remains debated. We investigated clinical features and prognostic significance of newly defined immunohistochemical subtypes that were identified by expression patterns of three B-cell differentiation markers in PCNSL. In addition, we analyzed a factor related to responsiveness to high-dose methotrexate (HD-MTX) chemotherapy. METHODS: Tumors from 32 PCNSL patients were immunohistochemically evaluated regarding expression of CD10, BCL-6, and MUM-1 and classified into subtypes according to the expression patterns of these markers. Clinical features and prognostic outcome of these subtypes were investigated. RESULTS: Twenty-three patients were treated with HD-MTX-based chemotherapy followed by whole-brain radiation therapy (WBRT), and nine were treated with WBRT alone. Three immunohistochemical subtypes were identified, including A-type expressing CD10, BCL-6, and MUM-1 (12 patients), B-type expressing BCL-6 and MUM-1 (12 patients) and C-type expressing MUM-1 only (8 patients). Response rate in the HD-MTX therapy group was 57.1% (4/7) in A-type, 87.5% (7/8) in B-type, and 75% (6/8) in C-type. C-type with the lowest metabolic activity showed significantly longer overall survival than A-type with the higher uptake of methionine (71.6 versus 39.6 months). CONCLUSIONS: Immunohistochemical identification of PCNSL based on the B-cell differentiation stage revealed three types of tumors, showing different metabolic activity and survival time. Refined immunohistochemical classification of PCNSL subtypes may become a useful tool for predicting more accurate prognosis and accessing the sensitivity to HD-MTX therapy.

ML-05

A CASE OF NEUROLYMPHOMATOSIS ARISED SECONDARILY FROM PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA

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A woman in her 40s. A biopsy of multiple intracranial lesions was performed, and the patient was diagnosed with DLBCL. As an initial treatment, 6 courses of high dose MTX therapy were performed and CR was achieved. Radiation therapy was not desired by the patient. On the 19th month after initial treatment, tumor recurrence was confirmed by MRI and added 2 courses of HD-MTX. On the 23rd month, second recurrence around the left basal ganglia were observed. One additional course of HD-MTX was performed, but due to the appearance of renal damage that was thought to be acute tubular necrosis, additional HD-MTX was not performed and whole brain irradiation was performed. She began complaining of pain in the trunk and extremities during radiation. When MRI and FDG-PET were performed in the 25th month, multiple lesions were found in the ganglia, plexus, and peripheral nerves from the cervical spinal cord to the sacral spinal cord. Cerebrospinal fluid cytology revealed atypical lymphocytes and lymphoma dissemination in the spinal cord. When intrathecal administration of the anticancer agent was performed nine times weekly, the CSF cytology was negative. Imaging findings showed that the lesions relapsed, although the lesions were temporarily reduced. After confirming that the renal function had recovered, two additional courses of HD-MTX were performed. Accumulation of FDG-PET in the lesion disappeared in the 29th month. However, peripheral neuropathic pain and paraplegia remained. Discussion: Neurolymphomatosis is considered to be a clinically rare disease that presents invasion of lymphoma into peripheral nerves including the cranial nerves, nerve roots or plexus. Diagnosis of NL has been required to be proved by nerve biopsy or autopsy, but noninvasive FDG-PET has been reported to be effective. In this case, CR was not obtained with anticancer drug intrathecal injection, and HD-MTX therapy was successful.

