Metastasis to the Orbit from Transitional Cell Carcinoma of the Bladder

Keigo Shikishima¹, Akira Miyake¹, Isao Ikemoto², and Makio Kawakami³

¹Department of Ophthalmology, Jikei University School of Medicine, Tokyo, Japan; ²Department of Urology, Jikei University School of Medicine, Tokyo, Japan; ³Department of Pathology, Clinical Service, Jikei University School of Medicine, Tokyo, Japan

Abstract

Purpose: To demonstrate the pathological features of the extremely rare metastatic transitional cell carcinoma (TCC) from the bladder to the orbit, and to review the literature on metastatic TCC to the orbit.

Methods: A 74-year-old man experienced 2 weeks of red eye, proptosis, diplopia, pain, and visual loss in the right eye. Three years previous to the current presentation, the patient had undergone a transurethral resection for superficial and moderately differentiated TCC of the bladder. A transseptal anterior orbitotomy was performed.

Results: Histopathological examination of the orbital lesion revealed nests of carcinomatous cells. Atypical pleomorphic cells with vacuolated cytoplasm were evident. The cellular morphology of the orbital lesion was identical to that of the primary TCC. There have been 12 previously reported cases of metastases to the orbit from TCC of the bladder, with the time from onset of primary TCC to observation of ocular symptoms ranging from 3 weeks to 11 years. Mean survival after orbital metastasis developed from TCC was 3.0 months.

Conclusion: This study presents a detailed description of the pathological features of metastatic TCC in the orbit. In cases of orbital metastasis from TCC, patient prognosis is very poor.

Key Words: bladder, metastasis, orbit, pathology, transitional cell carcinoma

Introduction

Until recently, occurrences of orbital metastases were infrequent. However, owing to the development of successful cancer treatments and subsequent improvement of survival rates, the incidence of orbital metastases has been increasing in cancer patients. Since orbital metastases are indicative of a poor prognosis, an accurate diagnosis and efficient management are integral parts of the treatment regimen.

The most common sites of primary tumors in adults are the breast in Western countries¹ and the lung in Japan.² However, although extremely rare, metastatic transitional cell carcinoma (TCC) from the bladder to the orbit has also been documented. In this report, we present the pathological features of a case of orbital metastases from bladder TCC and provide a literature review of metastatic TCC to the orbit.

Methods

Case Report

A 74-year-old man experienced 2 weeks of red eye, proptosis, diplopia, pain, and visual loss in the right eye. Ocular examination revealed a best-corrected visual acuity of 20/200 in the right eye and 20/20 in the left eye. The intraocular pressure was 28mmHg in the right eye and 15mmHg
in the left eye. Ocular movement was limited in all directions in the right eye, and upon examination, firm masses in the superior and inferior aspects of the right orbit were found, in addition to the presentation of exophthalmos with ciliary injection and chemosis (Fig. 1). The right ocular fundus showed choroidal folds. The left eye was unremarkable.

A computed tomography scan revealed a huge infiltrative lesion in the right orbit (Fig. 2). Three years previously, the patient had undergone a transurethral resection for superficial and moderately differentiated transitional cell carcinoma (TCC) (pT1 G2) of the bladder, and after the initial procedure he had had two recurrences (G1 and G2). He was admitted to our hospital, and a transseptal anterior orbitotomy was performed.

A chest X-ray showed pleural effusion, and aspiration revealed the presence of class V malignant cells in the effusion. Ga-scintigraphy demonstrated multiple bone metastases without intracranial metastasis. Three months after radiotherapy to the orbit combined with one course of MEC (30mg/m² methotrexate on days 1 and 15, 50mg/m² epirubicin on day 1, and 100mg/m² cisplatin on day 2) and one course of EC (50mg/m² epirubicin on day 1 and 100mg/m² cisplatin on day 2), the proptosis, diplopia, and ocular hypertension in the right eye resolved. The intraocular pressure was 20mmHg in the right eye, but the best-corrected visual acuity had decreased to 20/400. A computed tomography scan showed no change in the tumor. Treatment was well tolerated. Toxicity of chemotherapy was not serious, consisting only of myelosuppression. The patient had no nausea or vomiting. However, due to widespread metastasis, he died 7 months after the initial presentation at our hospital.

