Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Monocular visual loss in a disseminated colorectal malignancy—A case report of a rare skull base metastasis ☆

Ahmed T. Abdelhamid, MBChB[a,b,*], *Tarek A. Khater, MBChB*[a,b]

[a] *St.Helens and Knowley NHS Foundation Trust, Warrington Rd, Rainhill, Prescot L35 5DR, UK*
[b] *York Teaching Hospital, York, UK*

ARTICLE INFO

Article history:
Received 21 August 2022
Accepted 27 September 2022
Available online 27 October 2022

Keywords:
Skull base metastases
Colorectal malignancy
Secondary orbital tumors
Optic canal
Visual loss
Cancer

ABSTRACT

Neoplasms of the orbit may be primary, secondary (infiltration from the adjacent structures), or metastatic (from distant structures). It can be divided into 3 histologic categories: benign, benign but locally aggressive, and malignant. Primary and secondary orbital tumors, including intra-orbital and optic nerve tumors are uncommon observations in daily medical practice. Orbital tumors represent approximately 0.1% of all tumors and approximately 18% of all orbital diseases.

We report a case of a 42 year old male patient with colorectal malignancy with basal skull metastasis involving the orbital apex and involving the optic nerve causing visual loss.

Case presentation

A 42-year-old male patient presented to the primary care unit with right sided abdominal pain started 12 months ago. Pain described as dull in nature affecting right hypochondrial region and radiating to groin and axilla, not associated with change to bowel habits, nausea or vomiting. He has a recent history of significant weight loss but no other systemic symptoms. He has no past medical history and takes no regular medications. He had a previous history of incidental finding of appendiceal thickening on a CT abdomen done 5 years ago for which a follow-up CT scan was arranged but patient failed to attend. He had a significant smoking history and illicit drugs which he stopped 4 years ago.

On examination, his temperature was 37.1, pulse rate 66 beats per minute, saturation 98% on room air, blood pressure was 130/70, and respiratory rate 18.

General physical examination showed no Pallor, jaundice, cyanosis, finger clubbing or lymphadenopathy.

His abdomen was soft all over with minimal tenderness on deep palpation of Right iliac fossa. No masses, hepatosplenomegaly or lymphadenopathy detected on examination. CT KUB was requested in view of right-sided abdominal pain radiating to the groin.

His bloods showed iron deficiency anemia and slightly raised GGT and normal renal functions.

☆ Competing Interests: We have no conflicts of interest to disclose.

* Corresponding author.
E-mail addresses: a.t.hamid@doctors.org.uk (A.T. Abdelhamid), Tarek.Khater@nhs.net (T.A. Khater).

