

Testicular mixed cell tumor (Polyembryoma)

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Abstract

Polyembryoma of the testis is a very rare, distinct form of mixed germ cell tumor. We report a case of polyembryoma of testis in a 22-year-old male who presented with right sided scrotal swelling since 4 months associated with loss of appetite and weight. It was a hard painless scrotal swelling. There was no history of administration of testosterone. No gynecomastia or cryptorchidism was noticed clinically. Alpha-Fetoprotein (AFP) and beta-HCG values were found to be abnormal. USG of the scrotum revealed a right sided testicular mass. The CT scan of abdomen and pelvis was normal. The patient underwent right-sided high orchidectomy. Grossly, grey black to yellow enlarged testicular mass measuring 6X4X3 cm, firm to hard in consistency was found. Cut-section revealed a variegated mass of solid and cystic areas with haemorrhage and necrosis. Microscopically, a mixed germ cell tumor with embryonal carcinoma, yolk sac tumor and polyembryoma components was diagnosed. Immunohistochemistry showed immuno-positivity for CD 30, Alfa feto-protein (AFP) and cytokeratin cocktail and negativity for placental alkaline phosphatase (PAP), confirming the diagnosis.

Key-words: Testicular mixed germ cell tumor, polyembryoma, embryonal carcinoma, yolk sac tumor.

Introduction

Testicular cancer is a respectively rare neoplasm; It make up approximately two percent of all malignant cancers in men and account for up to ten percent of all malignant disease occurring within the male genitourinary system. More importantly, testis tumors are the most common malignant disease, developing in men between 20 and 40 years of age and are the third leading cause of death among men of this age group [1]. For unexplained reasons there is a worldwide increase in the incidence of these tumors. In the 15- to 34-year age group, they constitute the most common tumor of men and cause approximately 10% of all cancer deaths[2].

Testicular neoplasms are divided into two major categories: germ cell tumors and sex cord–stromal tumors. Approximately 95% of testicular tumors arise from germ cells. Germ cell tumors are subdivided into seminomatous and non-seminomatous germ-cell tumor (NSGCT) types. The

non-seminomatous tumors may be composed of undifferentiated cells that resemble embryonic stem cells, as in embryonal carcinoma, but can differentiate into various lineages generating yolk sac tumors, choriocarcinomas and teratomas[2].

Mixed germ cell tumors contain more than one germ cell component and are much more common than any of the pure histologic forms representing 32%-60% of all germ cell tumors. The composition of these tumors varies [3]. Here we present a rare case of mixed germ cell tumor composed of yolk sack tumor, embryonal carcinoma and polyembryoma components.

Germ cell tumors may have a single tissue component, but in approximately 60% of cases, contain more than one tumor type: seminoma, embryonal carcinoma, yolk sac tumor, polyembryoma, choriocarcinoma and teratoma. The age of the patient provides a clue to the most likely type of tumor present. Most germ cell tumors occur

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between the ages of 20 and 50 years. Before puberty, seminoma is extremely uncommon, while yolk sac tumor and the better differentiated types of teratoma are the usual germ cell tumors. Spermatocytic seminoma and malignant lymphoma usually occur in older patients, although both may also occur in younger individuals [4]. The polyembryoma is a distinctive, very rare, well-organized form of mixed germ cell tumor consisting of embryonal carcinoma and yolk sac tumor [5].

Case Report

A 22 years old male presented with history of right-sided scrotal swelling since 4 months. It was a right sided painless swelling which was progressively increasing in size. It was associated with history of loss of appetite and weight. No history of administration of testosterone. Physical, systemic examination and vital parameters were normal.

On local examination, a large right -sided scrotal swelling was found. The scrotal skin was normal. Gynaecomastia or cryptorchidism was not seen clinically. Per-abdominal examination did not reveal any abnormality. Virchow's nodes were negative.

Serology was carried out which showed increased levels of serum Alpha-Fetoprotein (AFP): 1805 ng/ml, Beta-HCG: 512 IU/ml. USG of the scrotum revealed a large right sided testicular swelling measuring 6 X 4 X 3 cm consisting of solid and cystic areas. The vasculature was normal. The Chest X-Ray and CT scan of abdomen & pelvis were normal. The patient underwent right-sided high orchidectomy.