Results

Histopathological Findings

Primary Lesion in the Bladder

The biopsy specimen from the bladder revealed characteristic TCC with a papillary growth pattern (Fig. 3A). The epithelial layer was replaced by a tumor, and the tumor cells had invaded the surrounding subepithelial vessels. There was no tumor invasion into the muscle, which showed infiltration of mononuclear inflammatory cells (Fig. 3B). With higher magnification, the tumor cells were found to be atypical, with nuclear enlargement, and they were round in the superficial layer and oval in the deep layer (Fig. 3C). Many of the cells in the intermediate cell layers exhibited vacuolated cytoplasm. Although vacuolated cytoplasm is not a specific finding for TCC, intracytoplasmic vesicles or intracellular glycogen are one of findings seen in normal transitional epithelium in the bladder. Histologically, the lesion proved to be a moderately differentiated noninvasive TCC of the urinary bladder (T1 G2).

Orbital Metastatic Lesion

Histopathological examination revealed nests of carcinomatous cells in the dense fibrous tissue (Fig. 4A). There was no tubular formation. Upon higher magnification, the nuclei of the tumor cells were found to be irregular, round, or oval in shape, and with prominent nucleoli and cleavage

in the left eye. Ocular movement was limited in all directions in the right eye, and upon examination, firm masses in the superior and inferior aspects of the right orbit were found, in addition to the presentation of exophthalmos with ciliary injection and chemosis (Fig. 1). The right ocular fundus showed choroidal folds. The left eye was unremarkable.

A computed tomography scan revealed a huge infiltrative lesion in the right orbit (Fig. 2). Three years previously, the patient had undergone a transurethral resection for superficial and moderately differentiated transitional cell carcinoma (TCC) (pT1 G2) of the bladder, and after the initial procedure he had had two recurrences (G1 and G2). He was admitted to our hospital, and a transseptal anterior orbitotomy was performed.

A chest X-ray showed pleural effusion, and aspiration revealed the presence of class V malignant cells in the effusion. Ga-scintigraphy demonstrated multiple bone metastases without intracranial metastasis. Three months after radiotherapy to the orbit combined with one course of MEC (30mg/m² methotrexate on days 1 and 15, 50mg/m² epirubicin on day 1, and 100mg/m² cisplatin on day 2) and one course of EC (50mg/m² epirubicin on day 1 and 100mg/m² cisplatin on day 2), the proptosis, diplopia, and ocular hypertension in the right eye resolved. The intraocular pressure was 20mmHg in the right eye, but the best-corrected visual acuity had decreased to 20/400. A computed tomography scan showed no change in the tumor. Treatment was well tolerated. Toxicity of chemotherapy was not serious, consisting only of myelosuppression. The patient had no nausea or vomiting. However, due to widespread metastasis, he died 7 months after the initial presentation at our hospital.

Results

Histopathological Findings

Primary Lesion in the Bladder

The biopsy specimen from the bladder revealed characteristic TCC with a papillary growth pattern (Fig. 3A). The epithelial layer was replaced by a tumor, and the tumor cells had invaded the surrounding subepithelial vessels. There was no tumor invasion into the muscle, which showed infiltration of mononuclear inflammatory cells (Fig. 3B). With higher magnification, the tumor cells were found to be atypical, with nuclear enlargement, and they were round in the superficial layer and oval in the deep layer (Fig. 3C). Many of the cells in the intermediate cell layers exhibited vacuolated cytoplasm. Although vacuolated cytoplasm is not a specific finding for TCC, intracytoplasmic vesicles or intracellular glycogen are one of findings seen in normal transitional epithelium in the bladder. Histologically, the lesion proved to be a moderately differentiated noninvasive TCC of the urinary bladder (T1 G2).

