Cervical spinal cord astrocytoma

see also Cervicomedullary pilocytic astrocytoma.

Case series

2017

Eleven patients with cervical spinal cord astrocytomas and 10 healthy volunteers were recruited in a study. Conventional magnetic resonance imaging (MRI) and axial DTI were performed on a 3 tesla MRI system. Apparent diffusion coefficient (ADC), fractional anisotropy (FA), axial diffusivity (AD), and radial diffusivity (RD) values for the lesions were measured. DTT was performed using the principal diffusion direction method.

ADC values of the lesions and the normal-appearing tissue around the tumour (NATAT) on T2-weighted imaging (T2WI) increased. The ADC values of the lesions were higher. The FA values of the lesions and the NATAT decreased significantly, with the lesions having lower FA values. The RD value (1.36±0.49) of the tumours was significantly higher than those found in the healthy controls, but similar for the AD value (1.84±0.56). There were no differences in ADC or FA values between lesions and NATAT in McCormick Type I vs. Type II patients. Based on the DTT, 7 patients with solid mass tumours were classified as Type I. One patient with a solid mass, 2 patients with cystic degeneration inside the lesions, and 1 patient with a cyst around the mass were classified as Type II. CONCLUSIONS: FA values of the cervical spinal cord astrocytoma decreased, but the ADC values increased. DTI was sensitive for the evaluation of pathological changes that could not be visualized on T2WI. Our preliminary study indicates that DTT can be used to guide operation planning, and that axial images of DTT may be more valuable [1)].

2004

Kyoshima et al. from the Department of Neurosurgery, Shinshu University School of Medicine, Matsumoto, Japan, performed 8 operations on 7 patients with benign intramedullary astrocytomas and ependymomas in the cervical and cervicothoracic region. All patients initially underwent gross total tumor resection en bloc. One patient with an astrocytoma showed tumor recurrence postoperatively, and underwent a second operation resulting in subtotal removal. The follow-up after the initial surgery ranged from 2.7 to 19.7 years (mean 8.5 years). Symptomatic improvement was observed in 6 patients after the initial operation. Two patients showed postoperative neurological deterioration, one with an ependymoma and the other after the second operation. No operative complications or deaths, nor postoperative respiratory dysfunction occurred. Benign intramedullary astrocytomas and ependymomas of the cervical and cervicothoracic spinal cord can be treated by radical resection en bloc with a low morbidity and recurrence, as well as acceptable outcomes. We describe here the surgical technique for en bloc tumor removal [2)].

Case reports

2014

Brachioradial pruritus revealing cervicomedullary astrocytoma and treated with 8% capsaicin patches [3].

2007

A 23-year-old female presented with chronic occipitalgia without signs of increased intracranial pressure followed by worsening headache and slight gait unsteadiness. Cerebral magnetic resonance (MR) imaging showed no corresponding lesions. Cervical MR imaging revealed a cervical intramedullary tumor. Intraoperatively the subpial tumor was found to stretch the 3rd-5th dorsal nerve roots posteriorly, which was thought to cause the intolerable headache. Total tumor resection was achieved without requiring myelotomy using electrophysiological monitoring with somatosensory and motor evoked potentials. Histological examination identified diffuse astrocytoma. Postoperatively the headache had completely resolved. Cervical astrocytoma of subpial location is a very rare cause of headache in adults. The subpial location enables surgical extirpation because minimal or no myelotomy is needed [4].

1999

A 12-year-old male developed progressive proximal upper extremity weakness over a 3- to 4-year period. The clinical findings of proximal upper extremity weakness and atrophy, prominent scapular winging, and no sensory deficits or upper motor neuron signs suggested a neuromuscular disorder. Electromyography was consistent with a chronic denervating disorder involving the upper cervical anterior horn cells or their axons. A cervical magnetic resonance image revealed a large intramedullary mass extending from the inferior aspect of the fourth ventricle down to the level of T2. A biopsy of the lesion was consistent with a low-grade astrocytoma [5].

1997

A 21-month-old patient had developed feeding difficulty and reactive airway disease at approximately 8 months of age. MRI showed a diffuse, nonenhancing tumor in the CM region. Following radical resection, and an unremarkable perioperative course, he aspirated, developed pulmonary insufficiency and expired. Postmortem examination revealed a low-grade diffuse fibrillary astrocytoma extending from C6 to the medulla. The medullary portion arose in a paramedian location and infiltrated dorsally into the fourth ventricle, the obex, the leptomeninges, and the adjacent cerebellum. This case demonstrates the growth pattern of a distinct subset of CM tumors that behave in a manner similar to intrinsic diffuse BST. Future identification of these subsets by a careful analysis of the clinical presentation and MRI images will enable better operative planning and optimal management [6].

