

Orbital Metastatic Tumors Difficult Diagnostic Situations

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Abstract

Introduction: Orbital metastases compose about 15% of all orbital malignant tumors. If a cancer patient has got some orbital lesion everyone thinks about orbital metastasis. But a cancer patient sometimes has other orbital tumors or inflammatory orbital lesions.

The aim of the work is to identify distinctive features of the orbit metastatic tumor for differential diagnosis with other tumors and inflammatory lesions in the orbit.

Material and Methods: Retrospective, non-comparative, chart review of 81 cancer patients. 74 patients (10 men and 64 women aged 18 – 87 years old, median 45 years old) had orbital metastases, 5 patients had the second malignant orbital tumor - primarily multiple malignant tumors (1 man and 4 women aged 55 – 78 years old, median 61 years old), and 2 men (64, 66 years old accordingly) had inflammatory orbital lesions. All the patients underwent complete ophthalmological and general examination.

The orbital lesions were studied morphologically.

Results: Distinctive features of the orbit metastatic tumor are the following: not rapid but gradual development of symptoms. As a rule there is a single well-delimited tumor in the orbit. Metastatic tumor is mainly localized under the upper wall of the orbit in the anterior or middle part of the orbit. Due to the localization of the tumor; exophthalmoses develop with displacement of the eyeball (mechanical strabismus). The main symptom of the orbital metastases is the limitation of the eye movements. The symptoms of orbital non-Hodgkin's lymphoma are identical to the symptoms of orbital metastases. Acute orbital inflammation, simulating metastases, had atypical erased symptoms.

Conclusion: Only a comprehensive assessment of anamnesis data, clinical symptoms and the results of morphological examination of biopsy sample allows establishing the correct diagnosis of the orbital metastatic tumor. Palliative treatment of orbital metastases improves the quality of life of cancer patients.

Keywords: Orbital metastases, Orbital non-Hodgkin's lymphomas, Orbital inflammation, Differential diagnosis

Introduction

The orbital metastases rarely develop. They occur in 2-3% of cancer patients and indicate haematogenous dissemination of a primary cancer [1,2]. On the other hand they compose about 15% of all orbital malignant tumors. If a cancer patient has got some orbital lesion everyone thinks about orbital metastases. But a cancer patient sometimes has other orbital tumors. In addition, inflammatory lesions of the orbit can develop in cancer patients.

The aim of the work is to identify distinctive features of the orbit metastatic tumor for differential diagnosis with other tumors and inflammatory lesions in the orbit.

Material and Methods

Retrospective, non-comparative, chart review of 81 cancer patients: 74 patients had orbital metastases, 5 patients had the second malignant orbital tumor – primarily multiple malignant tumors and 2 patients had inflammatory orbital lesions. Among the patients with orbital metastases women prevailed (10 men and 64 women). The age ranged from 18 to 87, median 45 years old. Among the patients with primarily multiple malignant tumors women also predominated. The age of the patients was 55 – 78, median 61 years old. Two men with had inflammatory orbital lesions were 64 and 66 years old accordingly. All the patients underwent complete ophthalmological and general examination. All the patients CT and ultrasonography of orbit were performed.

The orbital lesions were studied morphologically.

Results

In the most patients, primary tumors were known by the time of diagnosis of orbital metastases. Primary tumors were diverse. Breast carcinoma prevailed. Information about primary tumors is summarized in Table 1.

Table 1: Information about Primary Tumor

Primary tumor	Frequency
Breast carcinoma	63.5%
Lung carcinoma	14.9%
Colon cancer	5.4%
Prostate cancer	2.7%
Kidney cancer	2.7%
Cutaneous melanoma	2.7%
Other tumors (in the amount)	8.1%

It is necessary to emphasize that orbital metastases were an initial manifestation of malignant tumor in 8 patients (10.8% cases). As a rule orbital metastases indicated extensive haematogenous dissemination of a primary cancer. But orbital metastases were an initial manifestation of a metastatic disease in 7 patients (9.5% cases).

The time interval from the diagnosis of a breast cancer to the emergence of orbital metastases was 2-4 years, from diagnosis of a lung cancer – 0, 5-1 year. In our experience the orbital metastases developed in 13 and even 17 years after the treatment of breast cancer in two women.

Symptoms of orbital metastases were varied. The frequency of different symptoms is shown in Table 2. Ptosis of upper eyelid, proptosis (Figure 1), red chemosis (Figure 2), mechanical strabismus, decrease of visual acuity was the most frequent clinical signs. Pain in the orbit rarely developed. The main symptom of the orbital metastases is the limitation of the eye movements. A metastasis of breast cancer sometimes has got the different symptoms. Enophthalmos is combined with limited eye mobility and difficulty in eye reposition in 8 breast cancer patients (Figure 3).

