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(CASE REPORT)

Pulmonary metastases revealing a mixed germ cell tumor with a predominant yolk sac tumor component: A case report

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Abstract

Yolk sac tumor of the testis is rare in adults. Its diagnosis is histological, reproducing an extra-embryonic structure (endodermal sinus tissue). It can be present alone or associated with another component, thus forming a mixed germ cell tumor. Treatment involves orchiectomy and chemotherapy in extratesticular stages. Lymph node dissection is indicated if residual masses persist. These tumors are characterized by a poor prognosis at an advanced metastatic stage. However, we report the clinical case of a 69-year-old man who presented with pulmonary metastases from a mixed germ cell tumor of the testis with a predominant Yolk Sac Tumor component, treated by orchiectomy, chemotherapy, and lymph node dissection.

Keywords: Cancer; Mixed germ cell tumor; Yolk Sac Tumor; Testis; Metastases

1. Introduction

The incidence of testicular cancer is continuously increasing, predominantly driven by germ cell tumors, which account for 95% of cases [1]. Yolk sac tumor, common in children and often pure [2], is rare in adults. In its metastatic stage, the treatment is standardized (inguinal orchiectomy followed by chemotherapy in 3 or 4 cycles depending on the prognostic group).

In this article, we present the clinical case of an elderly patient with a non-seminomatous mixed germ cell tumor of the testis with a predominant yolk sac component at stage III metastatic to the lung.

2. Case presentation

Mr. B.R., a 69-year-old man with no toxic habits, consulted for exertional dyspnea associated with a productive cough bringing up blood-streaked sputum for the past 2 months, in a context of afebrility and general health deterioration. He had no history of cancer. Clinical examination revealed a 7 cm, hard, irregular right testicular mass without inflammatory signs, and negative transillumination. The contralateral testicle was normal. Examination of the lymph node areas revealed a 5 cm, tender, fixed, irreducible right inguinal swelling.

The tumor marker assay indicated an elevation of lactate dehydrogenase (LDH) to 500 IU/L (>1.5N). Total chorionic gonadotropin (hCG) was at a normal level of 1 mIU/mL. Alpha-fetoprotein (AFP) was > 250 times the normal level (2852 IU/mL). The chest X-ray revealed three well-defined, dense, homogeneous nodular opacities bilaterally (Figure 1). On the thoraco-abdomino-pelvic CT scan, there was a left basal pulmonary tumor process associated with bilateral nodules,

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suggestive of secondary lesions; a suspicious right testicular mass associated with a necrotic ipsilateral inguinal lymphadenopathy (Figure 2a and 2b).

A bronchoscopy revealed a diffuse first-degree inflammatory state, with the presence of a pearly white tumor bud visible at the entrance of the posterior basal segment, making it uncannulable. A cytodiagnostic study showed the presence of malignant cells. A bronchial biopsy revealed a broncho-pulmonary metastatic localization of a non-seminomatous mixed germ cell tumor with a predominant Yolk Sac Tumor component (Figure 3). On scrotal ultrasound: the right testicle was swollen and heterogeneous, with fairly well-defined hypoechoic nodular formations, associated with dilation of the rete testis, a swollen and heterogeneous appearance of the epididymis, and a minimal hydrocele (Figure 4). A lymph node biopsy revealed a poorly differentiated process with a morphological and immunohistochemical appearance compatible with a localization of a yolk sac tumor (Figure 5).

An inguinal orchiectomy with primary ligation of the spermatic cord was performed (Figure 6). The histopathological examination of the surgical specimen confirmed the diagnosis of a malignant non-seminomatous mixed germ cell tumor composed of four components, including a yolk sac component representing 60% of the proliferation with Schiller-Duval bodies (Figure 7a). One component was seminomatous in appearance, representing 10%, embryonal carcinoma 15%, neuroblastic 10% with ependymal rosettes (Figure 7b), and teratomatous during maturation containing cartilage, glandular tissue, and rhabdomyocytes (Figure 7c). Vascular emboli were also noted, associated with a completely tumorous lymph node mass.

The LDH level decreased postoperatively to 100UI/L. The tumor was classified as S2 pT3, pN3, M1b, at stage III. Chemotherapy was initiated: 4 cycles of BEP (Bleomycin, Etoposide, Cisplatin).