ML-07

R-MPV-A THERAPY FOR PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA IN THE ELDERLY: OUTCOME AND PROBLEM

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PURPOSE: R-MPV-A therapy has recently been reported to improve the outcomes of primary central nervous system lymphoma (PCNSL). Our patients have received R-MPV-A therapy since 2017 and elderly patients have only been treated with whole brain radiotherapy when they do not show a complete response after induction chemotherapy. We report the therapeutic outcomes and problems of elderly PCNSL patients treated with R-PMV-A. MATERIALS & METHODS: Eight newly diagnosed PCNSL patients received R-MPV therapy from September 2017 to June 2019. We retrospectively reviewed the cycles of R-MPV therapy, radiotherapy, consolidation high-dose Ara-C (HD-Ara-C) therapy, and the G8 score (a geriatric assessment). RESULTS: Patients were divided into three groups: Group A (71–75 years; n=2), Group B (76–80 years; n=4), and Group C (>81 years; n=2). All Group A patients finished 5 cycles of R-MPV therapy, showed a complete response, and underwent consolidation HD-Ara-C therapy. Two Group B patients showed a complete response on R-MPV therapy. One of the other patients showed a partial response after 3 cycles of R-MPV therapy, and a >3 kg reduction in body weight. The patient's G8 score was 12 points. Whole brain radiotherapy (23.4 Gy) was administered followed by local radiotherapy (21.6 Gy). One patient showed a partial response after 7 cycles of R-MPV therapy and started radiotherapy. One Group C patient received radiotherapy after 3 cycles of R-MPV because of a new lesion. The other Group C patient showed acute renal damage after 3 cycles of R-MPV. CONCLUSION: R-MPV-A therapy was relatively safe for our elderly PCNSL patients. Notably, patients >76 years of age sometimes had severe adverse effect with increased R-MPV cycles. A promising therapeutic strategy based on age and geriatric assessment is needed.

ML-08

THE ROLE OF MAINTENANCE HIGH-DOSE METHOTREXATE CHEMOTHERAPY IN ELDERLY PRIMARY CNS LYMPHOMA PATIENTS

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BACKGROUND: The addition of high-dose methotrexate (HD-MTX)-based chemotherapy to whole brain irradiation (WBRT) has improved the prognosis of primary central nervous system lymphoma (PCNSL). However, the high neurotoxicity rates observed, especially in the elderly, raised interest in chemotherapy-only treatments. Withholding radiotherapy substantially decreases the risk of neurotoxicity, however, disease control may be compromised. In the elderly who cannot tolerate WBRT as a consolidation, maintenance treatment may serve as a feasible approach after an initial response. We treated ePCNSL with induction immunochemotherapy, maintenance chemotherapy with HD-MTX and deferred WBRT. Here, we retrospectively investigated the prognosis for ePCNSL that became CR after the induction chemotherapy. MATERIAL AND METHODS: Newly diagnosed ePCNSL (median age: 74 years) received biweekly rituximab/HD-MTX for 6 cycles (induction) followed by monthly rituximab/HD-MTX for 2 cycles (consolidation) and then were treated differently according to the radiological response. With CR patients, HD-MTX was continued with every 3 months (maintenance) for 2 years. Patients who did not obtain consent for maintenance therapy were followed up. For PD patients, immunochemotherapy was interrupted and WBRT initiated immediately. Patients with PR and SD were treated with alternative chemotherapy with temozolomide and/or stereotactic radiotherapy or WBRT. RESULTS: The median PFS was 24.6 months and median OS was 27 months for the entire cohort. Of the 42 ePCNSL, 26 had CR after induction and consolidation, of which 18 cases were carried out maintenance (M+) and 8 cases were followed up (M-). Median PFS was 73 months in the M+ group and 24.5 months in the M- group. Median OS is 102.2months versus 27.6 months, respectively. Both mPFS (P= 0.0125) and mOS (P =0.0015) were significantly prolonged by maintenance therapy. CONCLUSION: It was suggested that maintenance treatment with HD-MTX may improve the prognosis for ePCNSL that reached complete response after induction therapy.

ML-09

DIAGNOSIS AND TREATMENT OF PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA IN HIV POSITIVE PATIENTS

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INTRODUCTION: HIV infection is known to cause a variety of central nervous system complications, such as malignant lymphoma (ML), toxoplasma encephalopathy, cryptococcal encephalopathy, progressive multifocal leukoencephalopathy (PML), brain tuberculosis and HIV encephalopathy. In our hospital, we performed brain biopsy for HIV-positive patients with central nervous system lesions suspected malignant lymphoma, or cases difficult to diagnose with blood, cerebrospinal fluid, and imaging alone. In this study, we retrospectively examined HIV-positive patients who underwent brain biopsy at our hospital, and analyzed diagnosis and treatment of patients with ML. Methods HIV-positive patients who underwent brain biopsy in our hospital from January 2010 to April 2019 were examined in this study. We analyzed background factors, preoperative examination results, pathological diagnosis, treatment and prognosis. RESULTS: There were 1,894 HIV-positive patients who were treated at our hospital during the