Spinal cord tumor

- Machine learning-driven national analysis for predicting adverse outcomes in intramedullary spinal cord tumor surgery
- Solitary Plexiform Neurofibroma in the Urachus Associated With von Recklinghausen's Disease
- Androgen deprivation therapy of prostate cancer from a geriatric perspective
- Anti-Inflammatory and Analgesic Effects of Marine-Derived Antimicrobial Peptide Tilapia Piscidin 3(TP3) in Alleviating Chronic Constriction Injury-Induced Neuropathic Pain in Rats
- Dumbbell-shaped angiolipoma at the lumbar spine
- Silencing PIM1 inhibits ENO1-induced AKT activation and attenuates fibrillogenesis during spinal cord injury-induced skeletal muscle atrophy
- Dosimetric evaluation of adaptive radiotherapy in the treatment of head and neck cancer
- Rural Health: What can and cannot be done in an isolated rural neurosurgical unit

History

The surgery of tumors of the spinal cord dates back only to 1887, when a tumor was localized by Gowers and successfully removed by Victor Horsley.

The first resection of an intramedullary tumor was carried out in 1907 by Anton von Eiselsberg in Vienna.

Striking advances in our knowledge of the history and symptoms of compression of the cord have been and are still being made. The whole subject to date has been put in most clear and readable form in Elsberg's [1] book, based on one hundred cases which he personally studied and operated on. The localization of tumors of the spinal cord is easier than that of tumors of the brain, because a growth cannot attain any considerable size in the spinal canal without compressing the cord and giving definite motor, sensory and reflex signs. A careful history and repeated neurological examinations will accurately localize the great majority. Many patients have intensification of symptoms and signs after a spinal puncture, manifested by increased paralysis, or by a higher and more distinct level of sensory disturbance. The examination, therefore, should always he repeated after withdrawal of spinal fluid.

The greatest difficulty comes in attempting to differentiate very early compression from degenerative changes in the cord which simulate tumor. Dynamic and chemical studies of the spinal fluid (Queckenstedt's and Aycr's tests), are of great assistance in the detection of early partial blocks in the spinal subarachnoid spaces. A new method of diagnosis and localization was introduced in 1921 by Sicard, who showed that lipiodol introduced through a needle at the cisterna magna would be arrested at the upper margin of the tumor, where it could be demonstrated by the roentgen ray. This method unquestionably gives a perfect visual localization in the presence of a block ; but in such cases the localization can almost always be made without its use. It is irritative, and it is not absorbed in less than three years. But, more important, the lipiodol is not always arrested by a tumor. Babinski [2] and Guillain [3] have reported cases in which, after negative lipiodol tests, operations have disclosed tumors. Moreover, lipiodol sometimes shows a false arrest which has led to negative explorations. De Martel [4] has cited four such cases, operated on by him, in two of which the lipiodol localization was made by Sicard. Though the method is still subjudice, it has not lived up to the hopes which were aroused that it would, like cerebral pneumogratns in tumors of the brain, localize the few tumors of the spinal cord whose level could not be determined by other methods [5].

Epidemiology

Intramedullary spinal cord tumors (IMSCT) are rare lesions and constitute only 4-10% of all primary central nervous system tumors [6) 7)].

IMSCTs are less common in adults than in children and constitute 20% and 35%, respectively of all intraspinal tumors [8) 9) 10) 11)].

The most commonly occurring intramedullary neoplasm is spinal cord ependymoma followed by spinal cord astrocytoma and other lesions [12) 13) 14) 15)].

Astrocytomas are the most common intramedullary spinal cord tumor in pediatric and adolescent patients and the incidence decreases with age. There are very few cases of spinal pilocytic astrocytomas (World Health Organization grade 1) reported after the fourth decade [16)].

see Intramedullary astrocytoma.

see Intramedullary schwannoma.

Classification

Spinal cord tumor classification

Clinical features

Spinal cord tumor clinical features.

