

# Choroidal Metastasis of the Mucinous Rectal Adenocarcinoma

Musa Yigit<sup>1,\*</sup>, Levent Tok<sup>2</sup>, Ozlem Yalcin Tok<sup>2</sup>

<sup>1</sup>Ophthalmology Clinic, Isparta Şehir Hospital, Isparta, Turkey

<sup>2</sup>Ophthalmology Clinic, Süleyman Demirel University, Isparta, Turkey

## Email address:

myigit15@gmail.com (M. Yigit), dr.leventtok@yahoo.com (L. Tok), esattok@yahoo.com (O. Y. Tok)

\*Corresponding author

## To cite this article:

Musa Yigit, Levent Tok, Ozlem Yalcin Tok. Choroidal Metastasis of the Mucinous Rectal Adenocarcinoma. *International Journal of Medical Case Reports*. Vol. 1, No. 3, 2022, pp. 25-28. doi: 10.11648/j.ijmcr.20220103.14

Received: May 7, 2022; Accepted: June 25, 2022; Published: July 20, 2022

**Abstract:** Our purpose was to evaluate the uveal metastasis causing progressive vision loss in the advanced rectal cancer. In our case, 34 years old male patient has consulted to our clinic by medical oncology department because of right blurred vision. He was primary mucinous rectum cancer patient and also has lung and vertebral metastasis. The most common intraocular malignant tumors are uveal metastasis. Especially in severe and advanced cancer patients, there may be seen some metastasis and approximately 10% of these metastasis can be seen in choroid. On the other hand, first sign of a metastatic primary tumor can be an uveal metastasis, that's why it is important to research for primary origin. Extraocular malignant cancers may metastate intraocular, but this event is rare. Intraocular metastasis can be seen in the uveal tract, mostly in the choroid and they are the most common type of intraocular malignancies. Choroidal metastasis is seen like a creamy white or pale yellow mass associated with subretinal fluid. The most common primary origins are breast cancer in female and lung cancer in male patients. They can be diagnose by ultrasonography (USG) and optical coherence tomography (OCT). Intraocular biopsy is useful in patients with clinical suspicion of uveal metastasis but no evidence of primary malignancy despite systemic evaluation. If systemic treatment is not enough to suppress the ocular tumor, local therapies such as external beam radiation therapy (EBRT), photodynamic therapy (PDT), and transpupillary thermotherapy (TPT) may be tried. Unfortunately, the survival rate of these patients is low after diagnosis.

**Keywords:** Choroidal Metastasis, Rectum Carcinoma, Vision Loss

## 1. Introduction

The retina is an active tissue, metabolically, consuming high levels of oxygen and nutrients. Ocular vascular system should work systematically and well-organized for ensuring the visual function. Blood vessels growth in the eye may be affected by the pathological conditions [18].

A healthy choroidal vasculature is necessary to support the retinal pigment epithelium (RPE) and photoreceptors, because there is a mutualistic symbiotic relationship between the components of the photoreceptor/retinal pigment epithelium (RPE)/Bruch's membrane (BrMb)/choriocapillaris (CC) complex. If this relationship is broken down, the choroidal vasculature structure can not work stable. The choriocapillaris is the lobular, fenestrated capillary system of choroid. It lies immediately posterior to the pentalaminar Bruch's membrane

(BrMb). The blood supply for this system is the intermediate blood vessels of Sattler's layer and the large blood vessels in Haller's layer. The death and dysfunction of CC and photoreceptors appear to be secondary events to loss in RPE. Reduction in blood supply to the CC, often stenosis of intermediate and large blood vessels, is associated with CC loss. In addition, the environment of the CC, basement membrane and intercapillary septa, is a proinflammatory milieu with accumulation of proinflammatory molecules like CRP and complement components. The loss of CC might be a stimulus for drusen formation since the disposal system for retinal debris and exocytosed material from RPE would be limited. Therefore, loss of this functionally integrated relationship results in death and dysfunction of all of the components in the complex [20].