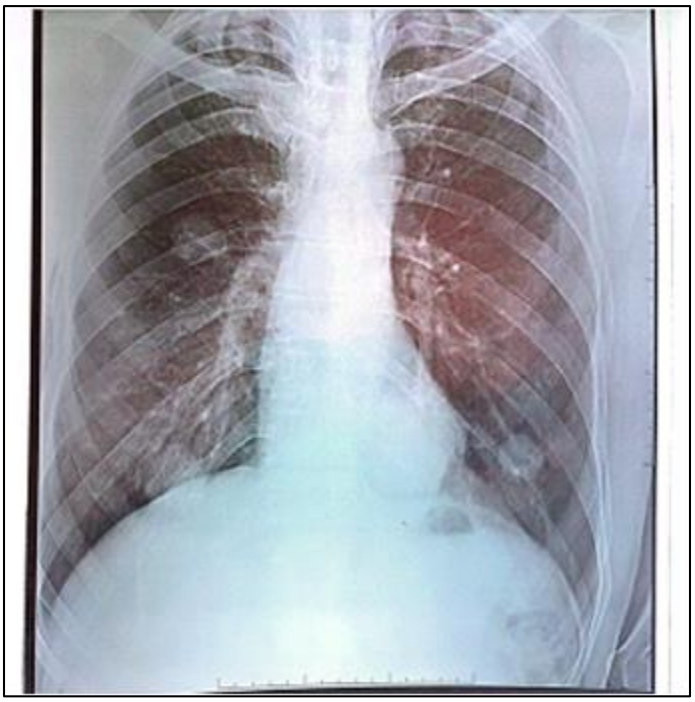

Figure 1 Cannonball appearance on chest X-ray

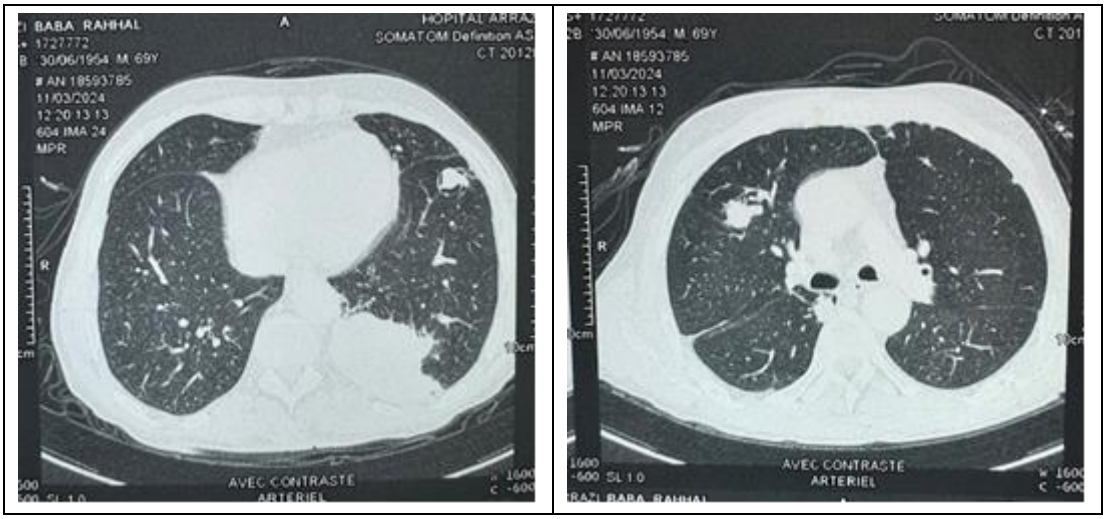

Figure 2a Thoracic CT scan in parenchymal window showing a left basal pulmonary tumor process associated with bilateral nodules

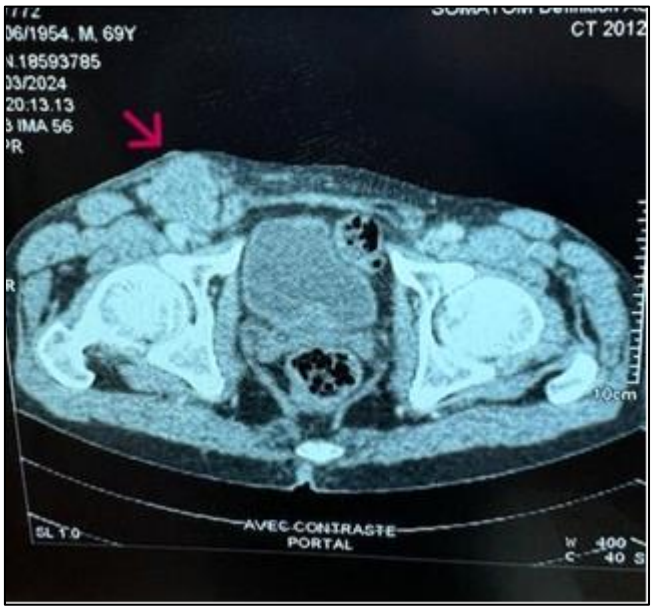

Figure 2b Thoraco-abdomino-pelvic CT scan showing a suspicious right testicular mass associated with a necrotic ipsilateral inguinal lymphadenopathy