Orbital Metastatic Lesion

Histopathological examination revealed nests of carcinomatous cells in the dense fibrous tissue (Fig. 4A). There was no tubular formation. Upon higher magnification, the nuclei of the tumor cells were found to be irregular, round, or oval in shape, and with prominent nucleoli and cleavage

A chest X-ray showed pleural effusion, and aspiration revealed the presence of class V malignant cells in the effusion. Ga-scintigraphy demonstrated multiple bone metastases without intracranial metastasis. Three months after radiotherapy to the orbit combined with one course of MEC (30mg/m² methotrexate on days 1 and 15, 50mg/m² epirubicin on day 1, and 100mg/m² cisplatin on day 2) and one course of EC (50mg/m² epirubicin on day 1 and 100mg/m² cisplatin on day 2), the proptosis, diplopia, and ocular hypertension in the right eye resolved. The intraocular pressure was 20mmHg in the right eye, but the best-corrected visual acuity had decreased to 20/400. A computed tomography scan showed no change in the tumor. Treatment was well tolerated. Toxicity of chemotherapy was not serious, consisting only of myelosuppression. The patient had no nausea or vomiting. However, due to widespread metastasis, he died 7 months after the initial presentation at our hospital.

Results

Histopathological Findings

Primary Lesion in the Bladder

The biopsy specimen from the bladder revealed characteristic TCC with a papillary growth pattern (Fig. 3A). The epithelial layer was replaced by a tumor, and the tumor cells had invaded the surrounding subepithelial vessels. There was no tumor invasion into the muscle, which showed infiltration of mononuclear inflammatory cells (Fig. 3B). With higher magnification, the tumor cells were found to be atypical, with nuclear enlargement, and they were round in the superficial layer and oval in the deep layer (Fig. 3C). Many of the cells in the intermediate cell layers exhibited vacuolated cytoplasm. Although vacuolated cytoplasm is not a specific finding for TCC, intracytoplasmic vesicles or intracellular glycogen are one of findings seen in normal transitional epithelium in the bladder. Histologically, the lesion proved to be a moderately differentiated noninvasive TCC of the urinary bladder (T1 G2).

Orbital Metastatic Lesion

Histopathological examination revealed nests of carcinomatous cells in the dense fibrous tissue (Fig. 4A). There was no tubular formation. Upon higher magnification, the nuclei of the tumor cells were found to be irregular, round, or oval in shape, and with prominent nucleoli and cleavage

A chest X-ray showed pleural effusion, and aspiration revealed the presence of class V malignant cells in the effusion. Ga-scintigraphy demonstrated multiple bone metastases without intracranial metastasis. Three months after radiotherapy to the orbit combined with one course of MEC (30mg/m² methotrexate on days 1 and 15, 50mg/m² epirubicin on day 1, and 100mg/m² cisplatin on day 2) and one course of EC (50mg/m² epirubicin on day 1 and 100mg/m² cisplatin on day 2), the proptosis, diplopia, and ocular hypertension in the right eye resolved. The intraocular pressure was 20mmHg in the right eye, but the best-corrected visual acuity had decreased to 20/400. A computed tomography scan showed no change in the tumor. Treatment was well tolerated. Toxicity of chemotherapy was not serious, consisting only of myelosuppression. The patient had no nausea or vomiting. However, due to widespread metastasis, he died 7 months after the initial presentation at our hospital.

Results

Histopathological Findings

Primary Lesion in the Bladder

The biopsy specimen from the bladder revealed characteristic TCC with a papillary growth pattern (Fig. 3A). The epithelial layer was replaced by a tumor, and the tumor cells had invaded the surrounding subepithelial vessels. There was no tumor invasion into the muscle, which showed infiltration of mononuclear inflammatory cells (Fig. 3B). With higher magnification, the tumor cells were found to be atypical, with nuclear enlargement, and they were round in the superficial layer and oval in the deep layer (Fig. 3C). Many of the cells in the intermediate cell layers exhibited vacuolated cytoplasm. Although vacuolated cytoplasm is not a specific finding for TCC, intracytoplasmic vesicles or intracellular glycogen are one of findings seen in normal transitional epithelium in the bladder. Histologically, the lesion proved to be a moderately differentiated noninvasive TCC of the urinary bladder (T1 G2).