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Mixed Germ Cell Tumor of Testis with Polyembryoma: A rare entity

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Abstract:

We report a case of 22 year old male with right testicular swelling having high serum levels of AFP, LDH and HCG. Orchidectomy was done and specimen was sent for histological examination. On examination revealed mixed germ cell tumor with predominant component of teratocarcinoma (45%) with foci of yolk sac tumor (25%), embryonal carcinoma and polyembryoma. Other areas of testis showed areas of necrosis, and inflammation. No evidence of peritumoral lymphovascular invasion identified. He was sent for chemotherapy and his levels of HCG and AFP have come down to normal after 6 months of treatment.

Keywords: Testicular mixed germ cell tumor, Polyembryoma, Teratoma, Yolk sac tumor.

Introduction

Worldwide testicular germ cell tumors (TGCTs) account for only 1% of all male cancers. They are mainly two types: seminomas and non-seminomas, constituting more than 90% of all type of germ cell tumors (GCTs). Testicular germ cell tumors are the most common cancers among white men between puberty and their forties in industrialist countries. The overall worldwide incidence is increased over the past years by more than doubling in American and European countries. Age of distribution is between 25 years to 35 years. The large differences in incidence among different ethinic groups are attribute to genetic susceptibility, geographic variation and environmental factors.[1] Non-seminomatous germ cell tumors (NSGCTs) include teratoma, embryonal carcinoma (EC), choriocarcinoma, yolk sac tumour (YST) and mixed germ cell tumour (MGCT).[2]MGCTs are malignant tumours consisting of more than one GCT component. All are clinically regarded as non-seminoma, regardless of presence or absence of a seminoma component. Most common combination includes EC with teratoma, seminoma or YST but any combination can be seen. The combination of EC and YST are common.[1]MGCT with polyembryomatous component can also occur. Pure

form of polyembryoma is extremely rare among testicular germ cell tumor.[3]

In the literature, there is only very few number of studies evaluating the tumour components of MGCTs.[2] Here we presents a case report of MGCT with polyembryoma component.

Case Report

A 22-year-old male presented to surgery outpatient department with the history of undescended right testis. On examination, right testis was enlarged firm to hard in consistency and was present in inguinal canal. Overlying skin was normal. Clinically, provisional diagnosis of testis tumour was made. Ultrasonography revealed an enlarged right testis measuring 12x10x9 cm and consisting of solid and cystic areas with small foci of necrosis. Contralateral testis appeared to be normal. The alpha fetoprotein levels were 637 ng/ml (normal range: <8.1 ng/ml). His B-HCG and LDH levels were elevated at 4727 mIU/ml and 420 U/L, respectively. A right high orchidectomy was carried out and the specimen was sent for histopathology. On gross examination, testis was round to oval with attached skin and spermatic cord measured 15x11x10 cm. overlying skin which measured 11x7 cm and spermatic cord was approximately 1 cm long. On cut surface, tissue was soft to firm, variegated with multiple cystic areas measuring 0.4 cm indiameter filled with necrotic material. Examination of multiple sections under microscope revealed mixed germ cell tumor with predominant component of teratocarcinoma (45%) with foci of yolk sac (25%), embryonal carcinoma (20%). Few areas showed polyembryoma like structures(10%)(Figure 1 B). Tumour was invading epididymis as well as spermatic cord. Overlying epidermis was free from tumour. Other areas of testis showed areas of necrosis, inflammation and infarction. No evidence of peritumoral lymphovascular invasion identified.

Images

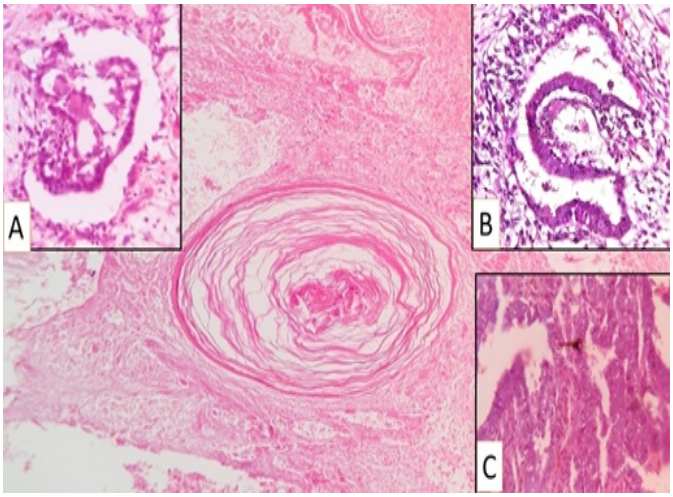

Figure 1: Microphotograph of case of teratocarcinoma showing focal cystic keratin, Shiller- duval body of yolk sac element (1A), component of polyembryoma (1B) and foci of embryonal carcinoma (1C).

