Background

- Intraventricular meningiomas are uncommon but well-described lesions which presumably arise from arachnoidal cells which are incorporated along with neuroectodermal cells during the formation of the choroid plexus.
- Solitary fibrous tumors are rare neoplasms of the dura presumably arising from mesenchymal cells with intraventricular forms presumably arising from mesenchyme incorporated during the formation of the choroid plexus.
- Herein, we describe two cases of intraventricular lesions indistinguishable by neuroimaging, a meningioma, World Health Organization (WHO) grade 2, and a solitary fibrous tumor, WHO grade 2.

Methods/Materials

- Medical records were evaluated and key findings were summarized.
- A literature search was conducted using key words including intraventricular, meningioma, solitary fibrous tumor, hemangiopericytoma.

Case Reports

Case 1: The patient is a 26-year-old woman, who has a history of seizures and a previously excised left frontal lobe meningioma, World Health Organization (WHO) grade 2.

Case 2: The patient is a 39-year-old woman who has presented with several months of worsening headaches, different from her usual migraine headaches.

Results

- Resection of the right intraventricular lesion identified a predominantly spindle cell neoplasm admixed with abundant collagen.
- The resected lesion showed a lobulated appearance externally with a solid, fleshy appearance on cross section.
- Case 2: Solitary Fibrous Tumor, CNS WHO Grade 2

- Immunoreactivity for STAT6 was present in nuclei of over 95% of neoplastic cells.
- Taken together, findings were consistent with diagnosis as solitary fibrous tumor (SFT), hemangiopericytoma pattern, WHO grade 3 using WHO 2016 criteria and SFT, WHO grade 2 using WHO CNS 2021 criteria.
- Closed surveillance imaging during the past three years has shown radiation changes with no evidence of recurrence.

Figure 1. Magnetic resonance imaging.

Figure 2. A-B. Histologic evaluation of the intraventricular lesion identified a predominantly spindle cell neoplasm admixed with abundant collagen.

Figure 3. Magnetic resonance imaging.

Figure 4. A. The resected lesion showed a lobulated appearance externally with a solid, fleshy appearance on cross section.

Figure 5. Primary brain and other CNS Tumors

References

1. Literature Review and Conclusions

- Intraventricular Lesions: Differential Diagnosis
  - The preoperative differential diagnosis of an intraventricular lesion in an adult patient often includes meningioma. While very rare in the CNS in general and extremely rare in the ventricle, the differential should also include solitary fibrous tumor.
  - Histologic evaluation is necessary to make the diagnosis.

- Intraventricular Meningiomas
  - Meningiomas are the most common primary brain neoplasm, representing 30-40% of primary intracranial neoplasms in adults.
  - Meningiomas most commonly occur in extraneural or extradural locations with intraventricular lesions uncommon.
  - Meningiomas comprise approximately 9.8 to 14% of all intraventricular tumors (2).
  - World Health Organization (WHO) grading of meningiomas ranges from grade 1 to 3 based on a variety of factors including mitotic activity, atypical features, brain invasion, and specific variants (1). In case 1, based on brain invasion, a WHO grade 2 is assigned.

- Intraventricular Solitary Fibrous Tumors (SFT)
  - Solitary fibrous tumors are rare central nervous system neoplasms that constitute less than 1% of central nervous system tumors, most supratentorial, 10% spinal, and rarely in other locations (1).
  - To our knowledge, only 29 cases of intraventricular SFTs have been published, with approximately 5% identified in the lateral ventricles where the choroid plexus is densely compared to the third and fourth ventricles (2).
  - The 2016 edition of the WHO Central Nervous System Tumors combined the previously separate classifications of solitary fibrous tumor and hemangiopericytoma as SFT, with either SFT (grade I) or HPC (Grade II or III) morphology, parallel to the reclassification undertaken previously in the WHO soft tissue (ST) classification scheme.
  - The 2021 WHO CNS Tumors edition expunged the SFT vs. HPC architectural designation and established grades 1-3, based on both mitotic activity and necrosis tumors as SFTs have a high tendency to metastasize even following gross total resection and late course in the disease (1).
  - Case 2 was originally classified as SFT, HPC pattern, grade 3 (anaplastic) based on WHO CNS 2017 criteria and now grade 2 using WHO CNS 2021 criteria.

- Intraventricular Lesions: Table 1. Grading of Meningiomas and Solitary Fibrous Tumor

- Meninigomas are the most common primary brain neoplasm, representing 30-40% of primary intracranial neoplasms in adults.
- Meningiomas most commonly occur in extraneural or extradural locations with intraventricular lesions uncommon.
- Meningiomas comprise approximately 9.8 to 14% of all intraventricular tumors (2).
- World Health Organization (WHO) grading of meningiomas ranges from grade 1 to 3 based on a variety of factors including mitotic activity, atypical features, brain invasion, and specific variants (1). In case 1, based on brain invasion, a WHO grade 2 is assigned.