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RETROSPECTIVE EVALUATION OF INCIDENCE AND TREATMENT OF TESTICULAR CANCER

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Abstract: *Testicular cancer is a rare type of cancer, accounting for approximately 1–1.1% of male neoplasm. The aim of the paper was to evaluate the prevalence of testicular cancer and the treatment performed in the Emergency County Hospital of Brasov, Clinic of Urology. We conducted a retrospective study over between January 2012 and March 2017. We identified 24 cases of testicular cancer, with an increased incidence between 31 and 40 years old. All patients presented unilateral testicular scrotal mass, 6 patients (25%) accused scrotal pain. Paraclinical, we investigated all patients following the protocol. All patients were treated by radical orchiectomy. We observed an increased incidence, at an alarming rate, in men at reproductive period of life.*

Key words: *testicular cancer, seminoma, βhCG, AFP*.

1. Introduction

Testicular cancer is a rare neoplasm accounting for approximately 1–1.1% of male neoplasm and 5% of urological tumors, affecting mainly younger men in the 3rd or 4rd decade of life [7], [9], [16].

Over the last years, several studies tried to discover the factors associated with the development and promotion of this pathology. Until now, there are established only few risk factors for testicular cancer, most notably cryptorchidism and age. However, the etiology of testicular cancer remains unknown, even if its incidence has been increasing during the last decades especially in the industrialized countries [13,14]. The testicular cancer can be classified in 3 categories: germ cell tumors, cord stromal tumors and miscellaneous germ cell/sex cord stromal tumors [1].

2. Objectives

The aim of the study was to evaluate the prevalence of testicular cancer, the correlation between tumor markers and histopathological result and the treatment of this affection in the Emergency County Hospital of Brasov, Clinic of Urology.

3. Material and Method

We conducted a retrospective study with a total of 24 cases of testicular cancer distributed between January 2012 and March 2017. We obtained the data from the medical records. Statistical and graphical data processing was performed with MS Excel 2016.

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4. Results and Discussions

Between January 2012 and March 2017, 24 cases of testicular cancer were identified in our clinic, with age ranging from 21 to 75 years old (Figure 1). We observed an increased incidence between 31 and 40 years old (14 cases), with a lower risk at the patients under 25 years (1 case) and over 60 years (1 case).

The incidence of testicular cancer has been increasing during the last decades with a large variation in risk among different racial and ethnic groups and in different countries [4], [6], [22].

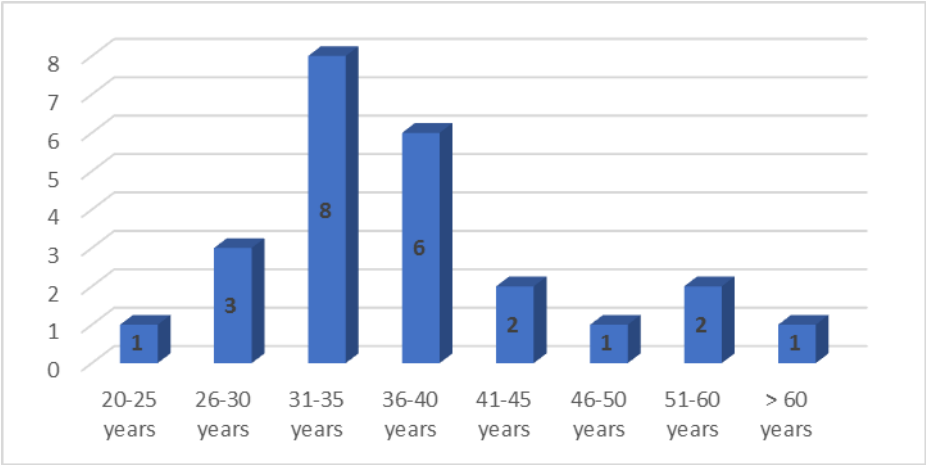


Fig. 1. *Distribution of the pathology by age*

The distribution of the cases of testicular cancer included in this study was the following: 4 cases identified in the year 2012, 3 cases in the year 2013, in 2014 we observed 3 cases, 4 cases in 2015 and 6 cases in the year 2016. The number of cases are increasing dramatically, considering that in the year 2017 there are already 4 cases diagnosed in the first trimester. Figure 2 exemplify the distribution by year of the testicular tumor.