Discussion

Testiculat tumors are vastly of germ cell orgin in approximately 95% cases and they constitute 1-2% of all male malignancies. The paramount risk factors including cryptorchidism, testicular dysgenesis, prior testicular germ cell neoplam, family history, genetic factors remain well established in literatures.Typically testicular tumors tends to occur in young men.[1],[4] Germ cell tumours include a group of highly heterogeneous tumours regarding to their clinical and histological appearance. They represent 3% of cancers diagnosed in children and adolescent younger than 15 years. A bimodal age distribution is observed with a small peak during infancy and a larger peak after puberty. Non-seminomateous germ cell tumours are largely predominant as compared to seminomateous tumours, rarely seen before puberty.[5]Embryonal carcinomas are hardly ever seen in early childhood, they occur mostly in 20-30 year age group. Yolk sac tumor is the most

common germ cell testicular tumor in infants and children .In adult pure form of yolk sac tumor is rare; instead it frequently combines with embryonal carcinoma.[6] OCT3/4, NANOG, SOX2 and, most recently LIN28 have been identified as key regulators of pluripotency in embryonic and induced stem cells, are a hallmark of germ cell tumors.A study consist of cell line experiments involving siRNA knockdown of LIN28, OCT3/4 and SOX2 showed that LIN28 plays a role in the maintenance of the undifferentiated state of both seminoma and embryonal carcinoma linked to upstream of OCT3/4 and NANOG.[7]

In the present study, the most common components are embryonal carcinoma, teratoma, and yolksac tumor. According to literature, the most common MGCT combinations are embryonal carcinoma and teratoma, embryonal carcinoma and seminoma, embryonal carcinoma, yolk sac tumor and teratoma, embryonal carcinoma, teratoma and choriocarcinoma, embryonal carcinoma, teratoma and seminoma.[2] Bakaris S etal 2005 also showed teratoma, embryonal carcinoma, yolk sack tumor with polyembryomatous as the most common components.[3]All the observations in these literatures are in concordence with our study.

Polyembryoma is rare component of mixed germ cell tumor seen in both ovary and testis. Only a small number of gonadal tumors with a polyembryoma component have been reported.In both sexes, the microscopic appearance of the tumor is complicated by the presence of ateratomatous component and in some cases by nonteratomatous elements, most often embryonalcarcinoma or yolk-sac tumor but occasionally choriocarcinoma. Histologically shows numerous embryoid bodies surrounded by primitive extra-embryonic mesenchyme. The embryoid bodies may be well differentiated to less differentiate or malformed. Well differentiated embryoid bodies show embryonic disc, amniotic cavity on one side and yolk sac on other side, as shown in our case. Identification of polyembryoma by the pathologist may have several practical points in addition to academic interest prompted by the remarkable morphology. Reporting embryoid bodies in such cases may help and awareness of the morphology will aid identification at extragonadal primary and metastatic sites.[8]

In view of current management protocol it is pivotal to mention the different elements and their percentage for proper management. Even though YST is the most common component in mixed germ cell tumors its variegation in morphology make it tough to diagnose. It has been noticed that YST habitually present in adult testicular tumors and mixed germ cell tumors, the can anticipate to speak out the behavior of tumor except when they are with seminomas. Adult with YST elements in germ cell had increased prevalence for stage I disease.[9]

According to AJCC staging our tumor falls on the Stage group IS: pT1 - 4,X N0M0S1 – 3 (**pT1**: nonpure seminoma confined to testis / tunica albuginea / rete and no lymphovascular invasion (LVI) **S1**: LDH < 1.5 x upper limit of normal, hCG< 5,000 mIU/mL and AFP < 1000 ng/mLand by International germ cell cancer collaborative group our tumor had a good prognosis with 5-year survival rate of 92 % and 5-year progression free survival of 86%.[10].Testicular mixed germ cell tumours and its different proportion of elements and combination had a great role in the diagnosis, treatment and prognosis. In our study the most common component was embryonal carcinoma, yolk sac tumor, and teratoma. Serum markers correlate with histologic observation of a

YST component or trophoblastic cells may indicate the probable utility of certain marker studies. There is a great responsibility on pathologists to examine testicular GCT specimens carefully, with generous sampling, to note the prescence or abscence of lymphovascular invasion, and to categorize and semiquantitate the components of these neoplasm. As a result of therapeutic advances in the treatment of testicular GCTs increased, the need for accurate diagnosis of these lesions has increased.[4]

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