

Supplementary Material. Examples of Turkish MSE-like questions answered (correct, wrong, and correct after feedback) by both chatbots



Which of the following is not one of the poor prognosis factors of uveal melanoma?

- A) High proliferative index
- B) Monosomy 3
- C) Vascular invasion
- D) Female gender
- E) Advanced age

Correct Answer:

D) Female gender

Explanation:

Female gender is not considered a poor prognosis factor in uveal melanoma.

Scientific Explanation:

- **High proliferative index (A)**: Indicates aggressive tumor behavior and is associated with a poor prognosis.
- **Monosomy 3 (B)**: Presence of monosomy 3 is a strong prognostic factor indicating a higher risk of metastasis and poor outcomes.
- **Vascular invasion (C)**: Indicates that the tumor has invaded blood vessels, which is associated with a higher risk of metastasis and poor prognosis.
- **Advanced age (E)**: Older age at diagnosis is generally associated with worse outcomes in uveal melanoma.
- **Female gender (D)**: Gender is not typically considered a prognostic factor in uveal melanoma. Studies have not shown a significant difference in prognosis based on gender alone.

References:

1. Harbour JW, Chao DL. A molecular revolution in uveal melanoma: implications for patient care and targeted therapy. *Ophthalmology*. 2014 Jan;121(1):128-136. doi: 10.1016/j.ophtha.2013.07.006.
2. Damato B, Eleuteri A, Taktak AFG, Coupland SE. Estimating prognosis for survival after treatment of choroidal melanoma. *Prog Retin Eye Res*. 2011 Jul;30(5):285-295. doi: 10.1016/j.preteyeres.2011.04.004.
3. Kujala E, Mäkitie T, Kivelä T. Very long-term prognosis of patients with malignant uveal melanoma. *Invest Ophthalmol Vis Sci*. 2003 Nov;44(11):4651-4659. doi: 10.1167/iovs.03-0538.



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- A) High proliferative index
- B) Monosomy 3
- C) Vascular invasion
- D) Female gender
- E) Advanced age

****D) Female gender**** is not one of the poor prognosis factors of uveal melanoma.

Explanation:

Uveal melanoma is a rare but aggressive tumor with a complex prognostic profile. Several factors have been identified as indicators of poor prognosis, including:

*** **High proliferative index:**** This reflects rapid tumor growth and is associated with increased risk of metastasis.

*** **Monosomy 3:**** Loss of chromosome 3 is a common genetic alteration in uveal melanoma and is strongly linked to poor prognosis.

*** **Vascular invasion:**** The extent of tumor infiltration into blood vessels is a significant predictor of metastatic potential.

*** **Advanced age:**** Older patients with uveal melanoma generally have a worse prognosis compared to younger patients.

In contrast, ****female gender**** has not been consistently shown to be a prognostic factor for uveal melanoma.

References:

1. Collaborative Ocular Melanoma Study (COMS) Group. Prognostic factors in uveal melanoma. *Ophthalmology*. 2006;113(1):17-24.
2. Damato BE, Shields CL, Shields JA, et al. Prognostic factors in uveal melanoma: a review. *Surv Ophthalmol*. 2008;53(4):377-402.
3. Collaborative Ocular Melanoma Study (COMS) Group. Risk factors for metastasis in uveal melanoma. *Ophthalmology*. 2001;108(1):12-20.

An eleven-year-old girl is referred to an ophthalmologist by pediatrician because of spots on her body. The referral note states that there are five 16 mm and one 27 mm brown spots on her body. Her older sister also has many similar spots on her body. Which of the following would be expected to be revealed by an eye examination in this patient?

- A) Optic neuritis
- B) Cataract
- C) Chorioretinal lacunae
- D) Retinal hemorrhage
- E) Lisch nodule

Correct Answer:

- E) Lisch nodule

Explanation:

The presence of multiple café-au-lait spots (brown spots) on the skin, particularly if there are more than six that are larger than 5 mm in prepubertal individuals or larger than 15 mm in postpubertal individuals, is a key diagnostic criterion for **Neurofibromatosis Type 1 (NF1)**. Given the family history and the patient's presentation, it is highly suggestive of NF1.

Scientific Explanation:

- **Lisch nodules (E)**: These are melanocytic hamartomas that appear as well-defined, dome-shaped elevations on the surface of the iris and are a common ocular manifestation of NF1. They are typically asymptomatic but can be identified during a slit-lamp examination by an ophthalmologist.
- **Optic neuritis (A)**, **Cataract (B)**, **Chorioretinal lacunae (C)**, and **Retinal hemorrhage (D)** are not commonly associated with NF1 and are therefore less likely findings in this patient based on the information provided.

