



## Isolated eyeball metastasis of non-seminomatous germ cell testicular tumor

### Metastaza neseminomskog germinativnog tumora testisa u očnu jabučicu

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#### Abstract

**Introduction.** Testicular tumors most frequently metastasize to regional lymph nodes. Non-seminomatous tumor metastasis of testicle (NSGCTT) to the eyeball is rare.

**Case report.** We presented a 24-year old man, referred to the ophthalmologist due to acute pain and abrupt loss of sight in the left eye accompanied by its enlargement. Orbital and endocranial computerized tomography (CT) was carried out, indicating the tumor in the left eye. His previous medical history provided the information that the right testicle was painlessly enlarged for 8 months. Ultrasonography showed a completely tumorously altered testis. Abdominal and chest CT failed to reveal any secondary deposits in visceral organs and lymph glands. Tumor markers (AFP – alpha-fetoproteins, beta hCG – human chorionic gonadotropin beta) were elevated. Right radical orchiectomy was performed (showed NSGCTT), followed by polychemotherapy with cisplatinum 100 mg/m<sup>2</sup>, etoposide 120 mg/m<sup>2</sup>, bleomycin 15 mg/m<sup>2</sup> (PEB × 4), resulting in normalization of tumor marker values and significant regression of the left eyeball. Next, the left eye enucleation and ocular prosthesis implantation was carried out. Pathohistological evaluation indicated fibrosis and necrosis only. In a 5-year follow-up period, the patient was free of recurrence. **Conclusion.** Isolated hematogenous metastasis of the NSGCTT to the eye is rare. In our case, the left eye was the only metastatic localization. After chemotherapy and eye enucleation the patient was in a 4-year follow-up period free of the recurrence.

#### Key words:

testicular neoplasms; neoplasm metastasis; eye; orchiectomy; antineoplastic combined chemotherapy protocols; eye enucleation.

#### Apstrakt

**Uvod.** Tumori testisa najčešće daju metastaze u regionalne limfne čvorove. Metastaze neseminomskog germinativnog tumora testisa (NSGTT) u očnu jabučicu su retke. **Prikaz bolesnika.** Prikazali smo mladića, starog 24 godine, koji se javio oftalmologu zbog naglog bola i gubitka vida na levo oko praćenog njegovim uvećanjem. Učinjena je kompjuterizovana tomografija (KT) orbite i endokranijuma koja je pokazala tumor levog oka. Anamnestički, bolesnik je dao podatak o bezbolnom uvećanju levog testisa. Ultrazvučnim pregledom otkriven je kompletno tumorski izmenjen desni testis. Kompjuterizovanom tomografijom abdomena i grudnog koša nisu nađene patološke promene na visceralnim organima i limfnim žlezdama u retroperitoneumu. Tumorski markeri (AFP – alfa-fetoproteini, beta HCG – horionski gonadotropin) bili su povišeni. Učinjena je desnostrana radikalna orhiektomija (patohistološki nalaz – NSGTT) i otpočeto je sa primenom citostatske polihemioterapije: cisplatin 100 mg/m<sup>2</sup>, etopozid 120 mg/m<sup>2</sup>, bleomicin 15 mg/m<sup>2</sup> (PEB × 4), što je dovelo do normalizacije vrednosti tumorskih markera i značajne regresije tumora oka. Nakon toga, učinjena je enukleacija levog oka sa implantacijom okularne proteze. Patohistološki nalaz izvađenog preparata bio je fibroza i nekroza. U 4-godišnjem praćenju bolesnik je bio bez znakova recidiva bolesti. **Zaključak.** Izolovane hematogene metastaze NSGTT u oku veoma su retke. Kod prikazanog bolesnika levo oko bilo je jedina lokalizacija metastaze. Nakon hemoterapije i enukleacije levog oka bolesnik je tokom četvorogodišnjeg praćenja bio bez recidiva bolesti.

#### Ključne reči:

testis, neoplazme; neoplazme, metastaze; oko; orhiektomija; lečenje kombinovanjem antineoplastika, protokoli; oko, enukleacija.

