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## CASE REPORT

### CEREBROSPINAL FLUID METASTASIS OF RETINOBLASTOMA IN PEDIATRIC PATIENT DIAGNOSED IN EMERGENCY HOURS IN OUR RURAL TERTIARY CARE CENTER

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#### ABSTRACT

CSF metastasis is an extremely rare event. Here, we report a case of CSF metastasis in 4-year female child patient came to OPD with the convulsion and vomiting. Clinical diagnosis was tuberculosis. They send CSF to emergency OPD and on studying CSF we see group of large number of mononuclear cells. Patient was operated in the past for retinoblastoma. The diagnosis of metastasis of retinoblastoma was given. CSF cytology is helpful for detection of metastasis. So, it should be done on mandatory basis.

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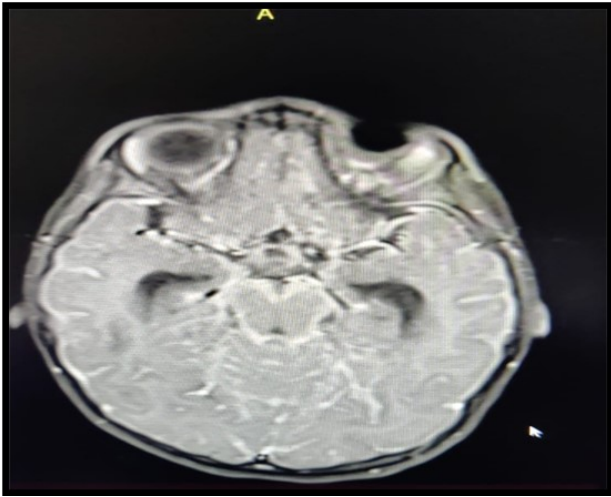
## INTRODUCTION

The incidence of cerebrospinal fluid (CSF) metastasis is 1-15% in systemic malignancies.<sup>1</sup> Higher incidence, i.e. 20% is found in autopsy studies of cancer patients suffering from neurological symptoms.<sup>1</sup> Meninges are rare sites for metastasis and devastating complication in some solid tumors, hematological malignancies and systemic malignancies.<sup>1</sup> The most common solid tumors that metastasize are from breast, lung, gastrointestinal tract, primary central nervous system.<sup>2</sup> Malignant cells spread in CSF by hematogenous route, perineural dissemination along a peripheral nerve, or by direct expansion by parenchyma.<sup>1</sup> Here we report a rare meningeal metastasis case of retinoblastoma.

## CASE REPORT

A 4-year-old female patient came to pediatric OPD with complaints of convulsion and vomiting. There was no history of fever, cough or cold. In the past history, the patient was a known case of retinoblastoma and operated with enucleation of the left eye in July 2020. The patient was taking chemotherapy since August 2020 and has received 6 cycles.

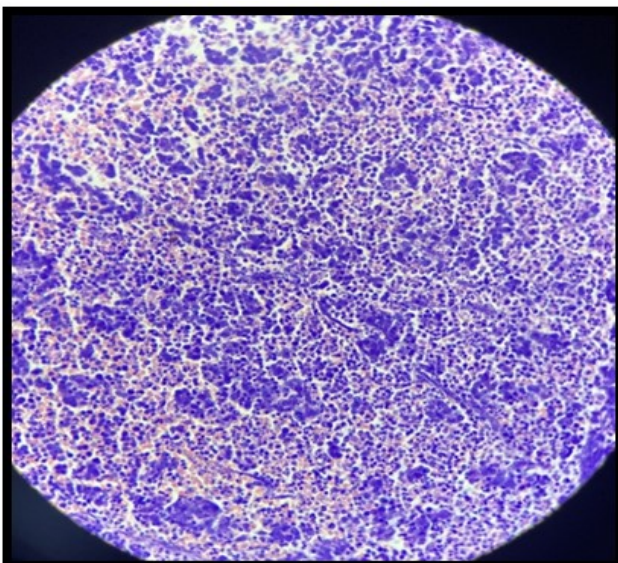
The CSF sample was sent to our department in emergency hours for analysis with the clinical diagnosis as?? TB Meningitis. Along with CSF analysis this patient's MRI brain was performed. MRI report revealed presence of diffuse leptomeningeal enhancement along with basal cisterns, bilateral Sylvian fissure, and cerebellar Folia that suggestive of meningitis (Figure 1). However, the enhancement was very diffuse so there might be the possibility of meningeal micro metastases and has to be ruled out by CSF study correlation. On physical examination, CSF sample was clear. On biochemical analysis, the CSF protein level was raised and glucose level decreased. Sample was examined under Neubauer's chamber for cell counting. The sample was centrifuged, stained with May-Grunwald Giemsa (MGG) stain. In Neubauer's chamber as well as slide showed presence of large number of small round cells in isolated form as well as in groups. For better cell yield, this sample was also processed with the cytopspin method that showed cellular smear with the same findings and the report was given as cellular smears showing presence of large number of small mononuclear cells mostly in an isolated fashion and some with rare cohesive group along with cell debris of similar cells in the background (Figure 4). The features were in favor of metastasis of retinoblastoma was given.