https://doi.org/10.1016/j.radcr.2022.09.092

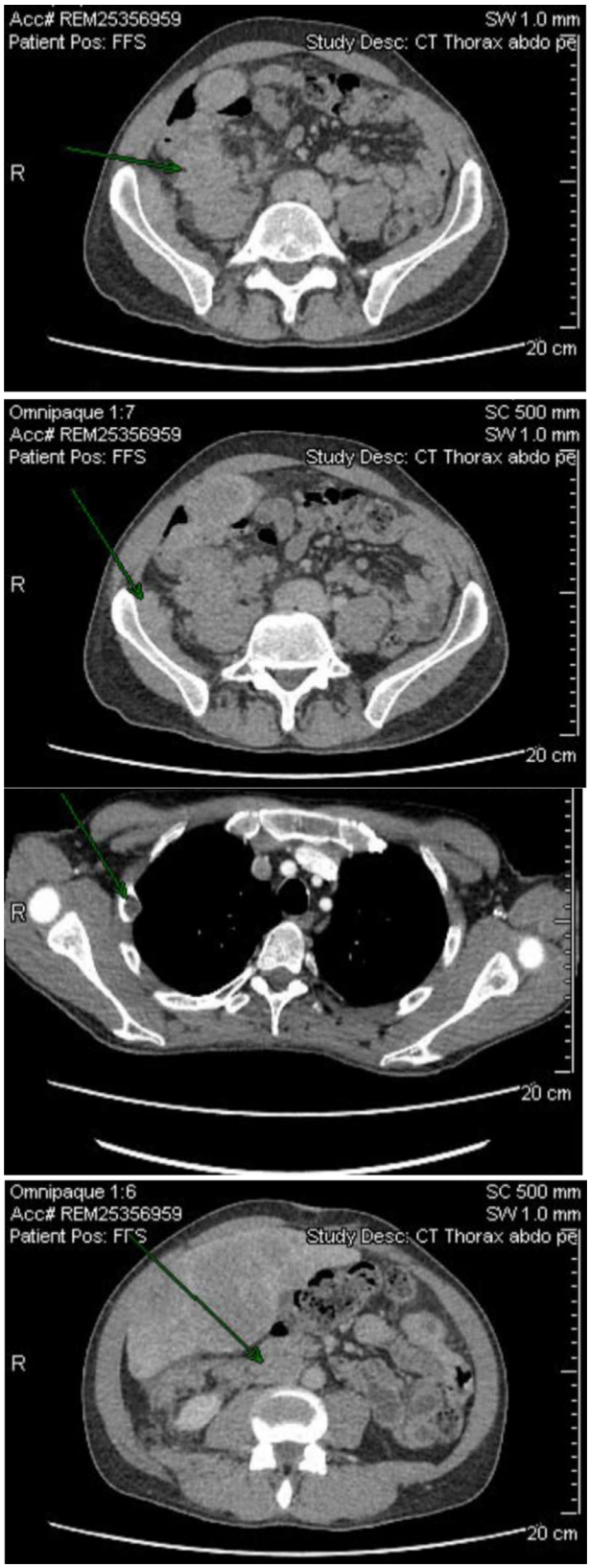

Fig. 1 – CT thorax abdomen and pelvis showing colorectal malignancy with metastases to liver, lung and third rib—mass measuring 9 cm in maximum diameter with retroperitoneal soft tissue extension invading IVC, Psoas muscle and Gerota's fascia.

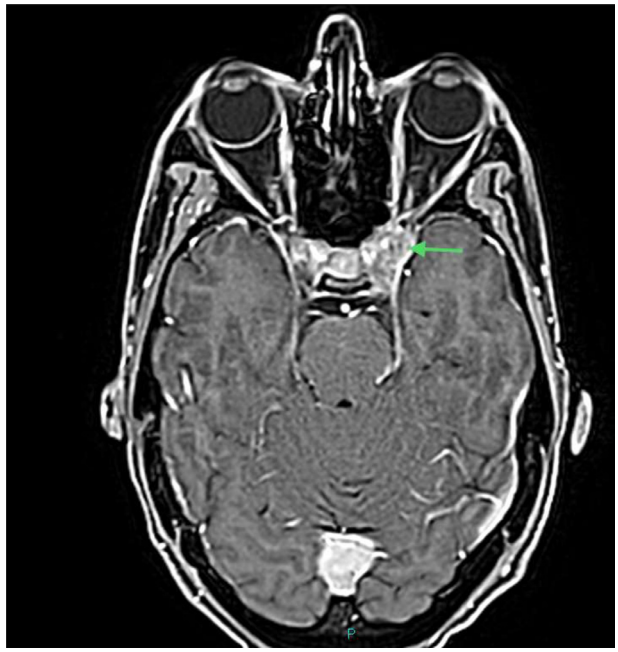

Fig. 2 – MRI head with contrast showing left-sided cavernous sinus mass invading the left orbital apex in contact with the optic nerve.

CT KUB showed large volume soft tissues mass in right lower abdomen originating from right lower renal pole with multiple low-density liver lesions representing metastases—largest 7.5 cm in diameter and multiple cannon ball metastases in lower lungs largest 2.2 cm in diameter.

Images were reviewed in urology MDT and due to the limitations of the unenhanced scan, the origin of the lesion was not confirmed and hence, CT thorax abdomen and pelvis with contrast was done showing a large soft tissues mass within the peritoneum extending along the entire right side of the right lower abdomen and disseminated pulmonary, hepatic and hilar metastases (Fig. 1)

Liver biopsy was performed and it showed a poorly differentiated adenocarcinoma in keeping with colorectal origin of the malignant lesion. The patient was subsequently referred to oncology to start chemotherapy.

Laboratory results prior to initiation of chemotherapy showed CEA 19 ug/L, gamma GT 1166 U/L, ALP 593 U/L, and total bilirubin of 55 umol/L.

His condition deteriorated significantly and he then presented with worsening headaches and visual loss affecting left eye. His visual loss was gradual yet significant reaching only light perception 2 months following diagnosis. MRI head performed and it showed left cavernous sinus mass extending into left orbital apex in contact with the optic nerve with some degree of proptosis (Fig. 2) and another one arising from the right lateral mass of C1 with lateral compression of right jugular vein (Fig. 3)

Discussion

Metastatic orbital lesions accounting for 10% of all orbital tumors of which only 8% is originated from the optic nerve [1,2].

