Testicular cancer: experience at the Centro Médico del Instituto de Seguridad Social del Estado de México y Municipios (ISSEMyM)

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ABSTRACT

Introduction: Testicular cancer makes up 1-1.5% of tumors in men and 5% of urological tumors. There are three to six new cases per 100,000 men per year in the United States and 5% of cases are bilateral. According to the Mexican Malignant Tumor Histopathological Register (2001), testicular cancer is the most curable solid tumor, and after prostate cancer is the most frequent urological tumor in men in general, and the most frequent urological tumor in working-age men. The present study analyzes the results of an initial series of testicular cancer patients treated at the Urology Department of the Centro Médico del Instituto de Seguridad Social del Estado de México y Municipios (ISSEMyM).

Objective: To present the experience of the authors’ department in testicular cancer management.

Methods: Case records were reviewed of patients with histopathological diagnosis corroborating testicular cancer within the time frame of November 2004 to July 2010 at the authors’ department. The factors that were analyzed were age at the time of diagnosis, genetic load for testicular cancer, and risk factors such as cryptorchidism. Each patient was evaluated by means of complete physical examination and basic laboratory and

RESUMEN

Introducción: El cáncer testicular constituye de 1% a 1.5% de las neoplasias en el hombre; corresponde a 5% de los tumores urológicos. Se presentan de tres a seis nuevos casos por cada 100 000 hombres por año en EUA y 5% de los casos es bilateral. En nuestro país, con base en el registro histopatológico de las neoplasias malignas (2001), el cáncer testicular representa el tumor sólido más curable, siendo después del cáncer de próstata la neoplasia urológica más frecuente en el hombre en general y la neoplasia urológica más frecuente en el hombre en edad laboral. En este trabajo efectuamos un análisis de los resultados de la serie inicial de pacientes con diagnóstico de cáncer testicular tratados en el servicio de Urología del Centro Médico del Instituto de Seguridad Social del Estado de México y Municipios (ISSEMyM).

Objetivo: Presentar la experiencia de nuestro servicio en el manejo del cáncer testicular.

Métodos: Se revisaron expedientes de enfermos con diagnóstico histopatológico de cáncer testicular durante el periodo comprendido de noviembre de 2004 a julio de 2010 en nuestro servicio. Se analizaron factores como: edad al momento del diagnóstico, factores de riesgo, carga genética para cáncer testicular, factores de riesgo...
Histologically, 95% of cases correspond to germ cell tumors. Testicular cancer presents more frequently in white men, with a 10:1 ratio when compared with black men. Greater frequency has been observed in professionals and there is greater incidence in twins and brothers. The 2-3% incidence of bilateral tumors suggests a genetic component and there is a marked predominance in the right testis. Histologically, 95% of cases correspond to germ cell tumors. Testicular cancer presents more frequently in white men, with a 10:1 ratio when compared with black men. Greater frequency has been observed in professionals and there is greater incidence in twins and brothers. The 2-3% incidence of bilateral tumors suggests a genetic component and there is a marked predominance in the right testis.

Key words: Testicular cancer, testicular tumors, Mexico.

Palabras clave: Cáncer testicular, tumores testiculares, México.

INTRODUCTION

Testicular cancer makes up 1-1.5% of tumors in men and corresponds to 5% of urological tumors. There are 3-6 new cases per 100,000 men each year in the U.S. and 5% of cases are bilateral. According to the Mexican Malignant Tumor Histopathological Register (2001), testicular cancer represents the most curable solid tumor, and after prostate cancer, is the most frequent urological tumor in men in general and is the most frequent urological tumor in working-age men. Histologically, 95% of cases correspond to germ cell tumors. Testicular cancer presents more frequently in white men, with a 10:1 ratio when compared with black men. Greater frequency has been observed in professionals and there is greater incidence in twins and brothers. The 2-3% incidence of bilateral tumors suggests a genetic component and there is a marked predominance in the right testis.

Histologically, 95% of cases correspond to germ cell tumors. Two testicular ultrasound, chest film for evaluating metastasis to the thorax, and abdominopelvic computed tomography scan with and without contrast medium principally to rule out retroperitoneal metastatic disease.

Results: A total of thirty-six case records were reviewed, only thirty of which were complete and had adequate postoperative follow-up. Mean age of patients was 34.5 years with a 17-54 year range. Two patients (6.6%) had positive genetic load for cancer. Sixteen patients (52.8%) had cancer in the right testis and fourteen patients (47.2%) presented with left testicular disease. All patients underwent radical orchiectomy. Patient follow-up was from two months to five years and eight months and up to the present there have been no documented deaths from the disease in these patients.