#### Introduction

Testicular tumors most frequently metastasize to regional lymph nodes. However, if histopathological examina-

tion of testicular tumor confirms choriocarcinoma, hematogenous metastases might be expected. Most commonly metastatic sites can be present in pulmonary parenchyma, but rarely may be found in organs not otherwise expected. The

very fact of the presence of nonpulmonary metastases represents poor prognostic factor. Unfortunately, the outcome of these patients is usually fatal in spite of chemotherapy and other therapeutic options<sup>1-4</sup>.

Isolated hematogenous metastases to distant organs (brain, kidney, liver, bones, eye) are rare. Secondary deposits in the eye are extremely rare, and such cases have been discussed in published articles.

### Case report

A 24-year-old man with sudden pain and loss of sight in the left eye associated with its enlargement referred to the ophthalmologist. He reported that he had experienced the problems with sight about two weeks earlier manifested in blurred vision as if a "curtain" was pulled over his eye. Computerized tomography of the orbit and endocranium (Figure 1) revealed a 12 mm soft tissue mass in the eye, located in the left bulbous behind the lens, which was not stained after *iv* contrast injection. The left lacrimal gland was enlarged and the left upper lid was edematous.

The patient's medical history provided the information on painless enlargement of the right testicle some 8 months ago. A complete urological evaluation was carried out. A painless hard enlargement, 6 × 6 cm in size, of the right testicle was found. Ultrasonography examination showed the enlarged, nonhomogenous, completely tumorously altered

testicle with intact tunica albuginea. Tumor marker levels were elevated: alpha-fetoproteins (AFP) 4977 ng/mL, and beta humane chorionic gonadotrophin (hCG) 3557 mIU/mL. Computerized tomography of the abdomen failed to show any secondary deposits in the parenchymatous organs or any enlargement of retroperitoneal lymphnodes. Radiography of the lungs was normal.

The right radical orchiectomy was performed, and histopathology disclosed non-seminomatous mixed germ-cell testicular tumor (NSGCTT).

In a postoperative period, the values of tumor markers declined. Due to NSGCTT with the increased values of tumor markers and distant metastases, polychemotherapy by PEB protocol (cisplatinum 100 mg/m<sup>2</sup>, etoposide 120 mg/m<sup>2</sup>, bleomycin 15 mg/m<sup>2</sup>) was introduced. A total of 4 cycles of the therapy were administered, which was well tolerated; consequently, the tumor marker values restored to normal (AFP 4.3 ng/mL, beta hCG 1.4 mIU/mL) with a considerable reduction of the formerly enlarged left eye, that was verified by CT scan of the orbit and endocranium (soft-tissue mass in the left bulbous was not imbibed by contrast) (Figure 2). Due to such outcome the left eye enucleation with ocular prosthesis implantation was carried out. Pathohistological examination proved the presence of fibrosis and necrosis only, without elements of vital cancer. The patient was controlled on regular basis and within a 4-year follow-up period the patient was free of recurrence of the underlying disease.

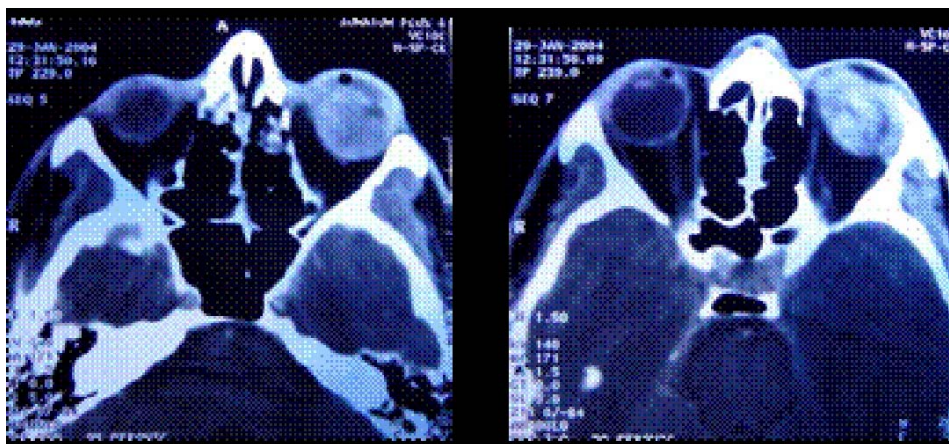


Fig. 1 – Computerized tomography of the orbit – the left eye changed by the tumor