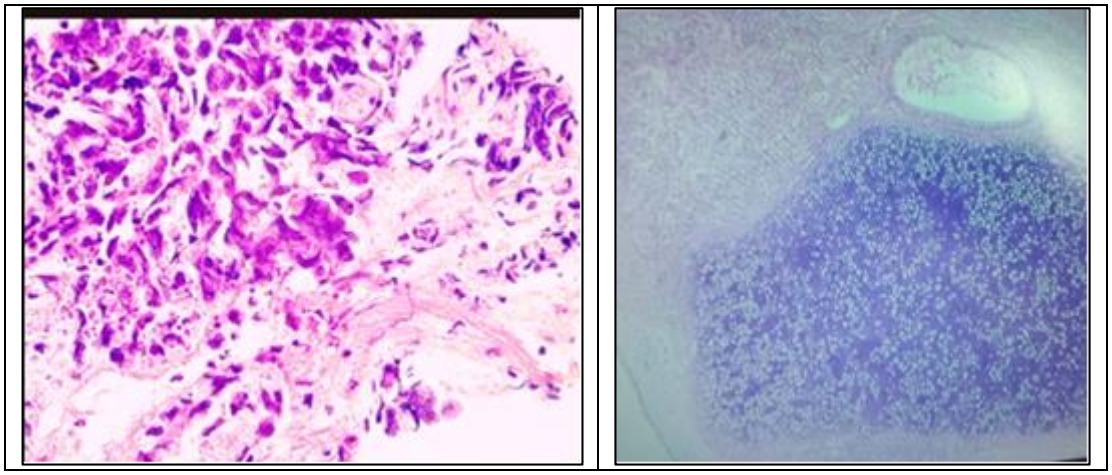

Figure 3 Bronchial biopsy showing a morphological aspect indicative of a metastasis from a germ cell tumor with pulmonary localization

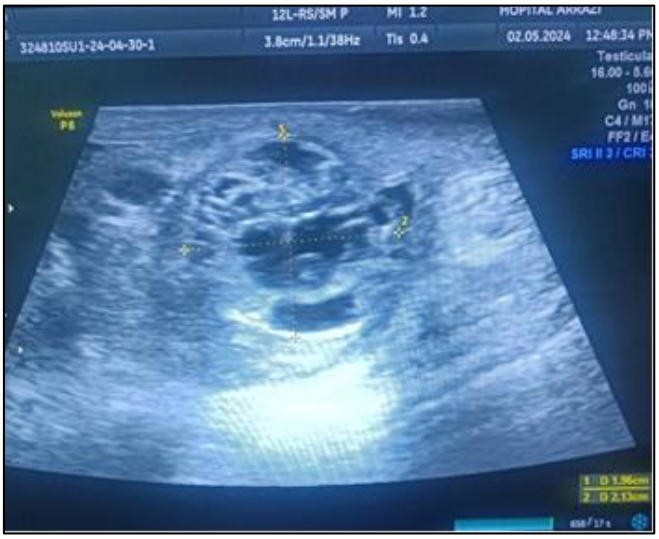

Figure 4 Ultrasound appearance of a heterogeneous hypoechoic right testicle measuring 5 cm in diameter with a hydrocele