Conclusions: The Centro Médico del Instituto de Seguridad Social del Estado de México y Municipios has had excellent results in the management of patients presenting with testicular cancer as well as in the majority of genitourinary tract diseases, which has been reflected in the marked reduction in morbidity and mortality of these patients.

Conclusiones: En el Centro Médico del Instituto de Seguridad Social del Estado de México y Municipios se cuenta con excelentes resultados en el manejo de pacientes con cáncer testicular así como en la mayoría de las patologías que afectan el tracto genitourinario, lo cual se refleja en la franca disminución en la morbi-mortalidad de los pacientes.
pure choriocarcinoma, and 60% of cases are mixed germ cell tumors.1

The following factors have been related to higher testicular cancer incidence: history of cryptorchidism in 7-10% of patients with testicular tumor, 5-10% men with history of cryptorchidism develop tumor in the contralateral gonad,3,4 genetic alterations such as chromosome 12 anomalies and suppressor gene p53 and p16 alterations. There are also acquired causes such as exposure to hormones (contraceptives), with a 2.8-5.3% during gestation, and atrophy in patients having presented with parotitis during adolescence. Tumors have been discovered during study protocol when treating traumatisms, rather than from a causal etiology.5

Testicular tumors are currently considered to be the most curable solid tumors and the paradigm for polymodal tumor treatment.

Before 1970, mortality was higher than 50% and in 1997 it was under 5%. This is partially due to its association with specific serum markers such as beta human chorionic gonadotropin (β-hCG) and alpha-fetoprotein (AFP), which have enabled adequate follow-up and earlier intervention in the course of the disease.5 Among the other characteristics favoring adequate therapeutic management is the fact that these tumors arise from germ cells which are usually sensitive to radiotherapy and a wide variety of chemotherapy agents; their capacity to differentiate into more benign equivalents from a histological perspective; their rapid growth rate; their systematic extension pattern; and their presence in young individuals with no associated disease who can tolerate polymodal treatment.5,6

The present study analyzed the results of an initial series of patients diagnosed with testicular cancer treated at the Urology Service of the Centro Médico del Instituto de Seguridad Social del Estado de México y Municipios (ISSEMyM).

**METHODS**

The case records were reviewed of patients with histopathologically corroborated diagnosis of testicular cancer within the time frame of July 2004 to July 2010 at the authors’ urology service. The variables analyzed were: age at time of diagnosis, genetic burden for testicular cancer, and risk factors such as cryptorchidism. Evaluation of each patient included complete physical examination, and basic laboratory and radiological work-up: full blood count, blood chemistry, coagulation tests, serum -hCG, AFP, and lactate dehydrogenase (LDH); testicular ultrasound, chest film, and abdominopelvic computed tomography (CT) scan with and without contrast medium. Histopathological report and tumor stage were included for each patient. Staging was carried out based on the 1999 American Joint Committee on Cancer (AJCC) and the International Union Against Cancer (UICC) staging systems. The Tumor-Regional Lymph Nodes- Distant Metastasis- Serum Tumor Markers staging system (TNMS) of the AJCC subclasses the disease in stages, enabling the establishment of prognostic criteria and treatment.

Follow-up entailed visits every three months for the first postoperative year that included physical examination, -hCG, AFP, and LDH tumor marker determination, chest film, and abdominopelvic CT scan with and without contrast medium.

Residual disease was determined when patients presented with: 1) positive surgical margins, 2) tomographic or radiographic evidence of retroperitoneal tumor activity, and 3) persistently elevated serum tumor marker values after orchiectomy.

**RESULTS**

A total of 36 case records were reviewed of which 30 were included in the study because they were complete and had adequate postoperative follow-up. Mean age of patients was 34.5 years with a range of 17-54 years (Image 1). Two of the study patients (6.6%) had positive genetic burden for testicular cancer (one patient’s father and the other patient’s uncle and brother) while the remaining 93.4% stated they had no positive genetic burden (Image 2).

Important past medical history included smoking in 42.9% of cases. Two patients (6.6%) had undergone orchiopexy in infancy (Image 3), the affected testis was the one that had developed tumor, and recurrence in contralateral testis was not documented. Bilaterality was documented in only 1 patient (3.3%) and was metachronic with an approximate 24-month interval (Image 4). Twenty-four diagnosed patients (79.2%) had medical consultation for testicular volume increase, 2 patients (6.6%) were diagnosed during testicular trauma protocol, and 1 (3.3%) due to ultrasound findings during infertility protocol. One patient was admitted to the emergency room with acute abdomen. During surgical exploratory examination abdominal testis with spermatic cord with areas of necrosis was found. No other acute abdomen focus was documented and histopathological study reported 5.5 cm classic seminoma (Image 5).

