

# Nasolacrimal sac metastasis from colorectal carcinoma: a case report

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## Abstract

We report a rare case of metastasis to the nasolacrimal sac from colorectal carcinoma in a 69-year-old man. Despite tumor removal and endoscopic dacryocystorhinostomy with stenting, the tumor recurred 3 months later, which was treated with chemotherapy and radiotherapy. Five months later, the patient eventually died from respiratory failure secondary to malignant pleural effusion.

## Case presentation

In August 2016, a 69-year-old Chinese man presented with a 2-month history of bloody discharge associated with medial canthal swelling of the right eye. There was no proptosis, abnormalities of ocular motility, or palpable lymph nodes. Nasoendoscopy did not reveal any mass. Three years previously, he had metastatic colorectal cancer with regional lymph node and liver metastasis (stage T3N2bM1a, American Joint Committee on Cancer 7th edition). This was managed with laparoscopic anterior resection and open wedge resection of the involved liver segments, adjuvant chemotherapy, and targeted therapy. Despite aggressive treatment, there was recurrent liver metastasis and new pulmonary metastatic lesions 1 year after surgery.

Computed tomography with contrast of the orbit showed a cystic lesion at the right lacrimal sac measuring  $8.7 \times 14.7$



**Figure 1.** Computed tomography of the orbit showing right medial canthal swelling, a distended lacrimal sac, without evidence of bony erosion.

mm, without evidence of bony erosion (**Figure 1**). The radiological appearance was consistent with nasolacrimal duct obstruction, likely secondary to metastatic colorectal cancer.

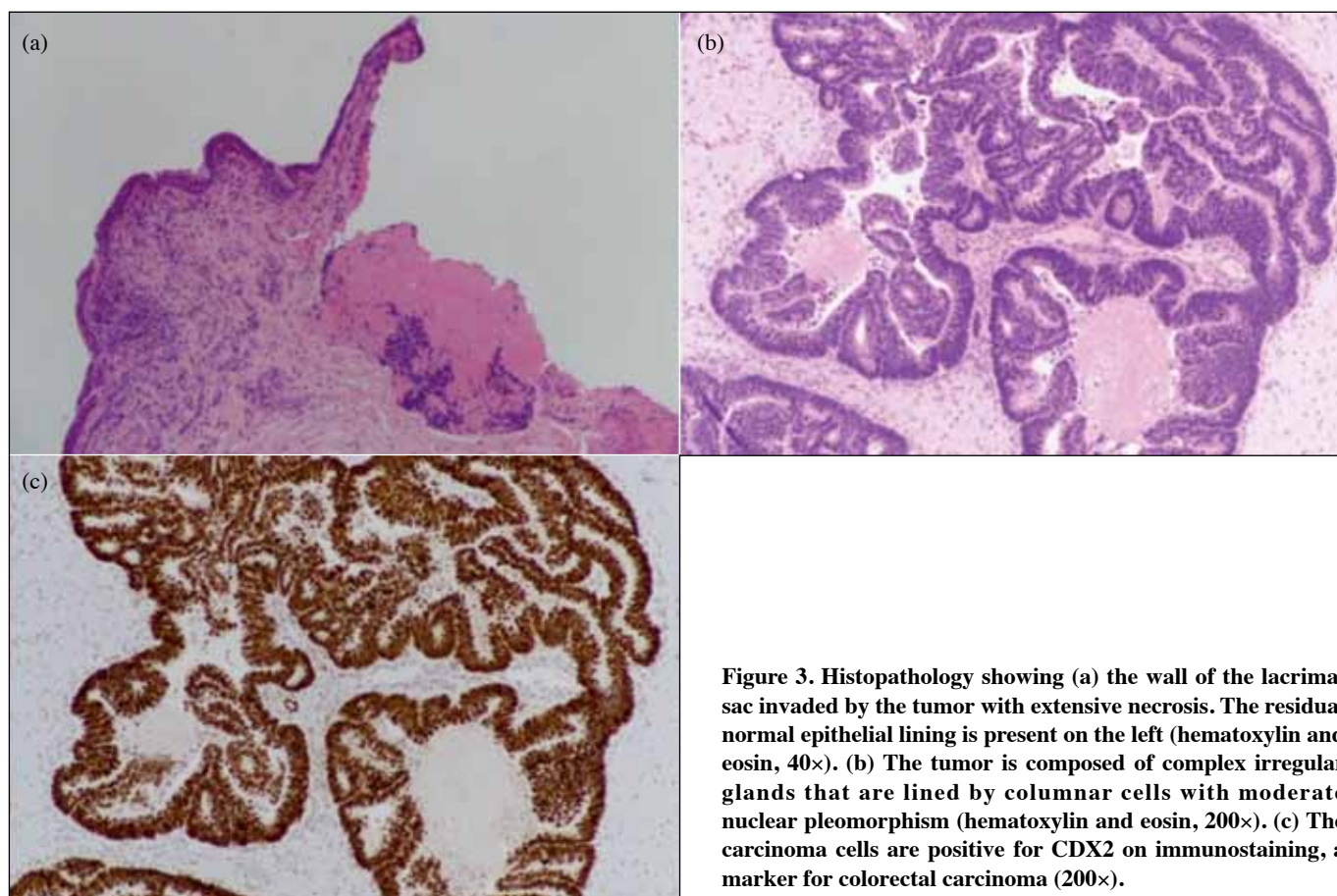
Endoscopic dacryocystorhinostomy was performed. A lacrimal mass was identified after opening the lacrimal sac (**Figure 2**). The mass was resected followed by standard