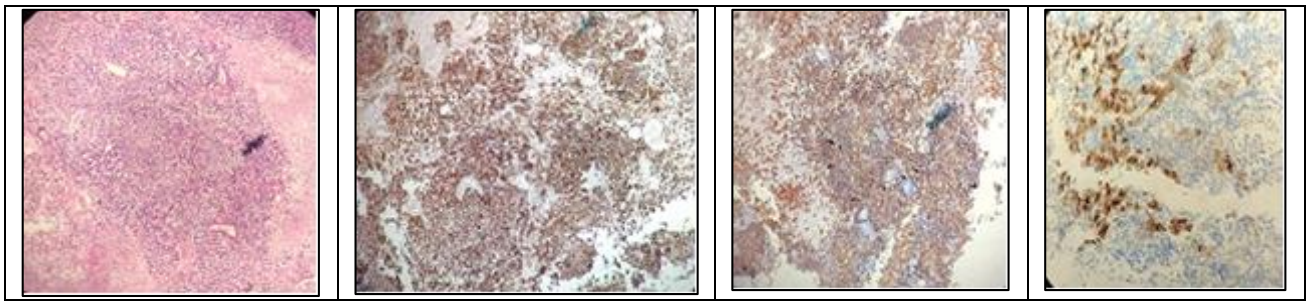

Figure 5 Lymph node biopsy showing a poorly differentiated tumor proliferation with a morphological and immunohistochemical appearance compatible with a yolk sac tumor localization expressing Cytokeratin 7, Vimentin, and Glypican 3

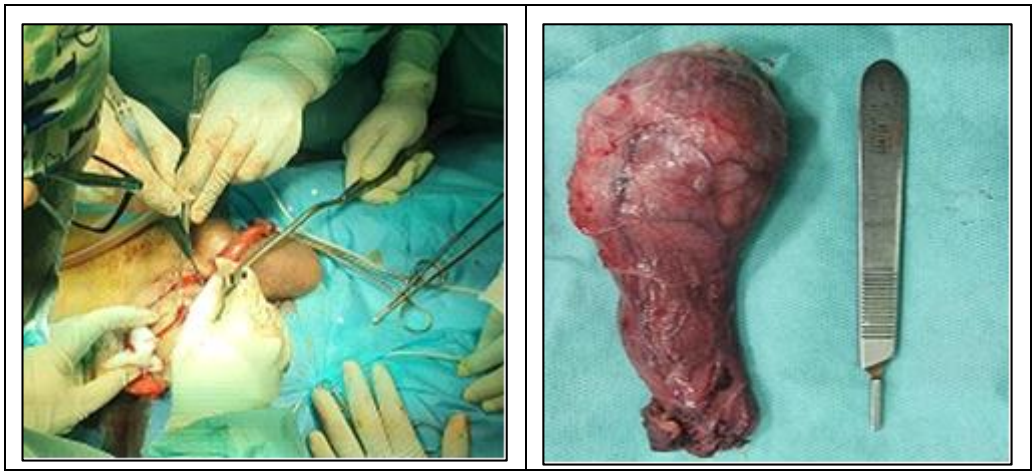

Figure 6 Surgical specimen from inguinal orchidectomy with lymphadenectomy

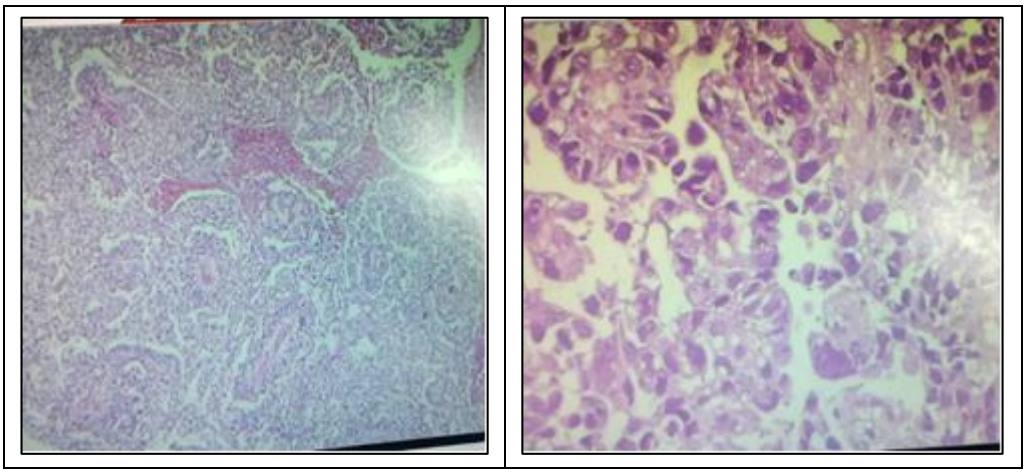

Figure 7a Histological aspect of the surgical specimen showing a yolk sac component at low and high magnification, including Schiller-Duval bodies