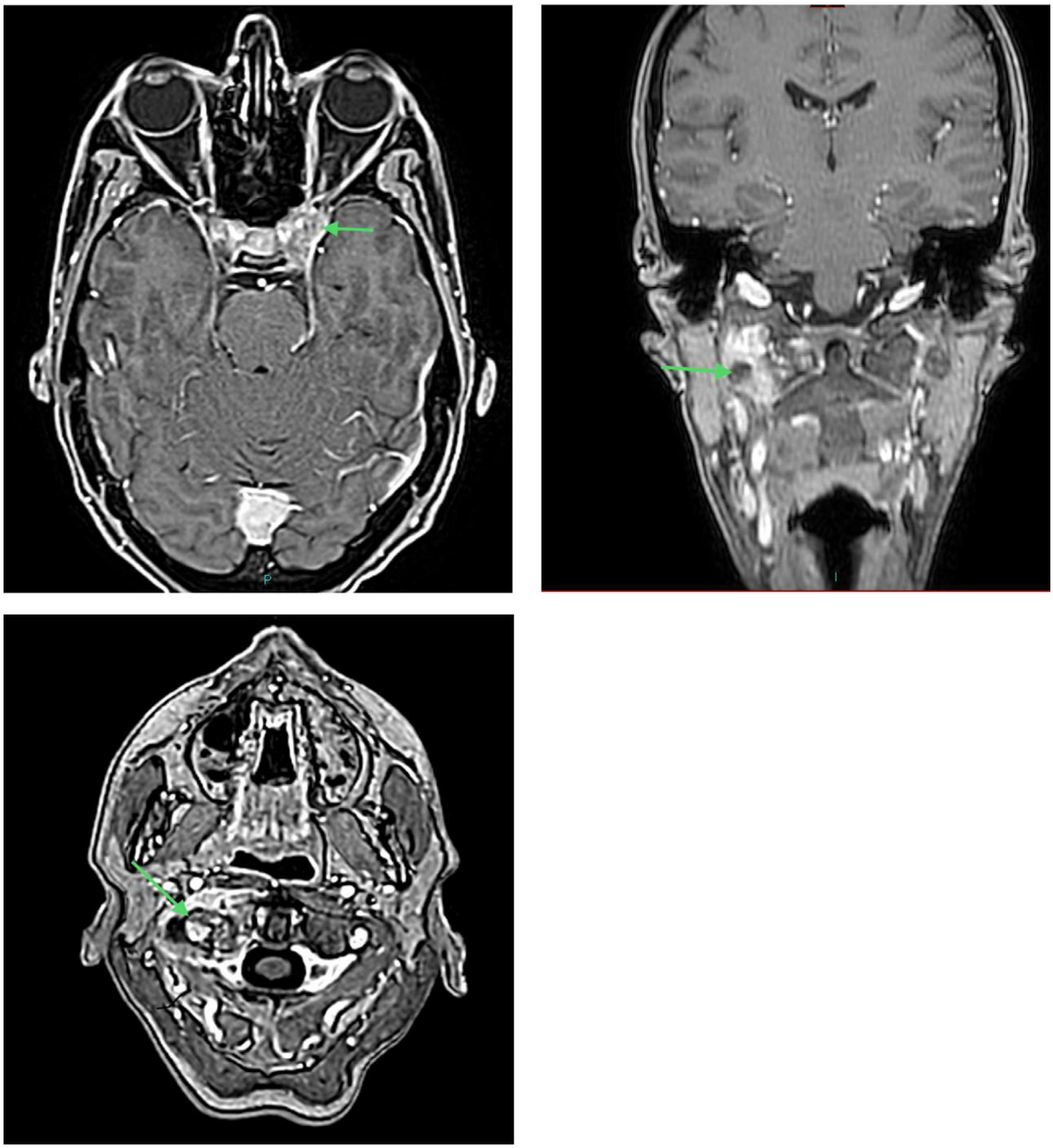

Fig. 3 – MRI head with contrast showing metastatic lesion arising from right lateral C1 causing compression of the right jugular vein.

Various classification schemes have been used to classify and describe orbital tumors, based on tumor location, histology, demographics, imaging characteristics, clinical behavior, and histologic behavior. On the other hand, colorectal cancer (cancer of the colon or rectum, or bowel cancer) is the fourth most common cancer in the UK [3]. Around 20% of patients with CRC have distant metastases at the time of diagnosis with an involvement of the liver, lungs, peritoneum, or bone. Orbital metastasis from colorectal cancer is rare with only a handful of cases were documented in the literature [1].