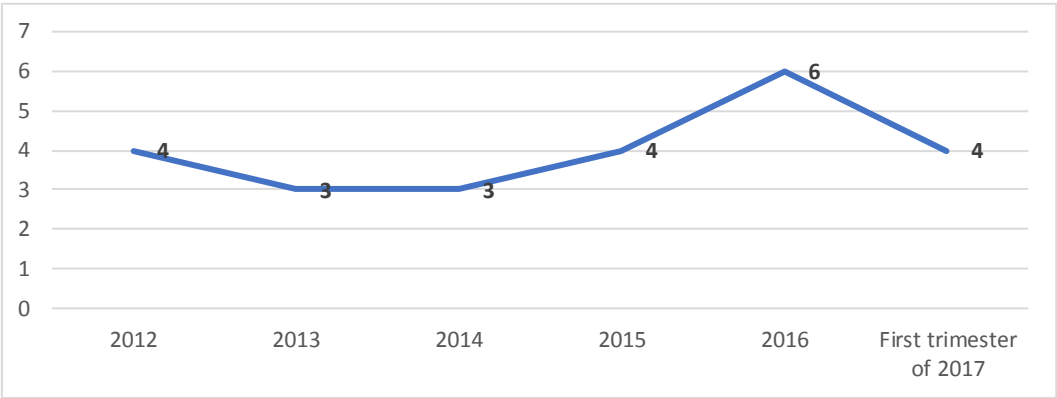


Fig. 2. *Distribution of cases by year*

The demographic data of the patients included in the study is presented in Figure 3. The mainly residence settlement was urban (58,33%), mainly because of the possibility of easier presentation at the urologist. An important risk factor was considered the industrialized areas where patients have their habitat.

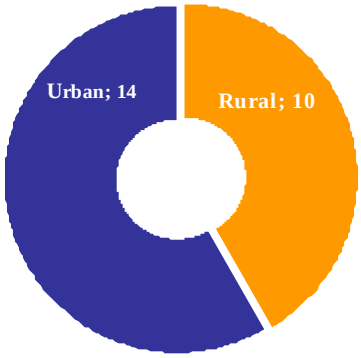


Fig. 3. *Distribution of the cases according to the residence area*

Epidemiological risk factors for developing testicular tumors are components of the testicular dysgenesis syndrome: cryptorchidism, hypospadias, infertility [15], [17,18], the familial history of testicular cancer and the presence of a contralateral tumor [3,11,23]. The clinical findings in the cases from our study are exemplified in Table 1. We investigated the reason for presentation at the urologist. All patients presented unilateral testicular scrotal mass, 6 patients (25%) accused scrotal pain, 2 patients (8,33%) gynecomastia and 2 patients (8,33%) accused back and flank pain.

Moul et al concluded that scrotal pain may be the first symptom in approximately 20% of cases, being present in 27% of patients with testicular neoplasia [20]. Another symptom was gynecomastia, that seems to appear in 20% of cases, being more common in non-seminomatous tumors. In the advanced cases due to metastasis, back and flank pain can be present in about 11% of cases, according to the same study [20]. Because the testicular tumor can mimic orchioepididymitis, the diagnosis is delayed in around 10% of cases. At the clinical examination, testicular cancer presents as a unilateral testicular scrotal mass, painless, revealed by a scrotal trauma or by ultrasonography [10].

Signs and symptoms Table 1

Symptoms	No of patients	%
Unilateral testicular scrotal mass	16	66.67%
Unilateral testicular scrotal mass + scrotal pain	6	25%
Unilateral testicular scrotal mass + gynecomastia	2	8.33%
Back and flank pain	2	8.33%

We investigated all patients with paraclinical tests, following the protocol (Table 2), using Alpha fetoprotein (AFP), Beta hCG (βhCG), LDH, CT scan and testicular ultrasound.

We identified normal values of the AFP (25%) and βhCG < 5000UI/L linked with 6 cases of seminoma, along with 15 cases (62,5%) that had AFP <1000ng/ml and βhCG < 5000UI/L divided in 3 cases of embryonal carcinoma, 3 cases of seminoma with embryonal carcinoma, 3 cases of teratoma with embryonal carcinoma and 6 cases of seminoma with teratoma, staging them in the good-prognosis group.

We also identified 3 cases (12,5%) with AFP between 1000 – 10000ng/ml, and βhCG between 5000 – 50000, as being part of the intermediate-prognosis group, 2 of them (8,33%) associating teratoma and one seminoma with teratoma and embryonal carcinoma, according to the Prognostic Based Staging system [1]. Regarding the βhCG levels we identified in our study 21 cases (87,5%) with a value of <5000 IU/l, and 3 cases (12,5%) with values between 5000-50000 IU/. The LDH levels identified 22 cases (91,66%) with values < 1,5 x ULN, and 2 cases (8,33%) with values between 1,5-10 x ULN.