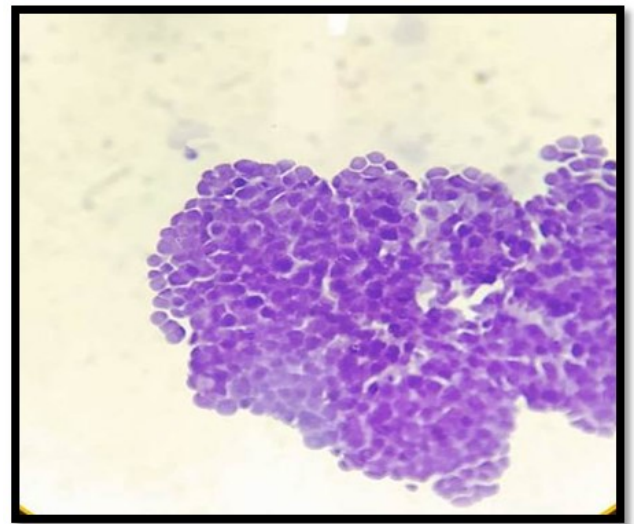
**Figure 1.** Post contrast MRI brain axial section showing diffuse leptomeningeal enhancement along the basilar cistern



**Fig. 2.** Gross specimen of enucleated eye on cut section show grey white tumor with areas of hemorrhage



**Figure 3.** Shows histopathology images of tumor in which small round cells are arranged in clusters



**Fig. 4.** Cytospin slide of CSF sample consist of small round tumor cell arranged in group

Previously 6 months back we received the enucleation specimen of left eye of this patient in our histopathological section. On gross the tumor completely involved the eye with areas of hemorrhage and necrosis (Figure 2). On microscopy it shows tumor cells are arranged in clusters and in isolated pattern with ill-defined rosettes (Figure 3). However, there was need of immunohistochemical (IHC) markers for confirmation, radiological and clinical correlation. The condition of patient was critical as she was in shock and thus intubated but her general condition was continuously deteriorating. A further treatment plan was discussed with the radiotherapist for triple intrathecal chemotherapy. But then we lost the track of the patient for follow up hence no other investigation can be done for this case.

## DISCUSSION

CSF metastasis was first described in the late 19th century.<sup>3</sup>The pathogenesis of CSF metastasis presents with an increase in the number of long-term survivors of the cancer patient and with improved systemic therapy there is chance of increasing the incidence of late-onset metastases.<sup>2</sup>Retinoblastoma cells spread diffusely through infiltrating into retina and optic nerve.<sup>8</sup>Cheng-Ying Ho *et al* shows a study in which 4 pediatric patients of retinoblastoma shows CSF metastasis and in which 2 patient's shows recurrence of CSF metastasis. Malik M *et al* shows a case of 4-year-old child with primary case of retinoblastoma along with metastasis in CSF.<sup>9</sup>J Liu *et al* also performed CSF studies of about 34 cases in which 32 were positive for malignant cells.<sup>4</sup> Irregularities such as decreased glucose, raised protein concentration, increased leukocytes, and/or increased opening pressure, are suggestive of LM.<sup>7</sup> Metastasis to retinoblastoma is difficult to treat which require intensive chemotherapy and it also shows multidrug resistance. The possibility of residual tumor cell in CNS cannot be ruled out hence patient should keep on intensive chemotherapy and under close follow up. Cytology of CSF has remained as a gold standard test along with CT, MRI Tumor marker and IHC so this investigation should be done on a mandatory basis to improve the diagnosis. So, in our case considering the age, clinical findings the other differential diagnosis can be meningitis (bacterial or viral),

tuberculosis, and autoimmune disease but because there is a past history of retinoblastoma, significant CSF findings and correlating MRI findings the diagnosis of suspicious of malignancy was given.

## CONCLUSION

CSF cytological examination can play a very important decisive role in the diagnosis of the patient with a known case of malignancies comes with the intracranial symptoms because its early diagnosis is crucial. It will help to decide treatment line and plan the further management of the patient.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. As the patient was a minor so as per rule consent of parents was obtained properly. They were well informed that the patient's name and initials will not be published due to efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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**No ethical issue is there.**

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