On the other hand, optical coherence tomography

angiography (OCTA) is a noninvasive method of 3D imaging of the retinal and choroidal circulations. However, vascular depth discrimination is limited by superficial vessels projecting flow signal artifact onto deeper layers. The projection-resolved (PR) OCTA algorithm improves depth resolution by removing projection artifact while retaining in-situ flow signal from real blood vessels in deeper layers. The vascular pattern in retinal plexuses and interconnecting layers are consistent with previous histologic studies. Therefore, an improved system of nomenclature and segmentation boundaries for detailed 3-dimensional retinal vascular anatomy by OCTA can be seen [19].

Metastatic tumors are the most common intraocular malignancy, representing to the choroid the most common site of intraocular metastasis due to its high vascularity. The incidence of gastrointestinal tumors is less than breast, prostate and lung cancer. The most common extraocular metastasis of colorectal cancers are regional lymph nodes, liver, lungs and bones; respectively.

Uveal metastasis is a poor prognostic factor. After diagnosis of uveal metastasis the survival rate of these patients is low approximately eight-nine months; this rate depends on the type of primary tumor [1-5].

Uveal metastasis by carcinomas are frequent, but on the other hand by sarcomas and melanomas are rare. The most frequent source of choroidal metastasis is breast cancer in women and lung cancer in men [6-8].

The prevalence of uveal metastasis is approximately 2.3-9%. After diagnosis, 67-88% other extraocular metastasis have reported; the most frequently metastasis are lung (%20-50), bone (%14-57), and liver (%5-17) [2, 3].

Our case-report is ocular metastasis of the colorectal cancer, which is first in literature.

## 2. Case

34 years old male patient has consulted to our clinic by medical oncology because of right blurred vision for 3 days. We learnt from patient-file examination that he was primary mucinous rectum cancer and has lung and vertebral metastasis.

At first clinical examination on same day, although right and left visual acuity was 100%, there was blurred vision on right eye and deformity at amsler grid test. Grade 2 hypertensive retinopathy (htrp) was there at bifundoscopic examination. Elevated choroidal lesion at moderate internal reflectivity is seen by right B-mode orbital ultrasonography. There was no significant sign except scleral thickness at orbita computerized-tomography (CT).

## 3. Results

Primary colorectal squamous cell carcinoma is an extremely rare neoplasm, incidence of the carcinoma is 0.1 to 0.25 per 1,000 diagnosed colorectal carcinomas. Colorectal Squamous Cell Carcinoma has an aggressive and severe behavior. Standard of treatment for the colon tumors is surgery. chemoradiotherapy is a promising method especially

for rectal tumors treatment. Further clinical trials are necessary to determine the preferred treatment approach [12].

Squamous cell carcinoma (SCC) of the rectum is a unique entity that lacks definitive guidelines regarding prognosis and treatment.

Treatment of rectal squamous cell carcinoma is generally like anal cancers with definitive chemoradiation, with similar survival to historical reports of anal cancer. Anal cancers of the rectum is most commonly treated under the rectal cancer treatment protocol [13].

Colorectal cancer (CRC) is the third most frequent cancer in the world and it is the second cause of death of neoplastic origin. Synchronism in colorectal cancer is approximately 3-6%. The gastrointestinal tract is the most frequent place where neuroendocrine neoplasms (NNE) emerge however fortunately a special type of these neuroendocrine carcinomas (CNE) are seen rarely. Due to the severeness and aggressiveness of the malignancy, treatment can be differentiate. Therefore a multidisciplinary management and approach are needed, however, in most cases the result is not the best [14].

