar GBM has not been reported before in the Asian literature.1,3,7,10,11,13,14 Here, we report a rare case of senile GBM in the vermis of the cerebellum.

CASE REPORT

A 74-year-old right-handed man was admitted to our institution May 22, 2002 with generalized headache, nausea, vomiting, and truncal ataxia. Computed tomography (CT) and magnetic resonance imaging (MRI) revealed a round mass with ring enhancement in the vermis of the cerebellum. Subtotal removal of tumour was performed, and the pathological diagnosis was cerebellar glioblastoma multiforme. Subsequently, radiochemotherapy was performed. GBM of the cerebellum is rare and only accounts for a small fraction of all GBM. To our knowledge, there have only been 7 cases of senile cerebellar GBM reported. Our patient is one of the oldest case recorded in the Asian literature.
and his cerebellar signs were markedly improved. He underwent whole posterior fossa craniospinal radiation (56 Gy) given in 14 fractions on 5 days per week. He also received 160 mg of 1-(4-amino-2-methylpyrimidine-5-yl)-methyl-3-(2-chloroethyl)-3-nitrosourea hydrochloride (ACNU) intravenously. The first dose was administered at the beginning of radiotherapy, and the second dose was administered 4 weeks later. The patient remains well at 6 months postoperatively. Histological examination of the removed tumor specimens showed a cellular tumor composed of elongated, spindle-shaped cells with irregular, moderately pleomorphic nuclei, as well as several giant tumour cells and other cells with a gemistocytic appearance and proliferative blood vessels (Fig. 2A). Mitoses were numerous and the cytoplasm of the elongated cells showed a fibrillated appearance and positivity for glial fibrillary acidic protein (GFAP) (Fig. 2B). Proliferate labelling index by MIB-1 was 18%. The diagnosis was GBM.

**DISCUSSION**

GBM of the cerebellum is rare, and only 105 cases have been reported. Thus, GBM of the cerebellum only comprises a small proportion of all GBM of the brain (0.24 to 1.00%). In 1975, Dohrmann and Dunsmore reviewed 33 patients with primary GBM of the cerebellum. The male-to-female ratio was 2:1, and approximately 70% of the tumors occurred in adults (average age: 46.7 years), while 30% occurred in children (average age: 10.4 years). There was a bimodal age distribution, with peaks in the 1st and 6th decades. To our knowledge, only 7 cases of senile cerebellar GBM have been reported. In addition, senile cerebellar GBM has not been reported previously in Asia, and our patient is one of the oldest cases recorded in the Asian literature. Patients
typically present with increased pressure hypertension, impaired balance, and gait disturbance. On examination, they have cerebellar signs, as did our case. The diagnosis of GBM of the cerebellum is not usually suspected preoperatively, although there are certain CT and MRI features which may point towards it. Cerebellar metastasis and anaplastic astrocytoma are the common differential diagnosis in an adult. The CT appearance is often of a solid isodense lesion, which shows uniform contrast enhancement. A central low-density (necrotic) area may create ring enhancement after contrast infusion, as in our case. Zito et al. stated that CT was helpful in differentiating GBM from metastasis of the cerebellum, since the former showed little peritumoral edema or mass effect. Occhiogrosso et al. also found little peritumoral edema in patients with GBM of the cerebellum. Kuroiwa et al. reported that the differentiation of GBM from metastatic tumours or malignant astrocytoma was difficult, although the combination of heterogeneous and ring-like enhancement, midline location, poorly defined margins, tumoural haemorrhage, concomitant multicentric/multifocal lesions, and extra-axial or extracranial metastasis might be clues for the pre-operative diagnosis of cerebellar GBM. These features were helpful for differentiation in our case. On the other hand, angiography is not usually helpful as a tumour stain is not universal. Several associations with cerebellar GBM are worth noting. The role of radiotherapy in causing malignant astrocytoma of the cerebellum is uncertain. Maat-Schieman et al. reported a midline cerebellar astrocytoma that occurred after radiotherapy for craniopharyngioma. Radiotherapy may also have contributed to the development of cerebellar malignant astrocytoma after being used to treat medulloblastoma. The treatment for cerebellar GBM of our patient was radical surgical excision followed by radiotherapy and chemotherapy. Chamberlain et al. have stated that radiotherapy encompassing the posterior fossa is sufficient because subarachnoid spread is rare. The survival period is approximately 1 year after the onset of symptoms. Salzar stated that cerebellar malignant astrocytoma behaves similarly to medulloblastoma, with distant intraneural metastasis, and advocated craniospinal irradiation with a posterior fossa boost. In conclusion, to our knowledge, in the English literature, this is the oldest case of cerebellar GBM in the Asian population. We performed radical resection of the cerebellar GBM followed by radiochemotherapy. At present, the patient remains well 6 months postoperatively.

REFERENCES

13. Yamada S, Aiba T, Hara M. Primary glioblastoma multiforme of the cerebellum. Report of 2 cases and review of the litera-