**Figure 2.** Intraoperative photograph of the lacrimal sac tumor.

silicon stent intubation. After surgery, the fistula remained patent and the silicone stent was removed 1 month later. At 1 month after surgery, no recurrence was seen on nasal endoscopy. Histopathology of the lacrimal sac tumor confirmed an adenocarcinoma with strongly positive immunohistochemical staining for CDX2, which was consistent with metastatic adenocarcinoma of intestinal origin (**Figure 3**). The tumor did not involve the resected margins. No palliative radiotherapy was performed, as recommended by the oncologist.

At 3 months after surgery, the patient had recurrent blood-stained tears. Nasal endoscopy revealed a recurrent right lacrimal sac lesion with contact bleeding. Computed tomography showed a recurrent lacrimal sac mass extending into the maxillary sinus and orbit. Targeted chemotherapy Regorafenib was given in view of multiple systemic metastases. However, the patient did not tolerate it owing to marrow toxicity. He subsequently underwent palliative radiotherapy (30 Gy) to the nasal and orbital mass. At 5 months after chemotherapy, the patient eventually died from respiratory failure secondary to malignant pleural effusion.



**Figure 3.** Histopathology showing (a) the wall of the lacrimal sac invaded by the tumor with extensive necrosis. The residual normal epithelial lining is present on the left (hematoxylin and eosin, 40 $\times$ ). (b) The tumor is composed of complex irregular glands that are lined by columnar cells with moderate nuclear pleomorphism (hematoxylin and eosin, 200 $\times$ ). (c) The carcinoma cells are positive for CDX2 on immunostaining, a marker for colorectal carcinoma (200 $\times$ ).

## Discussion

Colorectal cancer is the third most common cancer in the world and in Asia.<sup>1</sup> Metastasis occurs most commonly in the liver and lung.<sup>2-4</sup> Colorectal cancer metastases to the orbit are uncommon.<sup>5,6</sup> Metastasis to the lacrimal sac has been reported to be secondary to carcinoma of the breast, lung, prostate, cutaneous melanoma, eye, liver, kidney, and nasopharynx.<sup>5,7-10</sup> To the best of our knowledge, colorectal cancer metastasis to the nasolacrimal sac has not been reported. Metastasis to the nasolacrimal sac is defined as metastasis to the space between the globe and bony orbital walls.<sup>5</sup>

Our patient presented with a bloody discharge and medial canthal mass. Other features of lacrimal sac metastasis include overlying skin changes or mass on nasal endoscopy. This is in contrast with orbital metastasis, in which patient presents with diplopia, proptosis, and decreased vision.<sup>5</sup> Because of the atypical presentation, computed tomography was performed and revealed a cystic lesion with no bony erosion. Imaging features of a malignancy in the nasolacrimal sac include a contrast-enhancing mass with expansion or erosion of nasolacrimal bone, and possible extension to the orbit, nasal cavity, and sinuses.<sup>11-13</sup> In a series of malignant lacrimal sac and nasolacrimal duct tumors, Kumar et al<sup>13</sup> reported that smooth expansion of the bony canal was more common than bony erosion, and that contrast enhancement was demonstrated in most cases on both computed tomography and magnetic resonance imaging. However, for locally advanced malignant lacrimal sac and duct tumors, it is difficult to distinguish primary tumors from secondary tumors by imaging alone.<sup>13</sup> The diagnosis of nasolacrimal duct metastasis must be confirmed by histology.

Staged management for lacrimal sac malignancy with secondary nasolacrimal duct obstruction is suggested. Lacrimal sac exploration and biopsy should be performed

before proceeding to dacryocystorhinostomy. The histopathologic diagnosis and extent of the tumor helps plan definitive, individualized treatment. If the lacrimal sac mass is metastatic in nature, surgical resection would only be palliative.<sup>11</sup> For dacryocystorhinostomy, external approach is preferred as this does not breach the bones, which are natural barriers to tumor extension. In our patient, a one-stage endoscopic approach was performed for tumor removal and endoscopic dacryocystorhinostomy with stenting.

There is no consensus on the management of lacrimal sac metastases, because of their rarity. Current treatment options for metastases to the nasolacrimal duct include radiotherapy, chemotherapy, targeted therapy, and surgery.<sup>5</sup> Radiotherapy is effective in alleviating symptoms, but potential adverse effects include cataract, radiation retinopathy, and radiation-induced optic neuropathy. Surgical excision need not be complete or radical; the aim is to reduce symptoms, improve the quality of life, and maximize vision if possible. Our patient was treated with both chemotherapy and radiotherapy.

The median survival for colorectal metastasis to the orbit is reported to be 10 to 20 months.<sup>9</sup> Our patient with metastasis to the nasolacrimal duct also had a poor prognosis. Given the paucity of reported cases, further studies are needed to determine the prognosis of nasolacrimal sac metastasis.

## Conclusion

Metastases to the lacrimal duct are rare. In atypical history and physical examination, clinicians should be aware of neoplastic causes and conduct early evaluation.

## Declaration

The authors have no conflicts of interest to disclose.

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