"Burned out" testicular tumor: Clinical and radiological features

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<td>Authors:</td>
<td>G. Viteri, I. Simon Yarza, R. Saiz-Mendiguren, J. Arias, A. Villanueva Marcos, J. M. Bondia; Pamplona/ES</td>
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Learning objectives

To review the characteristics that define a "Burned out" testicular tumor as well as the more frequent clinical and radiological manifestations.

Background

DEFINITION

The "burned-out" testicular tumor [1] is an uncommon germ cell testicular tumor in which the primary tumor spontaneously and completely regresses. It usually presents in metastatic stage.

EPIDEMIOLOGY

Germ cell tumors are the most frequent malignant tumor in males between 15 and 35 years old. However, only 5% of germ cell tumors are extragonadal and they rarely present without suspicion of a testicular primary [2].

HISTOLOGY

The germ cell tumors can be divided into two main groups, seminomatous and non seminomatous. Both types have been described on "burned out" testicular tumor. It might be a little more frequently associated with seminomatous types [3].

PATHOGENESIS

The mechanism of regression of the primary tumor remains still unknown. The two main hypothesis are the immunological response (T Lymphocites, antibodies) or an ischemic response.

"BURNED OUT" TESTICULAR TUMOR COMPONENTS

1. Extragonadal component [1]
Due to metastatic spread of tumor. There are 2 main manifestations:
A) Retroperitoneal, mediastinal, supraclavicular, cervical or axillary lymph node involvement (Most frequent)
B) Metastatic lesions at liver, lung, brain or other solid organs (Rare)
2. Testicular component [1]

Signs of regression of the primary tumor

A) Fibrous scars
B) Calcifications
C) Necrosis
D) Premalignant lesions: Carcinoma in situ, Intratubular germ cell tumor

DIFFERENTIAL DIAGNOSIS OF THE "BURNED OUT" TESTICULAR TUMOR

The "Burned out" testicular tumor usually manifests clinically and radiologically due to metastatic disease (as the primary tumor has regressed). For these reason the main differential diagnosis is going to be set with a primary extragonadal germ cell tumor.

It is very important to differentiate a "burned out" testicular tumor from a primary extragonadal germ cell tumor because the therapeutic management is going to be different [3].

MANAGEMENT

"Burned out" testicular tumor:

Systemic treatment (Chemotherapy) and local treatment (surgery) [3].

The reason to perform local treatment in the "Burned out" testicular tumor, is that although there may be no actual tumor, there is a high risk of premalignant lesions [4]. As chemotherapy is not going to be effective in the testes due to the presence of the hemato-testicular barrier, local treatment must be performed. In patients with a primary extragonadal germ cell tumor only systemic treatment is needed.

Imaging findings OR Procedure details

The information provided about the clinical and radiological manifestations of the "Burned out" testicular tumor is based on 2 sources:

- A series of 5 patients with "Burned out" testicular tumor collected in our center from 1992 to 2009
CLINICAL MANIFESTATIONS

The clinical symptoms and signs of these entity are going to be mainly related to the metastatic component of the disease, and thus not specific.

Most frequently refered symptoms
- Abdominal pain (60% patients in our series/40% in Fabre’s series)
- Inginal/scrotal pain (40% in our series/20% in Fabre's series)
- Lumbar pain (20% in our series/0% in Fabre’s series)
- Vomiting, weight loss (20% in our series/0% in Fabre’s series)

Most frequent signs on physical examination
- Abdominal mass (20% in our series/20% in Fabre's series)
- Supraclavicular lymphadenopathy (20% in our series/20% in Fabre’s series)
- Testicula abnormalities (20% in our series/0% in Fabre’s series)

It is important to highlight that abnormalities of the testis on the physical examination in patients with "Burned out" testicular tumors are very rare. For this reason, scrotal ultrasonography is vital in order to detect signs of a testicular origin of the tumor.

RADIOLOGICAL MANIFESTATIONS

1. EXTRAGONADAL COMPONENT
It may be detected with many different techniques (US, CT, PET-CT). The diagnosis is usually incidental.

A) Lymph node involvement (Most frequent finding)
Located in retroperitoneum, mediastinum or supraclavicular/cervical/ axillary spaces (Fig. 1 on page 5, Fig. 2 on page 6, Fig. 3 on page 7, Fig. 4 on page 8, Fig. 5 on page 9, Fig. 6 on page 10, Fig. 7 on page 11, Fig. 8 on page 12)

(100% in our series/80% in Fabre’s series)

B) Metastatic lesions of solid organs (Rare)
Located at liver, lung, brain, bone or other solid organs(Fig. 9 on page 13)

(20% in our series/ 0% in Fabre’s series)
2. TESTICULAR COMPONENT
It must always be studied by scrotal ultrasonography (SUS). The objective is to find signs of regression of a primary tumor that confirm the testicular origin of the extragonadal germ cell tumor [2].

**US abnormalities of the testis were present in 100% of the cases in our series and 100% of cases in Fabre’s series.**

**Findings suggestive of primary tumor regression and/or premalignant lesion [5]:**
- **Fibrous scars** (Fig. 10 on page 14, Fig. 11 on page 15, Fig. 12 on page 16)
  
  They are seen as hypoechoic lesions in SUS.

  (60% in our series/ 60% in Fabre's series)

- **Calcifications** (Fig. 13 on page 17, Fig. 14 on page 18, Fig. 15 on page 19, Fig. 16 on page 20)
  
  They are seen as hyperecogenic foci in SUS.

  (100% in our series/ 60% in Fabre's series)

**Images for this section:**
**Fig. 1:** Retroperitoneal mass on US
Fig. 2: Retroperitoneal mass on US
**Fig. 3:** Retroperitoneal mass on unenhanced CT
Fig. 4: Retroperitoneal masses on enhanced CT
Fig. 5: Retroperitoneal mass with calcification on enhanced CT
Fig. 6: Mediastinum mass on enhanced CT
**Fig. 7:** retroperitoneal mass involving the aorta on enhanced CT
Fig. 8: Retroperitoneal mass on PET/CT

Retroperitoneal soft tissue mass with high metabolic intake of $^{18}$FDG.
Fig. 9: Lung Metastases on unenhanced CT
**Fig. 10:** Fibrous scar. Hypoechoic lesion on US
Fig. 11: Fibrous scar: Hypoechoic lesion on US
Fig. 12: Fibrous scar: Hypoechoic lesion with calcifications on US
**Fig. 13:** Cacification: Hyperechogenic focus related to an isolated calcification on US
**Fig. 14:** Cacification: Hyperechogenic foci related to diffuse microcalcifications on US
Fig. 15: Cacification: Hyperechogenic foci related to diffuse microcalcifications on US
**Fig. 16:** Cacification: Hyperechogenic foci related to diffuse microcalcifications on US
Conclusion

When a extragondal germ cell tumor is diagnosed in a male, it is vital to discard a testicular origin.

Scrotal ultrasonography is the key element to rule out the presence of signs of an occult or regressed testicular tumor, as physical examination of the testis does not usually show abnormalities.

When signs of regression of a primary testicular tumor are present, surgical treatment of the testis must be performed due to the high risk of premalignant lesions, and thus, relapsing or developing a metachronous cancer.

Personal Information

References