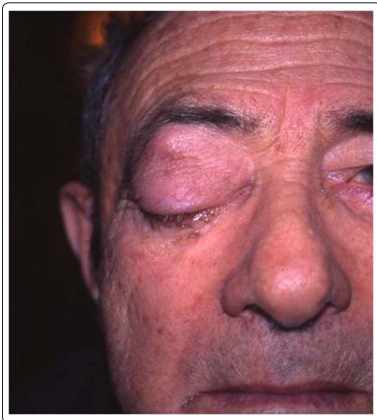


Figure 1: Patient A. 76 years old. Metastasis of lung cancer in the right orbit. Ptosis of the upper eyelid

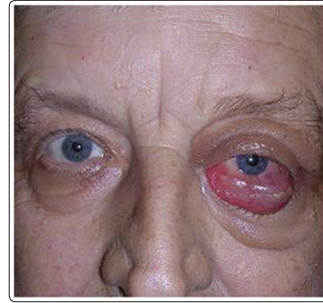


Figure 2: Patient C. 47 years old. Metastasis of kidney cancer in the left orbit. Conjunctival edema with injection of episcleral vessels – red chemosis



Figure 3: Patient M. 49 years old. Metastasis of breast cancer in the left orbit. Enophthalmos is combined with limited eye mobility and difficulty in eye reposition

Table 2: Symptoms of the Orbital Metastases

Symptoms	Frequency
Visual acuity decrease	27.8%
Eyelid ptosis	29.7%
Mechanical strabismus	79.7%
Eyelid edema	20.5%
Chemosis	18.5%
Proptosis	89.2%
Pain	3.1%
Enophthalmos	10.8%

Consequently, distinctive features of the orbit metastatic tumor were the following: not rapid but gradual development of symptoms. As a rule there was a unilateral single tumor in the orbit. Metastatic tumor was mainly localized under the upper wall of the orbit. The tumor was more often localized in the anterior or middle part of the orbit. Due to the localization of the tumor, exophthalmos developed with displacement of the eyeball (mechanical strabismus). Sometimes enophthalmos was combined with limited eye mobility and difficulty of eye reposition. The main symptom of the orbital metastases was the limitation of the eye movements.

Computed tomography usually showed a single well-delimited mass in the extraconal part of the orbit. Sometimes orbital metastatic tumor looked like mass with fuzzy borders (Figure 4).

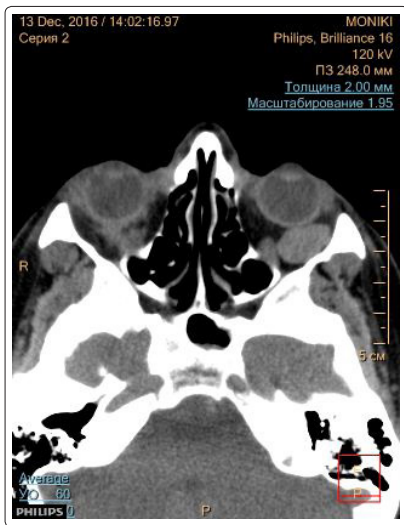
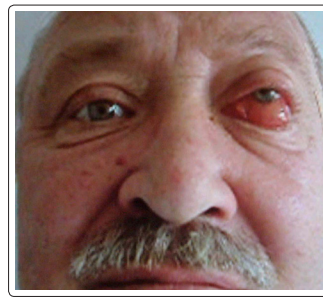
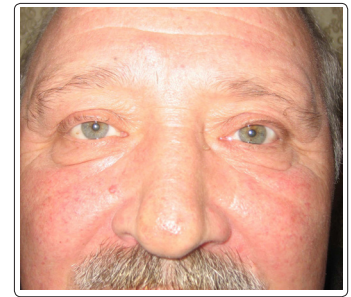


Figure 4: Patient A. 56 years old with breast cancer. Axial CT scan: bilateral orbital tumors. There is a tumor with fuzzy borders in the right orbit. It's a metastasis of breast cancer. There is a well-delimited tumor in the left orbit. It is a hemangioma



A. Before treatment



B. After inflammatory treatment

Figure 5: Patient K. 64 years old with cutaneous melanoma of the right tibia (remission), diffuse large B cell lymphoma of lymph nodes (remission) and acute inflammation of right orbit

5 cancer patients had primarily multiple malignant tumors. Primarily multiple malignant tumors are the independent several malignant tumors of different histogenesis in the same organism. One tumor is not a metastasis of the other tumor. The diseases histories of 5 cancer patients with primarily multiple malignant tumors are shown in Table 3.