The choroid has abundant vascular supply, because of this situation choroid is the most common ocular part for metastatic disease. Choroidal metastasis represents the most common type of intraocular malignancy and frequently involves the posterior uveal tract. The majority of patients diagnosed with uveal metastasis have additional metastatic manifestations elsewhere, so re-staging before treatment is recommended. Early diagnosis and suddenly starting to the treatment are mandatory for vision-threatening situations to be able to reserve visual acuity. Overall survival of patients with uveal metastasis is low, and unfortunately average survival period is six to twelve months [16]. The primary cancers that most commonly lead to choroidal metastases include breast cancer (40-47%) and lung cancer (21-29%). Ocular involvement is often bilateral and multifocal which is secondary to breast cancer. However, unilateral and unifocal metastasis are more commonly secondary to lung cancer. The treatment of choroidal metastasis depends on the systemic status of the patient and number, location, and laterality of the choroidal tumors. Treatment protocols may differ according to the situation of the patient and disease, protocol alternatives include observation in patients with poor systemic status or those with resolved or asymptomatic disease; systemic chemotherapy, immunotherapy, hormone therapy, or whole eye radiotherapy if the metastases are active, multifocal and bilateral; plaque radiotherapy, transpupillary radiotherapy, or photodynamic therapy for active, solitary metastasis; and then unfortunately enucleation for unbearable pain and blind eye [15].

Fundoscopy, ultrasonography, and fluorescein angiography are now complemented by indocyanine green angiography and optical coherence tomography. On the other hand, choroidal tumor biopsy may also confirm the metastatic nature of the tumor and can help to determine the site of the primary malignancy. Most patients' life expectancy is very low and for these patients heavy and complex treatments are generally not recommended.

However, recent advances in systemic therapy have significantly improved survival of certain patients who may benefit from an aggressive ocular approach that could preserve visual acuity. Although external beam radiation therapy is the most widely used treatment, more advanced forms of radiotherapy that are associated with fewer side effects can be proposed in some cases. In patients with a shorter life expectancy, systemic therapies such as those targeting oncogenic drivers, or immunotherapy can induce a regression of the choroidal metastases, and may be sufficient to temporarily decrease visual symptoms. However, sometimes they may emerge resistance to systemic treatment and ocular relapse usually requires radiotherapy for durable control. Less invasive office-based treatments, such as photodynamic therapy and intravitreal injection of anti-VEGF, may also help to preserve visual acuity while reducing time spent in medical settings for patients in palliative care [17].

#### 4. Conclusion

The most common intraocular malignant tumors are uveal metastasis. Choroidal metastasis are seen approximately 10% of patients who have systemic metastasis. Uveal metastasis can be the first sign of metastatic primary tumor, that's why it is important to research for primary origin [1-3].

Extraocular malignant cancers metastasize frequently extraocular, but rarely intraocular [1, 2].

The most common metastasis to uvea are by breast and lung cancer [1, 2, 10].

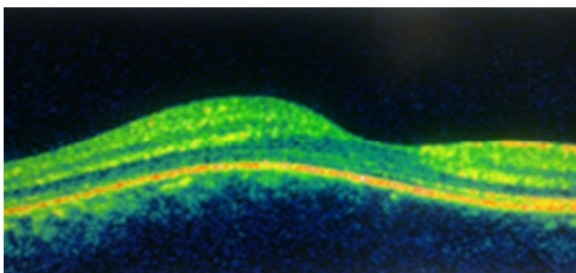
Uveal metastasis are generally unilateral, approximately 75% and seems like solitary heterogen pigmented lesions. Their differential diagnosis is uveal melanoma, but it is difficult to differentiate each other [1-3, 10].

Choroid is the most common metastatic part of uvea [1].

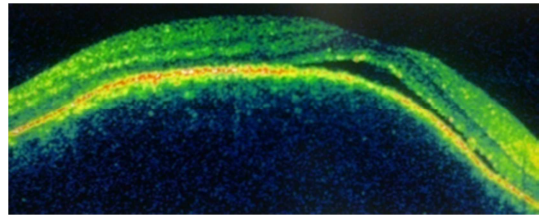
Most frequently painless vision loss is seen and accompanied with serous retinal detachment. Treatment and control planning depends on the patient.