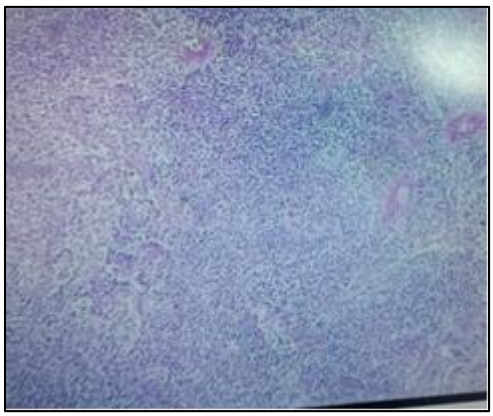

Figure 7b Histological aspect of the surgical specimen showing a neuroblastic component

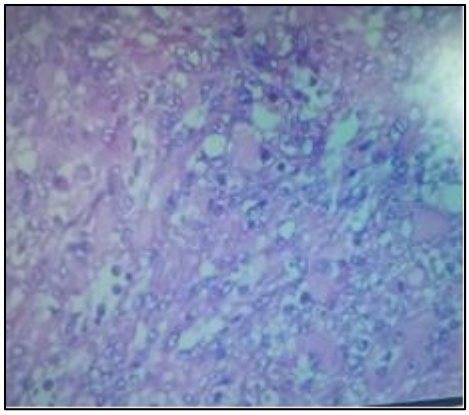

Figure 7c Histological aspect of the surgical specimen showing a rhabdomyosarcomatous component with ependymal rosettes

3. Discussion

Yolk sac tumor is a rare histological variant of non-seminomatous germ cell tumors (NSGCT) in adults. In children under 5 years old, it is present in a mixed form in 2.5% of orchiectomy specimens performed for testicular cancer [3, 4]. The pure form, described in children, remains exceptional in adults. More than 79% of the cases published in adults are associated with other NSGCT components [3, 4]. This tumor, differentiated in the extra-embryonic direction, histologically reproduces the structure of the human yolk sac (rat endodermal sinus) and consistently expresses AFP in immunohistochemistry. However, the elevation of AFP in the blood depends on the pathological stage of the cancer [4, 5]. The diagnosis is histological after orchiectomy, which is always performed via a high approach.

Macroscopically, this often cystic tumor presents with mucoid soft areas [6, 7]. The glandular architecture of this tumor is far from uniform. Loose, cystic, or tubular forms can pose recognition problems. Schiller-Duval bodies (glomeruloid perivascular formations) reproducing typical elements of the endodermal sinus of the placenta, as well as intra- and extracellular eosinophilic globules, are fundamental for this diagnosis. Anisokaryosis is marked, and the cytoplasm is granular, consistently expressing AFP [3, 7].

The therapeutic approach for stage 1 (intratesticular tumor) is still subject to controversy: post-orchiectomy lymph node dissection or surveillance. Orchiectomy is the standard treatment, achieving a cure in 75% of cases [8]. Some authors advocate for immediate lymph node dissection [9, 10, 11], as they find a high number of involved lymph nodes (86% according to Sogani). Furthermore, the presence of vascular invasion and more than 80% embryonal carcinoma component is strongly correlated with a high number of lymph node involvements [12, 11].

However, other authors advocate for close surveillance (αFP + scan), given that lymph nodes are negative after staging dissection in 70% of cases [9, 10], that only 0.5% of them relapse after 24 months, and that chemotherapy allows for a cure [13, 14]. Lymph node dissection is not without risk (anejaculation); it is unilateral to preserve ejaculation by respecting the sympathetic nerves around the L2, L3, and L4 lymph nodes. This is possible when there is no macroscopically visible lymph node involvement; otherwise, it is bilateral. The risk of anejaculation then exceeds 50% [15, 16].

Chemotherapy in stage I is indicated if active tissue persists after orchiectomy or staging dissection (elevated αFP). Different protocols have been used (BEP, COMPE, PVB) with comparable results [17, 14, 18]. Three to four cycles of chemotherapy are used [19, 16]. In stages II or III, chemotherapy is essential, possibly supplemented by dissection if residual masses persist [17, 20]. Yolk sac tumor has a poor prognosis, as it often leads to a high number of tumor recurrences and lymphatic and visceral metastases.

4. Conclusion

Yolk sac tumor of the testis is exceptional in adults. Its prognosis is worse than in children. When discovered at a metastatic stage in adults, it requires aggressive multidisciplinary treatment (dissection + chemotherapy) to prevent the emergence of secondary foci. The progression of this tumor depends on the patient's prognostic group at the time of diagnosis.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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