Paraclinical tests Table 2

Paraclinical exams	**Value**	**No of patients (%)**	**Histopathological result**
AFP	Normal	6 (25%)	6 cases of seminoma
	< 1000 ng/ml	15 (62.5%)	3 cases of embryonal carcinoma; 3 cases of seminoma with embryonal carcinoma; 3 cases of teratoma with embryonal carcinoma; 6 cases of seminoma with teratoma
	1000-10000 ng/ml	3 (12.5%)	2 cases of teratoma and one case of seminoma with teratoma and embryonal carcinoma
βhCG	<5000 UI/L	21 (87.5%)	
Paraclinical exams	5000-50000 UI/l	3 (12.5%)	
LDH	< 1.5 x ULN	22 (91.66%)	
CT scan and Ultrasound	1.5-10 x ULN	2 (8.33%)	
	24 (100%)		

Serum tumor markers are important in the diagnosis of testicular cancer. *Albers et al* [1] concluded that the serum tumor markers contribute to diagnosis and staging, being prognostic factors. The markers should be determined before and 5-7 days after orchiectomy. Tumor markers are valuable for diagnosis before orchiectomy and for prognosis after orchiectomy.

The serum markers that must be investigated at the patients with testicular cancer are: alfa fetoprotein (produced by yolk sac cells), human chorionic gonadotrophin as an expression of trophoblasts and lactate dehydrogenase. In a study from 2010 [2] is observed that AFP and βhCG are increased in 50-70% of patients with non-seminomatous germ cell tumor. The authors also concluded that LDH concentration is proportional to the tumor volume, with an elevated level in 80% of patients with advanced testicular cancer [2], [6], [12].

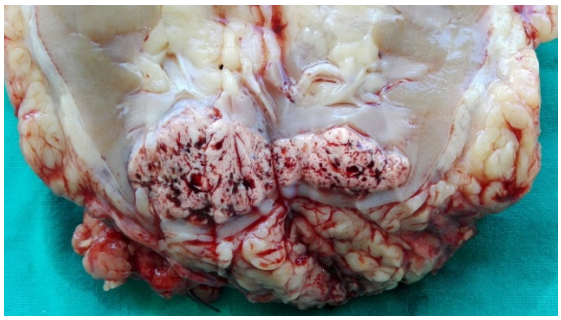
CT scan and ultrasound was performed

in all cases to confirm the testicular mass, to explore the contralateral testicle and also to determine other metastasis. We identified unilateral scrotal mass at all patients and one case associated hydrocele and contralateral scrotal mass.

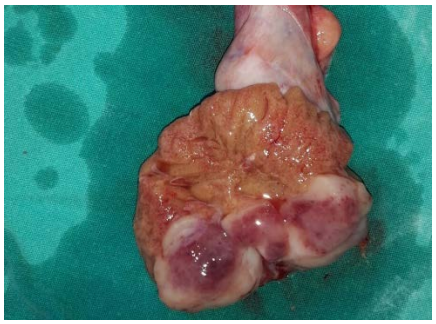
The imaging tests for tumor masses of the testis are imperative to use for a correct diagnosis for all patients with an intrascrotal mass. Currently, the most used imaging test is the ultrasonography, that confirms the presence of a testicular tumor and helps to explore the contralateral testis. Being an inexpensive test, with sensitivity of almost 100%, it has an important role in determining if a mass is intra- or extra testicular [5].

All patients received surgical treatment in our clinic, consisted in radical orchiectomy (inguinal approach) with an accurate histopathological result (testicle and sperm cord piece). For every patient with a suspected testicular tumor it should be performed an inguinal exploration with the exteriorization of the testis within its tunics. The orchiectomy with division of the spermatic cord at the internal inguinal ring must be performed as surgical treatment, followed by testicular biopsy for histological examination. In advanced cases, chemotherapy should be indicated, especially when the clinical exam is suggesting testicular cancer [13].

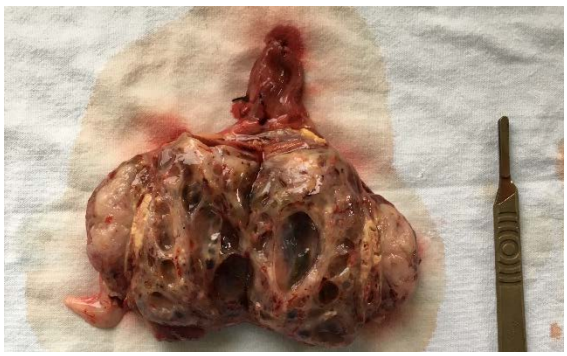
In figure 4 are presented a series of samples from the surgical intervention (radical orchiectomy).