Table 3: The Diseases Histories of the Cancer Patients with Primarily Multiple Malignant Tumors

pts	Diseases Histories	Orbital Symptoms
K, 61 years old	Ovarian cancer. In 3 years Diffuse large B cell lymphoma of the right orbit and peripheral lymph nodes	exophthalmos 3 mm, partial upper eyelid ptosis, limitation of the eyeball movements
X, 78 years old	Uterine body cancer. In 2 years MALT- lymphoma of the right orbit	exophthalmos 4 mm, the eye displaced upwards, limitation of the eyeball movement downwards
K, 58 years old	Uterine cervical cancer. In 16 years Follicular lymphoma of the right orbit and peripheral lymph nodes	exophthalmos 2 mm, the eye displaced downwards 50, slight limitation of the eyeball movement upwards
G, 55 years old	Breast carcinoma. In 4 years MALT-lymphoma of the left lacrimal gland and salivary glands	exophthalmos 3 mm, slight limitation of the eyeball movement upwards and to the outside
A, 73 years old	Prostate cancer. In 3 years MALT-lymphoma of the left orbit	exophthalmos 3 mm, limitation of the eyeball mobility in all directions

The second orbital tumors were Non-Hodgkin's lymphomas in the patients. The symptoms of orbital non-Hodgkin's lymphoma were identical to the symptoms of orbital metastases. The all patients with non-Hodgkin's orbit lymphoma had got limited mobility of the eye.

Inflammatory orbital lesions, simulating metastases, developed in 2 cancer patients. We described these cases previously [3].

Case 1: The man of 66-years old had got laryngectomy due to larynx cancer. In 3years an infiltrate under the orbital roof provoked recurrent upper eyelid edema. 3-mm exophthalmos and mild upward limitation of eye movements were revealed. No larynx cancer recurrence or metastases of other organs were detected. Transcutaneous orbitotomy was performed. Intra-op living helminth *Dirofilaria* and its granuloma were removed. Morphological examination of the helminth showed *Dirofilaria* repens.

Case 2: The second patient of 64 years old complained of pain in the left orbit, left-side exophthalmos, redness of the left eye, decrease of visual acuity OS. The exophthalmos had arisen and increased rapidly. There was pain in the orbit and diplopia His past history is the following: cutaneous melanoma of the right tibia was removed in 1973. The follow-up period was 35 years. There was no recurrence

or metastases of the disease. Diffuse large B cell lymphoma of lymph nodes was revealed in 2003. He received 6 courses of chemotherapy: CIOP. There is no recurrence of the lymphoma now. Orbital lesion and exacerbation of chronic pyelonephritis developed in 2006.

Transconjunctival orbitotomy was performed. Histological examination revealed perivascular lymphocytic infiltration. No tumor cells were found. The diagnosis of acute inflammation of left orbital tissues was established (Figure 5). It should be born in mind that histological picture of acute inflammation of orbit tissues is sometimes atypical in cancer patients.

Discussion

The diagnosis of orbital metastasis is not difficult to establish if the primary tumor is known and there is information about metastases in other organs. As a rule orbital metastasis indicates extensive haematogenous dissemination of a primary cancer. But orbital metastases may be the first manifestation of the primary tumor or the first manifestation of metastatic disease [4,5].

These are the most difficult diagnostic situations. It is important to collect a disease history completely.

The time interval from the diagnosis of a primary tumor to the emergence of orbital metastases is usually several years (2 – 4 years). In the literature there is evidence of the early development of orbital metastases [6]. In our experience the orbital metastases developed in 13 and even 17 years after the treatment of breast cancer in two women.

Information about growth rates of the orbital lesions is important for differential diagnosis. Growth rate of the orbital metastatic tumors amounts to several months. Acute inflammatory diseases of the orbit develop rapidly. But the growth of metastases of some malignant tumors is very fast [7]. On the other hand cancer patients have got atypical clinical symptoms of acute inflammation of the orbital tissues. It is possible the symptoms develop not rapidly but gradually [3]. Thus it is impossible to be guided only by data of anamnesis.

Symptoms of orbital metastases were varied. Metastatic tumors of the orbit are characterized by gradual development of symptoms. As a rule there is a single well-delimited tumor in the orbit. Metastatic tumor is mainly localized under the upper wall of the orbit in the anterior or middle part of the orbit. Due to the localization of the tumor, exophthalmos is develops with displacement of the eyeball (mechanical strabismus). Sometimes enophthalmos is combined with limited eye mobility and difficulty in eye reposition in breast cancer patients [3,4,8]. The main symptom of the orbital metastases is the limitation of the eye movements. The symptoms of orbital non-Hodgkin's lymphoma are often identical to the symptoms of orbital metastases. Acute orbital Inflammation, simulating metastases, had atypical erased symptoms. When difficult diagnostic situations develop histological verification of an orbital lesion is required.

Conclusion

Comprehensive assessment of anamnesis data, clinical symptoms and the results of morphological examination allows to establish the correct diagnosis of orbital lesion.

The survival of the cancer patients with orbital metastases is low (1.5-2.0 years after detection). But palliative treatment of orbital metastases improves the quality of life of cancer patients.

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