Close follow-up to small tumors which have unaffected visual acuity and respond to systemic treatment. The best treatment alternative is external beam radiotherapy (EBRT) for saving the eye and stabilising the visual acuity in large and symptomatic tumors [9, 11]. Bevacizumab, a strong anti-VEGF monoclonal antibody, has tried in choroidal metastasis and results are promising.

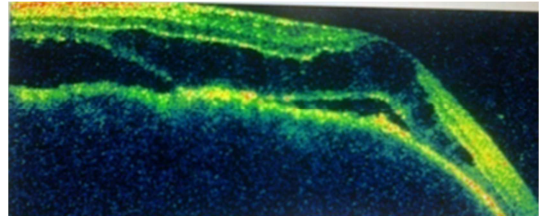
Our patient is the only choroidal metastasis by primary mucinous rectal adenocarcinoma in the literature.



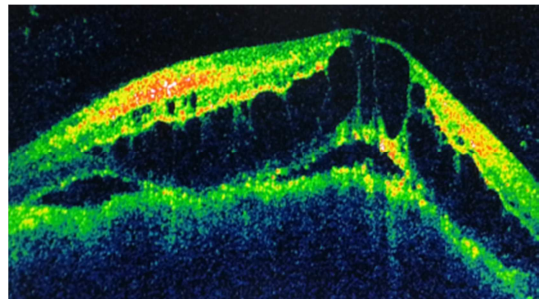
*Figure 1. Right eye OCT-first examination day.*



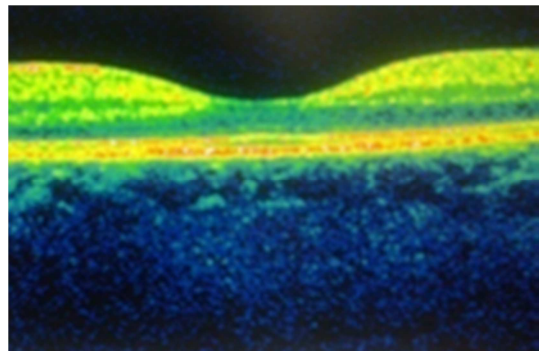
*Figure 2. Right eye OCT-thirteenth week.*



*Figure 3. Right eye OCT-second month.*



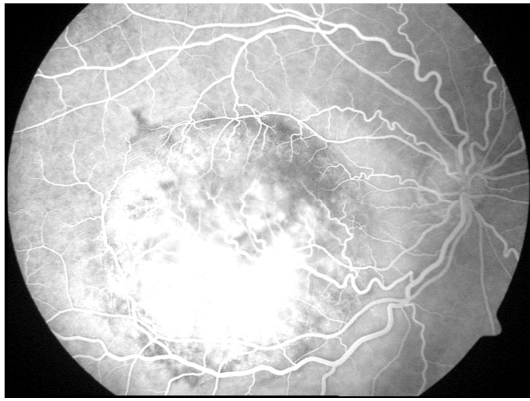
*Figure 4. Right eye OCT-thirtieth month.*