On gross pathological examination, a solitary, un-encapsulated grey black to yellow enlarged testicular mass was found measuring 6 X 4 X 3 cm, firm to hard in consistency [Figure. 1(a)]. The cut-section revealed a variegated mass of solid and cystic areas punctuated by foci of haemorrhage and necrosis [Figure. 1(b)]. Histopathology studies showed the tumor was containing mixed components of embryonal carcinoma (EC) and yolk sac tumor (YST)

in almost equal proportions. The EC component was characterized by large anaplastic cells, with hyperchromatic nuclei, prominent nucleoli, amphophilic cytoplasm, indistinct cellular borders & increased atypical mitosis [Figure. 1(d)]. The YST component was characterized by papillary, solid cords, lace like (reticular) network of medium sized cuboidal and elongated cells with small nuclei [Figure. 1(c)]. There are papillary structures with central core & papillary visceral and parietal layers of cells (Schiller-Duval Bodies) [Figure. 2(a)]. There were many scattered areas in which the germ cells were forming embryoid bodies. Extensive tumor necrosis was found. Immunohistochemical studies were performed which exhibited immune-positivity for CD30 emphasizing EC [Figure. 2(c)] and cytokeratin & alpha-feto protein emphasizing yolk sac tumor [Figure. 1d)] and immuno- negativity for and placental alkaline phosphatase. The patient underwent adjuvant chemotherapy and he has survived without any evidence of recurrence or metastasis for last 3 years of follow up.

Discussion

Testicular tumor is a relatively rare neoplasm. It make up approximately two percent of all malignant cancers in men and account for up to ten percent of all malignant disease occurring within the male genitourinary system. Germ cell tumors are divided into two basic groups: seminomas which occur in approximately 40% of the population and non-seminomatous tumors (NSGC) which may be seen in pure or mixed form.

Mixed germ cell tumors contain more than one germ cell component and are much more common than any of the pure histologic forms representing 32%-60% of all germ cell tumors. Minor foci of yolk sac tumor are common, although it is usually overshadowed by other components, such as embryonal carcinoma. The average age of presentation for patients with mixed germ cell tumors is 30 years [5]. AFP is normally synthesized by fetal yolk sac and also the liver and intestine. It is elevated in 50-70% of testicular germ cell tumors and has a serum half-life of 4-5 days [4]. In embryonal carcinoma (EC), the expression of this cytokine

receptor has been demonstrated only by immunohistochemistry. Testicular germ cell tumors with EC differentiation have been described to react with the CD30 antibodies Ki-122 and Ber-H2 [6]. The immunoreactivity of germ cell tumors for PLAP was as follows: 98% of cases with seminomatous elements were PLAP positive. 21% of pure embryonal carcinomas (EC), 25% of EC components in mixed tumors, all yolk sac tumour (YST) components, 20% of pure teratomas (T) and 47% of T components were AFP positive [7]. In EC and YST the immunohistochemical staining depicted characteristic previously unrecognized histological structures, presumably representing patterns of further differentiation [8].

rare form of mixed germ cell tumor composed predominantly of embryoid bodies, is considered by some as a unique germ cell tumor and is listed under one histologic type. However, the individual components consisting of embryonal carcinoma, yolk sac tumor, syncytiotrophoblastic cells and teratoma, suggest that these should be regarded as mixed germ cell tumors with a unique growth pattern [9]. It is perhaps the most photogenic of all gonadal germ cell tumors and is also intriguing because of its distinctive, organized arrangement of yolk sac tumor and embryonal carcinoma elements and recapitulation of very early embryonic development, even to the extent of having in its fundamental unit, the embryoid body, a miniature yolk sac, and amniotic cavity.[9,10].