There was disease predominance in the right testis, with 16 cases (52.8%), and 14 cases (47.2%) of disease in the left testis (Image 6). All patients underwent radical orchiectomy, with inguinal approach in 29 patients (96.6%) and abdominal approach in the one patient who had undergone laparotomy for acute abdomen.
The most frequent histology was classic pure seminoma in 20 patients (66.6%), 1 patient (3.3%) had mature teratoma, and 1 patient (3.3%) had pure yolk sac tumor (Image 7). Eight patients (26.6%) had mixed germ cell tumors. In order of frequency, 6 (75%) were seminoma, 5 (62.5%) yolk sac tumor, 4 (50%) embryonal carcinoma, 4 (50%) mature teratoma, and 3 choriocarcinoma (37.5%).

Vascular lymphatic permeation was observed in 2 patients (6.6%) with seminoma and in 1 patient (3.3%) with mixed germ cell tumor. All three were classified as stage T2 (TNMS) (Image 8). The rest of the patients were classified as T1 (TNMS).

There was retroperitoneal lymphatic tumor activity in 5 patients. One (3.3%) of them had a paracaval lymph node under 2 cm (N1 according to TNMS), 2 patients (6.6%) had retroperitoneal nodes from 2-5 cm (N2 according to TNMS), and 2 patients (6.6%) had retroperitoneal nodes larger than 5 cm (N3 according to TNMS) (Image 9). Distant metastasis was not documented in the study patients (M0 according to TNMS). Six cases were classified as stage S1 (TNMS); 1 due to elevated fraction -hCG, 1 due to elevated AFP, and 4 due to elevated LDH (Image 10).

This enabled the classification of 21 patients (69.9%) as stage Ia, 1 patient (3.3%) as stage Is, 1 patient (3.3%) as stage Ila, 2 patients (6.6%) as stage IIb, and 2 patients (6.6%) as IIC. Up to the present, no patients have been documented with distant metastasis or as stage III (Image 11).

Seven patients (4 seminomatous germ cell tumor [SGCT] and 3 nonseminomatous germ cell tumor [NSGCT]) were sent to receive adjuvant chemotherapy; 5 (16.6) had evidence of retroperitoneal disease, one of them with spermatic cord invasion (T3) and two others with vascular lymphatic permeation (T2) and persistently elevated tumor markers after orchiectomy (Image 12).
Follow-up of these patients has been from 2 months to 5 years and 8 months, and up to the present time no deaths from this disease have been documented.

**DISCUSSION**

The results observed in the present study correlate the marked prevalence of testicular tumors in late adolescence and the first stages of adulthood (20-40 years). There are studies that show a higher incidence of testicular tumor in twins, brothers, and members of the same family, as pointed out by Johnson in 1976; this factor was only associated in 6.6% of patients in the present study.7

Past history of cryptorchidism was observed in 2 patients (6.6%), similar to that shown in the bibliography (7-10% by Whitaker, 1970).8 There was a slight predominance of disease in the right testis with 52%. Authors such as a Sokal et al in 1980, reported bilaterality in 1-2.8% of cases, and it was observed in only 1 patient (3.3%) in the present study.9

In the present study, prevalence by histological type was very similar to that reported by Mostofi et al and standardized in 1988 by the World Health Organization (WHO) that showed higher incidence of seminomatus tumors.10 In 1973 Mostofi classified more than 6000 testicular tumors and found more than one histological pattern in 60%. In the present study this association was 26.6%.10

As demonstrated in many studies, radical orchiectomy is the procedure for definitive anatomopathological diagnosis and treatment of testicular tumors; morbidity
is minimal and there is nearly zero mortality, and disease control is 100%.

**CONCLUSIONS**

Testicular cancer is currently considered to be one of the most curable solid tumors in men. In part, this is due to its association with specific serum markers that have enabled adequate follow-up and earlier intervention during the course of the disease. Other characteristics also favor its adequate therapeutic management, such as its germ cell origin - cells that tend to be sensitive to radiotherapy and a wide variety of chemotherapy agents, its capacity to differentiate into more benign equivalents from a histological viewpoint, its rapid growth rate, systematic extension pattern, and its presence in youths with no associated disease who can tolerate polymodal treatment.

There have been excellent results at the Centro Médico del ISSEMyM in the management of patients presenting with testicular cancer as well as in the majority of pathologies affecting the genitourinary tract, which is reflected in a marked reduction in patient morbidity and mortality.

**BIBLIOGRAPHY**