Diagnosis

Spinal cord tumor diagnosis

Differential diagnosis

When considering a patient with suspected spinal cord tumor, it's important to perform a thorough differential diagnosis to accurately identify the underlying cause of the symptoms. Various conditions can present with similar symptoms, so a comprehensive evaluation is crucial. Here are some potential differential diagnoses to consider when evaluating a patient with suspected spinal cord tumor:

Spinal Cord Tumors: Different types of spinal cord tumors can originate within the spinal cord (intramedullary), in the meninges (meningioma), or outside the dura mater (extradural). These tumors can include astrocytomas, ependymomas, and schwannomas. The exact type and location of the tumor can influence the symptoms and treatment approach.

Spinal Cord Compression due to Herniated Disc: A herniated intervertebral disc can compress the spinal cord or nerve roots, leading to similar symptoms such as pain, weakness, and sensory changes. It's essential to differentiate between the two.

Multiple Sclerosis (MS): MS is an autoimmune disorder that can cause demyelination of the spinal cord and brain. It can lead to symptoms like weakness, numbness, tingling, and difficulty walking.

Transverse Myelitis: This is an inflammatory condition that affects the spinal cord and leads to symptoms similar to those of spinal cord tumors, including sensory disturbances and motor weakness.

Spinal Cord Infarction: A disruption in blood supply to the spinal cord can cause ischemia and neurological deficits. Symptoms depend on the location of the infarct.

Infections: Infections such as spinal epidural abscess or tuberculosis can lead to spinal cord compression and neurological deficits.

Degenerative Spinal Conditions: Conditions like spinal stenosis, spondylolisthesis, or degenerative disc disease can cause compression of the spinal cord or nerve roots, resulting in similar symptoms.

Cauda Equina Syndrome: This occurs due to compression of the cauda equina nerve roots in the lumbar spine and can cause symptoms such as lower back pain, bowel/bladder dysfunction, and sensory/motor deficits in the lower extremities.

Vascular Malformations: Arteriovenous malformations (AVMs) or cavernous malformations can cause spinal cord symptoms due to abnormal blood flow.

Metastatic Cancer: Cancer originating elsewhere in the body can spread to the spinal cord or surrounding structures, causing compression and neurological symptoms.

Hereditary Disorders: Conditions like hereditary spastic paraplegia can cause progressive weakness and spasticity in the legs.

Other Neurological Disorders: Disorders like amyotrophic lateral sclerosis (ALS) or primary lateral sclerosis (PLS) can also cause symptoms similar to spinal cord tumors.

It's important to note that making an accurate diagnosis requires a comprehensive evaluation that may involve imaging studies (MRI, CT scans), clinical assessments, neurological exams, and possibly biopsy or other tests. A multidisciplinary approach involving neurologists, neurosurgeons, radiologists, and other specialists is often necessary to confirm the diagnosis and determine the appropriate treatment plan.

Seropositive Neuromyelitis Optica imitating an Intramedullary Cervical Spinal Cord Tumor [17)]

Treatment

see Spinal cord tumor treatment.

Outcome

Tumor histology is the most important predictor of neurological outcome after surgical resection because it predicts resectability and recurrence [18].

Adult patients

Although resection did not significantly improve QOL, it is likely necessary to arrest QOL deterioration. Patients with better preoperative neurological status or ependymoma experienced QOL improvement, while postoperative complications negatively impacted long-term QOL [19].

Pediatric patients

The prognosis for pediatric IMSCTs is favorable with sustained functional improvement expected in a significant proportion of patients on long-term follow-up. Long-term survival at 10 years (75%) and 20 years (64%) is associated with aggressive resection. Gross-total resection was also associated with improved 5-year progression-free survival (86%). Hence, the treatment benefits of GTR are sustained on extended follow-up [20].

In a small cohort of children who had undergone surgery for IMSCTs with a mean follow-up of 4.2 years, quality of life scores according to the PedsQL 4.0 instrument were not different from those in a normal sample population [21].

Case series

Spinal cord tumor case series.

Books

see Spinal cord tumor books.

1)
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2)
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