Case Report
Intraocular metastasis from primary cervical cancer: A case report and review of the literature

Abby N. Uhrinak, Katherine E. Tierney, Kara L. Duncun, Koji Matsuo

Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, Los Angeles County Medical Center, University of Southern California, Los Angeles, CA, USA
Department of Pathology, Los Angeles County Medical Center, University of Southern California, Los Angeles, CA, USA
Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, Los Angeles County Medical Center, University of Southern California, Los Angeles, CA, USA
Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA, USA

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Background

Worldwide, cervical cancer is the fourth most common type of cancer in women and the most common gynecologic malignancy (Ferlay et al., 2015). It is locally invasive spreading by direct extension in the pelvis and via lymphatic dissemination in retroperitoneal lymph nodes. Hematogenous spread, the last and most rare route, occurs in advanced disease with high-grade lesions, and can cause distant metastases such as to the lungs, liver, and bone (Agarwal et al., 2002). Less common metastatic disease sites have been reported including distal skeletal sites such as the toe (Ciccone et al., 2014). Here, we report a case of cervical cancer metastasized to the eye. Given the rarity of eye metastasis, providers may not be aware of this diagnosis and could inadvertently compromise quality of life by delaying treatment.

Case

A 53-year-old woman with a known history of recurrent stage IIIB adenosquamous carcinoma of the cervix undergoing treatment with capecitabine 1000 mg twice daily presented with left eye pain. Her initial diagnosis was made three years prior. She presented with heavy vaginal bleeding causing anemia requiring a 7 unit packed red blood cell transfusion and cervical biopsy confirmed adenosquamous carcinoma (Fig. 1A). She was treated as an inpatient with emergent radiation. This was followed by cisplatin 40 mg/m² and whole pelvic radiation then tandem and ovoid intracavitary brachytherapy. The patient was diagnosed with recurrent disease five months after the completion of initial treatment. She had new retroperitoneal lymphadenopathy extending above the renal vessels outside of the radiated field. She received systemic therapy with 5 cycles of cisplatin 50 mg/m² on day 1 and gemcitabine 800 mg/m² on days 1 and 8. She then received extended field radiation and a 9 Gy boost to her aorta-caval nodes. After treatment, systemic imaging revealed new pulmonary metastasis. She was given 9 cycles of paclitaxel at 80 mg/m² given on days 1, 8 and 15. Her lung metastasis progressed and she was started on capecitabine 1000 mg twice daily. One of her lung lesions was amenable to surgical resection and she underwent pulmonary wedge resection. The pathology was consistent with metastatic squamous cell carcinoma. It was within this postoperative period that she presented with eye complaints.

Thirteen days after her most recent normal clinical exam, the patient reported a one day history of headaches and left eye pain. The patient was evaluated at an emergency department outside of our institution without intervention and discharged to home. She continued to have symptoms upon her return to our clinic 2 weeks later. An urgent ophthalmology consult was placed. Nine days after this clinic visit, she presented to an outside hospital with worsening eye pain, and had brain imaging that revealed a choroid metastasis and near total retinal detachment (Fig. 2A–B). She was discharged with instructions to seek care with an ophthalmologist at another facility. At our institution, the patient was evaluated by an ophthalmologist; however, they determined that there was no role for radiation since there was no vision to salvage. Given the painful symptoms that were negatively impacting her quality of life, the ophthalmologist proceeded with enucleation and orbital debulking of the lesion in the left eye. The procedure was uncomplicated. The pathology of the eye was consistent with a metastasis of poorly differentiated carcinoma consistent with a cervical cancer primary to the choroid (Fig. 1B). The procedure occurred approximately 2 months after her initial eye symptoms. The patient then developed rapid progression of disease including a 4 × 3 cm chest wall mass consistent with metastasis at the port site of her prior lung wedge resection. She was symptomatic with pain and underwent palliative radiation to...
the site (45 Gy with 15 fractions). Thereafter, the patient opted for hospice care. The patient died 5 months after her initial eye complaints.

Discussion

Metastatic tumors are the most common intraocular malignancy in adults. They are most commonly found in the choroid and, to a much lesser extent, in the iris and ciliary body (Shields et al., 2000). The posterior choroid is particularly susceptible to hematogenous dissemination of cancer cells due to its high vascularity. Breast and lung cancers comprise two-thirds of the primary cancers with intraocular metastases (Shields et al., 2000). The majority of patients present with blurred vision and pain, however, some are asymptomatic at the time of diagnosis (Shields et al., 2000). Cervical cancer was among the most rarely reported primary cancers with intraocular metastases (Bloch and Gartner, 1971).

A systematic literature search was performed using PubMed/MEDLINE on January 14th, 2015. The keywords “uveal or choroidal” AND “cervix or cervical” AND “cancer or metastasis” produced 106 results which were screened by title and abstract, with 4 relevant case reports found (Table 1). Three cases of cervical carcinoma with metastases to the choroid, two cases of squamous cell carcinoma (SCC) (Shibeeb et al., 2014; Inoue et al., 2000) and one of adenocarcinoma (Wiegel et al., 2000). The majority of patients present with blurred vision and pain, however, some are asymptomatic at the time of diagnosis (Shields et al., 2000). Cervical cancer was among the most rarely reported primary cancers with intraocular metastases (Bloch and Gartner, 1971).