References:

1. Korf BR. Neurofibromatosis. *Handb Clin Neurol*. 2013;111:333-340. doi: 10.1016/B978-0-444-52891-9.00034-2.
2. Friedman JM. Neurofibromatosis 1. *GeneReviews*. 1998 Dec 18 [updated 2020 Sep 17].
3. Tongsgard JH. Clinical manifestations and management of neurofibromatosis type 1. *Semin Pediatr Neurol*. 2006 Sep;13(3):119-127. doi: 10.1016/j.spen.2006.06.008.



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- A) Optic neuritis
- B) Cataract
- C) Chorioretinal lacunae
- D) Retinal hemorrhage
- E) Lisch nodule

****E) Lisch nodule****

Explanation:

The presence of multiple café-au-lait spots (brown spots) in a child, especially with a family history, is highly suggestive of neurofibromatosis type 1 (NF1). Lisch nodules are iris hamartomas (benign tumors) that are characteristic of NF1. Therefore, an eye examination in this patient would likely reveal Lisch nodules.

References:

1. Gutmann DH, Ayduz B, Korf BR, et al. Neurofibromatosis type 1. *Nat Rev Dis Primers*. 2017;3:17043.
2. Plotkin SR, Friedman JM, Lee KE. Neurofibromatosis type 1. *Lancet*. 2008;371(9611):703-714.
3. Riccardi VM, Eichner JE, Stout JT, et al. Neurofibromatosis: phenotype, natural history, and pathogenesis. *J Pediatr*. 1988;113(4):348-359.

Example of Turkish MSE-like question answered wrongly by chatbots



A 45-year-old male patient is evaluated in the emergency room after a traffic accident. When a light source is shined on the left eye of a patient, miosis is observed only in the right eye. Which of the following is the lesion location in this patient?

- A) Left nervus opticus
- B) Right nervus opticus
- C) Right nervus oculomotorius
- D) Left nervus oculomotorius
- E) Right tractus opticus

Correct Answer:

C) Right nervus oculomotorius

Explanation:

Miosis (pupillary constriction) in the right eye when light is shined on the left eye suggests that the efferent pathway (parasympathetic fibers running with the oculomotor nerve) controlling the right pupil is intact, but there may be a lesion affecting the efferent pathway to the right pupil specifically. This indicates a possible lesion in the right oculomotor nerve (cranial nerve III).

****Scientific Explanation:****

- ****Right nervus oculomotorius (C)****: The oculomotor nerve controls the constriction of the pupil via the parasympathetic fibers. A lesion in the right oculomotor nerve would impair the direct light reflex in the right eye (no miosis when light is shined on the right eye) but could still allow for miosis in the right eye when light is shined on the left eye if the left optic nerve and the right oculomotor pathway are intact.

****Other options****:

- ****Left optic nerve (A)****: A lesion here would affect the afferent pathway and could prevent the consensual light reflex, but it wouldn't selectively cause miosis in the right eye when light is shined on the left eye.

- ****Right optic nerve (B)****: This would affect the afferent pathway for the right eye, not explaining the specific miosis in the right eye when light is shined on the left eye.

- ****Left nervus oculomotorius (D)****: This would affect the left pupil's response and would not explain the specific findings in the right eye.

- ****Right tractus opticus (E)****: A lesion here would affect the crossing fibers and potentially lead to visual field defects, but it wouldn't specifically cause the described pupillary response.

References:

1. Brazis PW, Masdeu JC, Biller J. ****Localization in Clinical Neurology****. 7th ed. Wolters Kluwer; 2016.
2. Ropper AH, Samuels MA, Klein JP. ****Adams and Victor's Principles of Neurology****. 10th ed. McGraw-Hill Education; 2014.
3. Liu GT, Volpe NJ, Galetta SL. ****Neuro-Ophthalmology: Diagnosis and Management****. 2nd ed. Saunders; 2010.



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- A) Left nervus opticus
- B) Right nervus opticus
- C) Right nervus oculomotorius
- D) Left nervus oculomotorius
- E) Right tractus opticus

The correct answer is ****A) Left nervus opticus****.

****Explanation:****

The patient's clinical presentation describes an intact direct light reflex in the right eye (pupillary constriction when light is shone directly into the right eye) and an absent consensual light reflex in the right eye (no pupillary constriction when light is shone into the left eye). This indicates a problem with the afferent (sensory) pathway of the pupillary light reflex in the left eye.

The afferent pathway of the pupillary light reflex begins with the retinal ganglion cells in the left eye, which transmit the light signal through the left optic nerve to the pretectal nucleus in the midbrain. The pretectal nucleus then projects bilaterally to the Edinger-Westphal nuclei, which send parasympathetic fibers via the oculomotor nerves (CN III) to both iris sphincter muscles, causing pupillary constriction.

Therefore, a lesion in the left optic nerve would disrupt the transmission of the light signal from the left eye, resulting in the observed pattern of an intact direct light reflex in the right eye but an absent consensual light reflex in the right eye.

****Scientific References:****

1. ****Wilhelm H.**** Disorders of pupillary function: Afferent pupillary defect. *Handb Clin Neurol.* 2011;102:57-67. doi: 10.1016/B978-0-444-52901-5.00005-3. PMID: 21827923.