Approximately 20% of colorectal cancer patients have distant metastases at presentation, and 30% develop metastases during their course of the disease [4]. Therefore, most orbital metastases present in patients with an established diagnosis of cancer, along with widespread systemic involvement. Metastatic spread is the most common form of orbital neoplasm and the most common primary sources for orbital metastasis include breast, lung, prostate cancers and melanomas [5]. The pathophysiology of metastases is still not well understood. Theoretically, rectal cancer has easier access to the orbit compared to colon cancer. The suggested narrative is the rectal cancer developing tumor emboli traveling through the portal venous drainage (the middle and inferior hemorrhoidal veins) to the inferior vena cava, then via the cardiac chambers to the carotid arteries, and later into the ophthalmic artery. Therefore, as a result, pulmonary metastases

are fairly common. Alternatively, the malignant seed could potentially travel via Batson's venous plexus and reaches the cavernous venous sinuses leading up to the ophthalmic venous drainage in which case vertebral metastasis would be more prevalent [6].The manifestations of orbital metastases typically include diplopia (48%), proptosis (26%), pain (19%), decreased visual acuity (16%), ptosis (10%), or mass [2].There are very few cases in the literature review showing orbital metastasis from a GI primary malignancy [7].

Our patient had evidence of bony metastasis on CT with a number of osseous lesions involving only the cervical spine and the skull bone. To our knowledge, he's likely to have had a tumor embolus from the rectum reach the orbit, metastasizing along the way.

In the literature, the most frequent primary tumors that account for orbital malignancies are breast (36.3%), melanoma (10.1%), and prostate (8.5%) cancers, with median time interval of 12 months. Most metastases showed a diffuse location within the orbit (19%), with preferential infiltration of orbital soft tissues (40.2%). In 47 cases (5.4%), tumors extended intracranially [8].

Orbital metastases from colorectal cancer portend a poor prognosis as all cases reporting survival died less than 1 year after detection of orbital involvement. This is, arguably, due to the late presentation which is also substantiated by the scant evidence of visual symptoms as the first presentation in the literature review. Accordingly, the limited survival is likely the result of widely metastatic disease by the time orbital metastases are detected. Management often includes palliative radiation for local symptom control and systemic chemotherapy [9]. With more such cases being reported in the literature, we aim to gain a better understanding of the course of the disease and hopefully reach a more efficient management for early detection.

Conclusion

There is a statistically uncommon presentation of a rare form of metastatic disease as depicted by our case report. It is important to obtain a detailed history, perform a thorough physical exam, and consider further diagnostic imaging if deemed necessary. It is also extremely important to establish the diagnosis early to allow initiation of chemotherapy and radiation therapy as soon as possible to improve the quality of life including restoration of the visual acuity.

Patient consent

Obtained from patient.

REFERENCES

[1] Shinder R, Al-Zubidi N, Esmaeli B. Survey of orbital tumors at a comprehensive cancer center in the United States. Head Neck 2011;33(5):610–14.
[2] Tamai H, Ishida K, Murakami K, Narita N, Tominaga T, Fuse N. Compression neuropathy caused by cancer metastasis to the optic nerve canal. BMC Res Notes 2013;6:546.
[3] NICE guideline [NG151] Published: January 29, 2020 Last updated: December 15, 2021
[4] Riihimäki M, Hemminki A, Sundquist J, Hemminki K. Patterns of metastasis in colon and rectal cancer. Sci Rep 2016;6:29765.
[5] Chen SF, Yii CY, Chou JW. Colon cancer with orbital metastasis. Clin Gastroenterol Hepatol 2011;9:e76.
[6] Nabeel M, Farooqi R, Mohebtash M, Desai R, Mansuri U, Patel S, et al. Rectal cancer in the eye: a case report of orbital metastasis. Cureus 2017;9(8):e1589. doi:10.7759/cureus.1589.
[7] Khawaja MR, Minturn JT, Spittler AJ, Chiorean EG. Ocular metastasis of colorectal cancer: an uncommon presentation of a common malignancy. Hematol Oncol Stem Cell Ther 2015;8:176–80.
[8] Palmisciano P, Ferini G, Ogasawara C, Wahood W, Bin Alamer O, Gupta AD, et al. Orbital metastases: a systematic review of clinical characteristics, management strategies, and treatment outcomes. Cancers 2022;14:94.
[9] Pearlman M, Kwong WT. A long and distant journey: a case of rectal cancer with metastasis to the orbit. Ann Gastroenterol 2015;28(1):151–2.