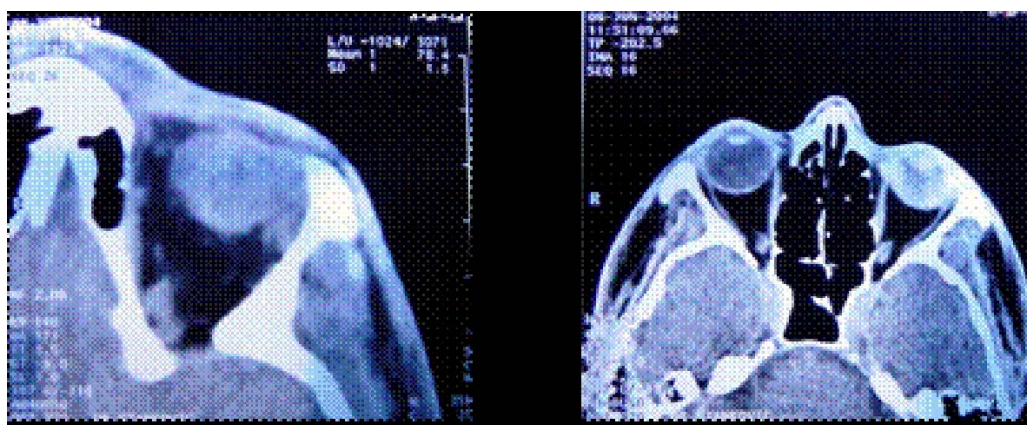


Fig. 2 – Computerized tomography of the orbit after polychemotherapy

## Discussion

Testicular tumors are completely curable diseases even when they present with distant metastases. They primarily metastasize *via* lymphatic pathway to regional lymphatics and along the major blood vessels. The most common visceral hematogenous metastases of testicular tumors are to the lungs, liver, brain and bones. For easier evaluation of prognosis of testicular tumors, prognostic factors have been introduced, *ie* high values of tumor markers, mediastinum-origin tumor and the presence of non-pulmonary visceral metastases.

Due to a new more efficacious therapeutical protocol and, thus, longer survival of patients with malignant tumors of different primary localizations, patients with orbital metastases are seen more often. However in case of patients with testicular tumors, orbital metastases are still exceptional. Only a few cases have been reported in the available literature. Nevertheless, in all of these cases, metastatic changes of the eye were associated with other organs metastases (lungs, retroperitoneum, brain, etc).

It is well-known that choriocarcinoma metastasizes by hematogenous way and is followed by high hCG values, what accounts for multiple localizations of primary metastases. Literature review suggests that the very choriocarcinoma is the most frequent histological form found in intraocular metastases<sup>5-7</sup>. According to Kavanagh et al.<sup>4</sup>, metastases of testicular choriocarcinoma to the eye are rare, and a reader may find about dozen references in the literature, with that all the authors reported an association with other metastases. As the sequelae of secondary deposits in several organs and

choriocarcinoma are unfavorable histological variation, the survival of these patients was very poor. Only Nakajima et al.<sup>1</sup> described a successful outcome of patients with multiple secondary deposits in the eye, brain and lungs.

Isolated orbital metastases are very rare. Rush et al.<sup>2</sup> published the article on metastasis of testicular seminoma to the eye which was successfully treated by radiotherapy. Lodato et al.<sup>6</sup> described metastasis of the embryonal cancer to the eye and, reviewing the primary and secondary eye tumors, they stressed the need for systemic examination in case of young people with ocular tumors. Kiyamaz et al.<sup>8</sup> reported a case with embryonal testicular cancer with metastases to brain and eye with, unfortunately, fatal outcome, while the embryonal cancer tissue was found in the eye on post-mortem examination.

## Conclusion

In our case, the left eye was the only metastatic localization and isolated metastasis of non-seminomatous testicular tumor. During chemotherapy, the values of serum tumor markers were restored to the normal ones and the eye tumor volume was reduced. Eye enucleation, where residua of secondary deposits remained after chemotherapy, was necessary because it could not be definitely established if eye tumor had been completely eliminated by the therapy. Final histological examination of the eye specimen failed to show any vital cancer, with only fibrosis and necrosis found, as the result of chemotherapy with a complete response.

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