* This chapter provides a comprehensive overview of pupillary light reflex disorders, including the afferent pupillary defect, and discusses their clinical significance and localization.

2. ****Bell RA, Waggoner PM.**** Relative afferent pupillary defect in the diagnosis of optic nerve disease. *Am J Ophthalmol.* 1980 Jan;89(1):26-30. doi: 10.1016/0002-9394(80)90125-7. PMID: 7351439.

* This classic article discusses the clinical utility of the relative afferent pupillary defect (RAPD) in diagnosing optic nerve lesions and differentiating them from other causes of visual loss.

3. ****Roy FH.**** *Ocular Syndromes and Systemic Diseases.* 5th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.

* This textbook provides detailed information about the pupillary light reflex pathway and the clinical manifestations of lesions affecting different parts of the pathway.

Example of Turkish MSE-like question answered correctly by chatbots after feedback



A 45-year-old male patient is evaluated in the emergency room after a traffic accident. When a light source is shined on the left eye of a patient, miosis is observed only in the right eye. Which of the following is the lesion location in this patient?

- A) Left nervus opticus
- B) Right nervus opticus
- C) Right nervus oculomotorius
- D) Left nervus oculomotorius
- E) Right tractus opticus

Correct Answer:

D) Left nervus oculomotorius

Explanation:

In a patient who only has miosis in the right eye when light is shined on the left eye, the lesion is most likely located in the left oculomotor nerve (Cranial Nerve III).

****Scientific Explanation:****

- ****Left nervus oculomotorius (D)****: The oculomotor nerve is responsible for the efferent pathway of the pupillary light reflex. If there is a lesion in the left oculomotor nerve, the direct light reflex in the left eye (when light is shined on the left eye) will be absent, but the consensual light reflex (constriction of the right pupil when light is shined on the left eye) will still be present if the right oculomotor nerve is intact. This explains why only the right eye has miosis when light is shined on the left eye.

****Other options****:

- ****Left optic nerve (A)****: A lesion here would affect the afferent pathway and prevent both direct and consensual responses when light is shined on the left eye.

- ****Right optic nerve (B)****: A lesion here would not explain the lack of direct response in the right eye when light is shined on the left eye.

- ****Right nervus oculomotorius (C)****: This would affect the right eye's response but would not explain the described findings of miosis in the right eye when light is shined on the left eye.

- ****Right tractus opticus (E)****: A lesion here would likely affect both visual fields and cause visual field defects but would not specifically cause the described pupillary response.

References:

1. Brazis PW, Masdeu JC, Biller J. ****Localization in Clinical Neurology****. 7th ed. Wolters Kluwer; 2016.
2. Ropper AH, Samuels MA, Klein JP. ****Adams and Victor's Principles of Neurology****. 10th ed. McGraw-Hill Education; 2014.
3. Liu GT, Volpe NJ, Galetta SL. ****Neuro-Ophthalmology: Diagnosis and Management****. 2nd ed. Saunders; 2010.

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- C) Right nervus oculomotorius
- D) Left nervus oculomotorius
- E) Right tractus opticus

The correct answer is ****D) Left nervus oculomotorius****.

****Explanation:****

The pupillary light reflex is a complex neurological pathway that involves both sensory (afferent) and motor (efferent) components.

****Afferent pathway:**** Light enters the eye and is sensed by the retina. This signal travels through the optic nerve to the brain, specifically to the pretectal nucleus in the midbrain.

****Efferent pathway:**** The pretectal nucleus sends signals to the Edinger-Westphal nuclei (EWN) on both sides of the brainstem. The EWN then send parasympathetic fibers via the oculomotor nerve (CN III) to the ciliary ganglion. From there, short ciliary nerves innervate the sphincter pupillae muscle, causing constriction of the pupil.

In this scenario:

****Miosis in the right eye when light is shone on the left eye:**** This indicates that the efferent pathway (from the brain to the muscles controlling the pupil) in right side is not effected.

****No miosis in the left eye:**** This suggests a problem with the efferent pathway on the left side.

Therefore, the lesion must be located in the ****left nervus oculomotorius****.

****Scientific References:****

1. ****Wilhelm H.**** Disorders of pupillary function: Afferent pupillary defect. Handb Clin Neurol. 2011;102:57-67. doi: 10.1016/B978-0-444-52901-5.00005-3. PMID: 21827923.
2. ****Bell RA, Waggoner PM.**** Relative afferent pupillary defect in the diagnosis of optic nerve disease. Am J Ophthalmol. 1980 Jan;89(1):26-30. doi: 10.1016/0002-9394(80)90125-7. PMID: 7351439.
3. ****Miller NR, Newman NJ, Biousse V, Kerrison JB.**** _Walsh and Hoyt's Clinical Neuro-Ophthalmology_. 7th ed. Philadelphia, PA: Elsevier; 2017.