1996

A case of radiation necrosis and syrinx formation in a 49-year-old woman with a 5-year history of

astrocytoma grade II of the cervical cord, who progressed to quadriparesis following surgery and radiation therapy. Magnetic resonance imaging (MRI) of the cervical and thoracic spine demonstrated enlargement of upper cervical cord (C1-C6) with diffuse increased signal enhancing mass by gadolinium, as well as appearance of syrinx from T4-T10. RESULTS: Autopsy findings indeed revealed a small, residual, infiltrating glioma in the upper cervical areas, but the diffuse parenchymal abnormality seen on MRI as prolonged T2 characteristics on double-echo spin-echo sequence was revealed to be radiation necrosis. CONCLUSION: What appeared to be a cystic cavity or syrinx at the thoracic level was also diagnosed as radiation necrosis with cyst formation on histologic examination [7)].

1995

A 16-year-old boy was admitted because of lower cranial nerve dysfunction and acute hydrocephalus. Magnetic resonance images showed an intramedullary mass lesion in the upper cervical spinal cord with exophytic extension into the medullary and prepontine cisterns. The patient underwent suboccipital craniectomy and C1-2 laminectomy for decompression and histologic evaluation. The histopathologic findings were characteristic of astrocytoma grade II. Although radiotherapy was performed, the patient died 7 months later.

This is considered to be a rare case of spinal low-grade astrocytoma with ventral exophytic intracranial extension [8)].

1993

In an eight years old boy we operated an intramedullary astrocytoma grade I and reimplanted the laminae C4-7 en bloc. A good stability was achieved. Ten years later only one segment remained intact, the others showing spontaneous fusion as a major draw back. This is possibly due to subperiostal dissection and bracing. No spinal stenosis occurred. An overuse of the remaining disc C4/5 might lead to a secondary degenerative stenosis. The operation is simple and might avoid swan neck deformity in children after large decompression of dorsal structures [9)].

1992

A case of intracranial dissemination developing approximately 6 months after partial removal of a spinal cord astrocytoma in a 40-year-old male. The clinical course and postmortem findings indicate that the tumor originated in the cervical cord and extended into the subarachnoid space, first the spinal canal and later intracranially. Spinal cord glioma dissemination through the cerebrospinal fluid is more common than previously considered and indicates a dismal prognosis. An aggressive approach, including radical surgery, entire neuraxis irradiation, and adjuvant chemotherapy, is suggested as the initial treatment for malignant spinal cord glioma to prevent subsequent dissemination [10)].

1988

A 67-year-old woman developed a fixed, flexed posture of the right arm and hand due to a cervical

astrocytoma. EMG showed continuous motor unit potential firing at 8 to 15 Hz with an abnormal silent period, presumably due to the loss of local spinal cord inhibitory interneuronal input [11].

1987

An astrocytoma of the cervical spinal cord was diagnosed in a 3-year-old Siberian Husky. The dog had an 8-week history of progressive neurologic deficits that finally resulted in nonambulatory tetraparesis. Neurologic examination, CSF analysis, myelography, exploratory laminectomy and histopathologic examination were performed. Intramedullary spinal cord tumors such as astrocytomas are rare, and this case illustrates the manner in which spinal cord tumors may be confused with other nervous system diseases, both from a clinical and clinicopathologic standpoint [12].

1983

The case of a 35-year-old woman with a cystic astrocytoma of the cervical spinal cord is presented. The use of CT investigations is stressed. The value of reformatting procedures in regard to the differential diagnosis is discussed [13].

1981

An osteoplastic laminectomy was used in an eight-year-old child suffering from an intramedullary astrocytoma extending from C4 to C7. The laminae were first of all divided bilaterally about 2 mm medial to their origin, with a fine spherical cutter. After dividing the ligamenta flava and the interspinous ligaments the dorsal wall of the spinal canal from C4 to C7 was removed en bloc. The dura was opened and the spinal cord split in the midline after which the microsurgical excision of a spindle-shaped cystic astrocytoma was carried out. After closing the dura drill holes were made bilaterally in the stumps of the pedicles and in the ends of the resected laminae. The entire piece, consisting of laminae and ligaments was replaced and fixed to the stumps of the pedicles with four pairs of wire sutures. Included in the sutures was a small block of bone measuring 2 x 3 x 5 mm, which replaced the bone lost in the saw-cuts and thus prevented any narrowing of the spinal canal. The ligaments were sutured and the wound closed in layers, with drainage. Immobilization in a Minerva plaster for three months [14].

A 31-year-old woman had been diagnosed as having in inoperable astrocytoma, grade I-II, involving the entire cervical spinal cord and two upper thoracic segments. After decompressive laminectomy, she was referred for a radical course of radiation therapy. An irradiation technique was devised which allowed treatment of a single cylindrical volume of tissue encompassing the known tumor. Field fractionation with undesirable gaps and/or excessive dose to overlying normal structures were avoided. To the cervical spinal cord she received 5590 cGy in 29 fractions over 42 days. By this schedule she received at the same time 4820 cGy to the medulla oblongata and 4880 cGy to the upper thoracic cord. Partial neurological improvement occurred at the end of the treatment. The treatment approach is discussed in the background of the literature data [15].

1)
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