![Fig. 1. Histopathology study for cervical cancer. A) Hematoxylin and eosin staining (40×) for cervical biopsy at the time of cervical cancer diagnosis demonstrates poorly differentiated squamous cell carcinoma, characterized by pleomorphism and high nuclear-to-cytoplasmic ratios. Geographic tumor necrosis was also seen in other areas (not shown). B) Hematoxylin and eosin staining (20×) for right eye enucleation demonstrating metastatic poorly differentiated carcinoma with extensive necrosis.](image1.png)

![Fig. 2. Imaging study for ocular metastasis of cervical cancer. A) Cross-sectional view of head MRI, and B) sagittal view of head CT scan imaging. Yellow arrow indicates orbital metastatic site in the left eye.](image2.png)
et al., 1995), as well as 1 case of SCC with metastasis to the iris (Kurosawa and Sawaguchi, 1987) were found. The median of 5 cases including our experienced case with eye metastasis of cervical cancer was 53 (range, 25–55).

In a report by Shibeeb et al., they described the case of a 52-year-old woman with progressive and painless bilateral vision loss due to retinal detachment in both the right and left eyes (Shibeeb et al., 2014). The patient was subsequently diagnosed with metastatic SCC of the cervix, visual acuity improved after radiotherapy. In a report by Inoue et al., they described the case of a 55-year-old woman who presented with vision loss in her left eye with a previously diagnosed case of stage IIIIB SCC of the cervix (Inoue et al., 2000). She was subsequently diagnosed with bilateral choroidal metastases with retinal detachment. After radiotherapy to a total dose of 36 Gy in each eye, the retinal detachment lessened. Wiegel et al. described the case of a 25-year-old pregnant woman with stage IB adenocarcinoma of the cervix who received initial treatment with chemotherapy and irradiation (Kurosawa and Sawaguchi, 1987). She presented 6 months later with decreased vision, pain, and conjunctival hyperemia of the right eye and was diagnosed with metastatic SCC to the iris. She underwent radiotherapy up to a total dose of 30 Gy with a decrease in symptoms.

According to Shields et al., treatment is prescribed to those patients with symptomatic disease and/or a tumor that threatens visual acuity (Shields et al., 2000). Of those who received treatment, the most common treatment remained external beam radiation or plaque radiation over a short period of time (Shields et al., 2000). Specifically, visual acuity may be improved with radiotherapy by decreasing the incidence of retinal detachment secondary to the metastasis (Inoue et al., 2000). In all three of the described cases with metastasis to the choroid, the presenting symptom was a decrease in visual acuity found to be secondary to retinal detachment by choroidal metastases. All three patients were treated with radiation and symptoms improved. The case with metastasis to the iris resulted in decreased vision by the nodule causing focal posterior synechia and localized cortical cataract. The size of the nodule was reduced with radiotherapy (Kurosawa and Sawaguchi, 1987).

Three of the patients described in the case reports died only 3 months after diagnosis (Shibeeb et al., 2014; Inoue et al., 2000; Kurosawa and Sawaguchi, 1987), highlighting the advanced extent of disease leading to hematogenous spread. Our patient died 5 months after her initial eye complaints. Intraocular metastasis among all patients holds a life expectancy of about 9 to 10 months (Shibeeb et al., 2014). One can assume that the diagnosis of metastasis to the eye from a primary cervical tumor is a poor prognostic indicator.

Although rare, when a woman presents with choroidal metastasis, malignancy work up including cervical cancer should be included in the differential diagnosis and diagnostic testing should include pelvic imaging and a pelvic exam (Shields et al., 2000). In addition, when a woman with known cervical cancer presents with complaints of decreased visual acuity, ophthalmologic consultation should be obtained immediately to assess for intraocular metastasis.

In summary, our case demonstrates an unusual but possible site of metastasis for cervical cancer. Providers should be aware that cervical cancer may metastatize to the eye and that swift intervention could salvage vision in these patients. Although the presence of orbital metastasis suggests rapidly progressing disease and shortened overall survival, proper diagnosis and treatment of metastatic disease to the eye can improve quality of life in these patients.

**Disclosure statement**

The authors declare that there is no conflict of interest in the study.

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Ferlay, J., Soergomataram, I., Dikshit, R., Eser, S., Mathers, C., Rebelo, M., et al., 2015. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. Int. J. Cancer 136 (5), E359–E386.

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**Table 1**

Summary of case reports of intraocular metastases from primary cervical cancer.

| Author                  | Year | Age | Symptoms                  | Cancer stage | Laterality | Intraocular met site   | Histology | Treatment                              | Survival | Outcome |
|-------------------------|------|-----|---------------------------|--------------|------------|------------------------|-----------|----------------------------------------|----------|---------|
| Shibeeb (Shibeeb et al., 2014) | 2014 | 52  | Progressive, painless vision loss | IVB          | Bilateral   | Choroid                | SCC       | External beam radiotherapy to each eye | 3 months | DOD     |
| Inoue (Inoue et al., 2000)      | 2000 | 55  | Visual field loss, decreasing vision | IIIIB        | Bilateral   | Choroid                | SCC       | Radiotherapy, 36 Gy to each eye        | 3 months | DOD     |
| Wiegel (Wiegel et al., 1995)     | 1995 | 25  | Partial vision loss       | IB           | Left        | Choroid                | Adeno     | Radiotherapy, 40 Gy, followed by chemotherapy | Unavailable | ~3 months DOD |
| Kurosawa (Kurosawa and Sawaguchi, 1987) | 1971 | 54  | Decreased vision, pain, and conjunctival hyperemia | IVB          | Right       | Iris                   | SCC       | Radiotherapy, 30 Gy                    | Unavailable | DOD     |
| Uhrinak*                   | 2015 | 53  | Pain                      | IIIB         | Left        | Choroid                | SCC       | Enucleation and orbital debulking     | 5 months | DOD     |

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*Current study.

a Age at ocular metastasis.

b Initial stage for cervical cancer.

c Survival time after ocular metastasis.

d Expectancy of about 9 to 10 months (Shibeeb et al., 2014). One can assume that the diagnosis of metastasis to the eye from a primary cervical tumor is a poor prognostic indicator.

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