*Figure 5. Left eye OCT.*



*Figure 6. Right eye fundus photo.*



**Figure 7.** Right eye FFA.



**Figure 8.** Right eye FFA.

## References

- [1] Shields JA, Shields CL.: Metastatic tumors to the intraocular structures. Intraocular tumors: A text and atlas. Philadelphia: WB Saunders, 1992: 207-238.
- [2] Shields CL, Shields JA, Gross NE, Schwartz G, Lally S.: Survey of 520 uveal metastases. *Ophthalmology* 1997; 104: 1265-1276.
- [3] Kanthan GL, Jayamahan J, Yip D, Conway RM.: Management of metastatic carcinoma of the uveal tract an evidence-based analysis. *Clin Experiment Ophthalmol* 2007; 35: 553-565.
- [4] Soysal HG.: Metastatic tumors of the uvea in 38 eyes. *Can J Ophthalmol* 2007; 42: 832-835.
- [5] Demirci H, Shields CL, Chao AN, Shields JA.: Uveal metastasis from breast cancer in 264 patients. *Am J Ophthalmol* 2003; 136: 264-271.
- [6] Harbour JW, de Potter P, Shields CL, Shields JA.: Uveal metastasis from carcinoid tumor. Clinical Observations in nine cases. *Ophthalmology* 1994; 101: 1084-1020.
- [7] Wiegel T, Krensel KM, Bornfold N, Bottke D, Stange, Foerster MH, Hinkelbein W.: Frequency of asymptomatic choroidal metastasis in patients with disseminated breast cancer: results of a prospective screening programme, *Br J Ophthalmol* 1998; 82: 1159-1161.
- [8] Mewis L, Young SE.: Breast carcinoma metastatic to the choroid-analysis of 67 patients *Ophthalmology* 1982; 89: 147-151.
- [9] Shields CL.: Plaque radiotherapy for the management of uveal metastasis. *Curr Opin Ophthalmol* 1998; 9: 31-37.
- [10] Konstantinidis L., Damato B.: Intraocular metastasis- A Review. *Asia Pac J Ophthalmol* 2017 Mar-Apr, 6 (2): 208-214.
- [11] Giulari GP, Sadaka A.: Uveal metastatic disease: current and new treatment options (review). *Oncol Rep.* 2012 Mar; 27 (3): 603-7. doi: 10.3892/or2011.1563. Epub 2011 Nov 28.
- [12] Schizas D, Katsaros I, Mastoraki A, Karela NR, Zampetaki D, Lazaridis II, Tsapralis D, Theodoropoulos GE. *J Invest Surg.* 2022 Jan; 35 (1): 151-156. doi: 10.1080/08941939.2020.1824044. Epub 2020 Oct 6.
- [13] Malakhov N, Kim JK, Adedoyin P, Albert A, Schreiber D, Lee A. *J Gastrointest Cancer.* 2022 Mar; 53 (1): 105-112. doi: 10.1007/s12029-020-00552-3. Epub 2020 Nov 19.
- [14] Gonzáles Yovera JG, Vargas Marcacuzco HT, Santos Julian RE, Arenas Gamio JL. *Rev Gastroenterol Peru.* 2020 Oct-Dec; 40 (4): 361-365.
- [15] Arepalli S, Kaliki S, Shields CL. (2015 Feb.) *Indian J Ophthalmol.* 63 (2): 122-7. doi: 10.4103/0301-4738.154380.
- [16] Jegerlehner S, Rothenbuehler SP, Pabst T. *Praxis (Bern 1994).* (2014 May 21); 103 (11): 641-7. doi: 10.1024/1661-8157/a001671.
- [17] Mathis T, Jardel P, Loria O, Delaunay B, Nguyen AM, Lanza F, Mosci C, Caujolle JP, Kodjikian L, Thariat J. *Prog Retin Eye Res.* 2019 Jan; 68: 144-176. doi: 10.1016/j.preteyeres.2018.09.003. Epub 2018 Sep 19.
- [18] Sun Y, Smith LEH. (2018 Sep 15) *Annu Rev Vis Sci.*; 4: 101-122. doi: 10.1146/annurev-vision-091517-034018.
- [19] Campbell JP, Zhang M, Hwang TS, Bailey ST, Wilson DJ, Jia Y, Huang D. (2017 Feb 10) *Sci Rep.*; 7: 42201. doi: 10.1038/srep42201.
- [20] Edwards M, Luty GA. (2021) *Adv Exp Med Biol.*; 1256: 89-119. doi: 10.1007/978-3-030-66014-7\_4.