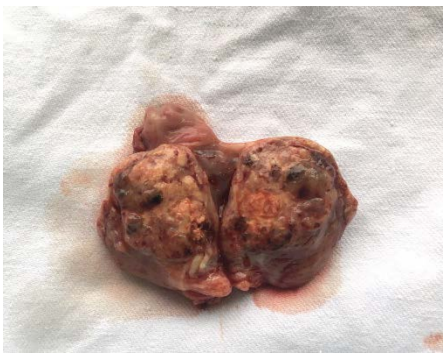
a) *Surgical sample from patient of 33 years of age with mixed germ cell tumor: teratoma with embryonal carcinoma*



b) *Surgical sample from patient of 39 years of age with pure seminoma*



c) *Surgical sample from patient of 47 years of age with teratoma and seminoma*



d) *Surgical sample from patient of 21 years of age with embryonal carcinoma*

Fig. 4.

The histopathological exam results from the samples identified Germ cell carcinoma in all cases, as following: 13 cases (54,16%) of mixed germ cell carcinoma tumors divided in one case of seminoma with teratoma and embryonal carcinoma, 3 cases of teratoma with embryonal carcinoma, 3 cases of seminoma with embryonal carcinoma and 6 cases of seminoma with teratoma (Figure 5).

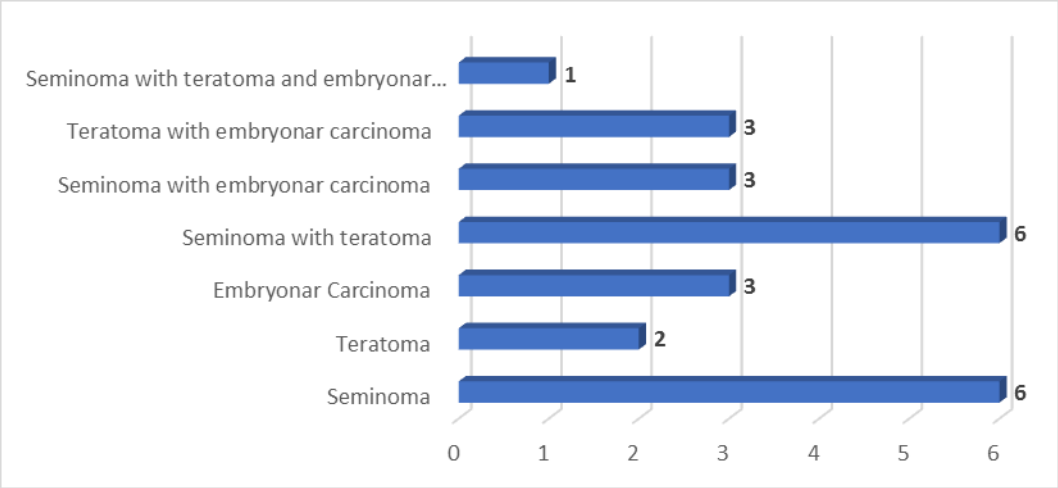


Fig. 5. *Distribution of the cases according to the histopathological results*

In 11 cases (45,83%) it was identified only one type of germ cell carcinoma tumor, 6 cases of pure seminoma, 3 cases of embryonal carcinoma and 2 cases of teratoma.

Chia et al. [6] observed that the median age at seminoma diagnosis was 35–39 years and for nonseminoma 25–29 years. Although seminomas and nonseminomas have different clinical characteristics, studies have revealed similar trends in incidence in most countries, which may indicate that both types share common etiologic risk factors [4,19]. The same study concluded that germ cell tumors account for approximately 98% of testicular cancers [6]. The International Agency for Research on Cancer (IARC) recognizes histologically 4 specific types of germ-cell tumors: seminomas, embryonal carcinomas, malignant teratomas and choriocarcinomas [8]. These lesions can be combined into 2 groups: seminomas and nonseminomas. The nonseminomas tumors represent frequently tumors of mixed histology and may include a variety of seminoma or nonseminoma histologic subtypes [21]. *Mosharafa et al* pointed out in his research that it exists a strong association between teratomas and yolk sac tumors [19]. It is very important to know the classification of the testicular cancer, being well known that the germ cell tumors account of approximately 98 % of testicular cancers.

6. Conclusion

Testicular tumors are very rare, but nowadays, because of the environmental factors is constantly increasing. There are several serum markers that can be investigated in case of testicular mass such as: AFP, βhCG and LDH along with the imaging methods (CT scan and

ultrasound). The urological treatment followed the indicated protocol and consisted in radical orchiectomy (inguinal approach) for an accurate histopathological result. We identified only germ cell tumors either mixed or individual. We observed an increased incidence, at an alarming rate, in men at reproductive period of life which affects their possibility of having a family.

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