Polyembryoma, is a separately categorized,

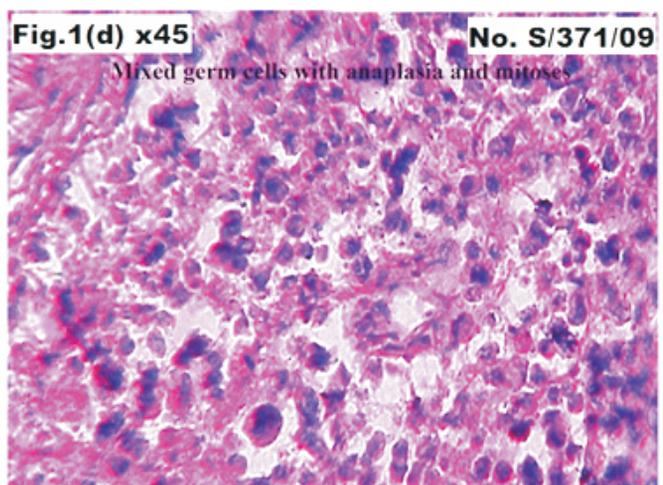
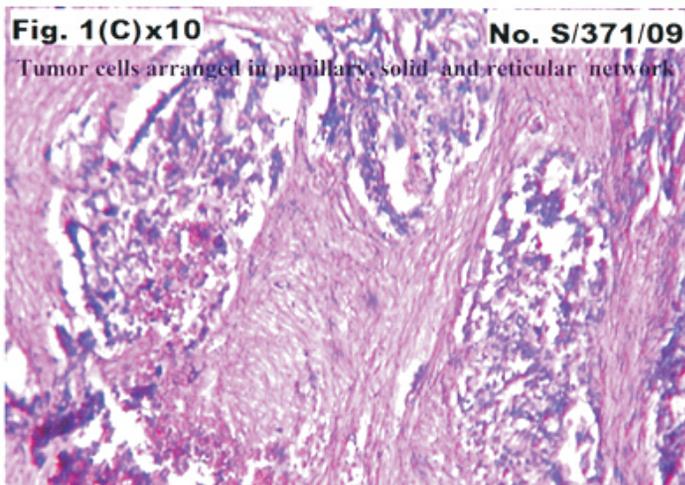
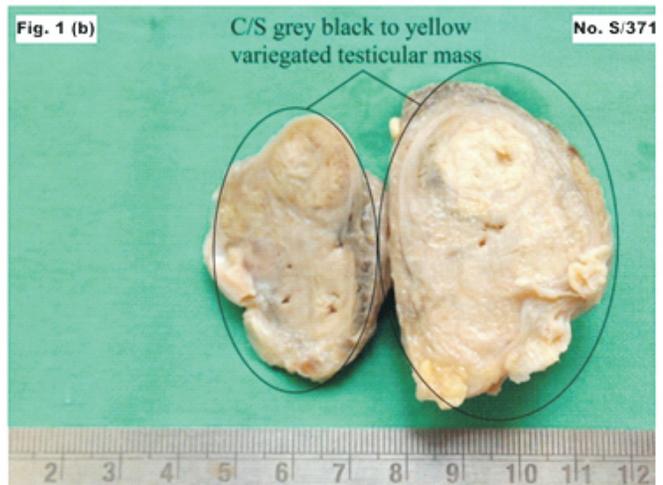
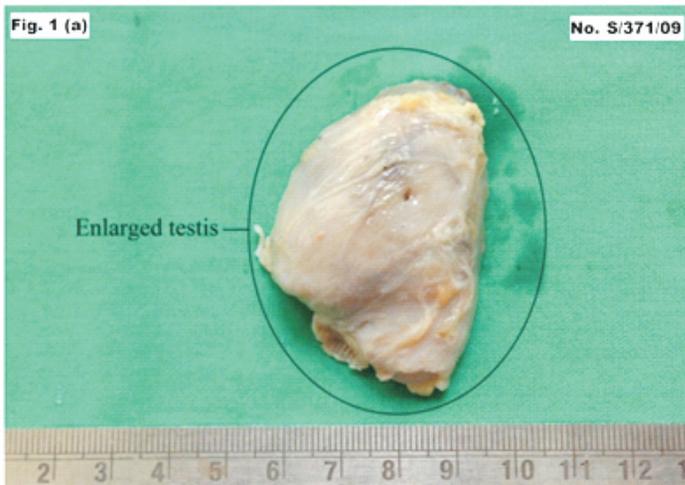


Figure. 1 (a): Grey black to yellow enlarged right testicular mass.

Figure. 1 (b): Cut section shows variegated testicular mass.

Figure. 1 (c): Photomicrograph under H&E stain (x10) tumor cells arranged in papillary and reticular network.

Figure. 1 (d): Photomicrograph under H&E stain (x45) large cells with anaplasia & atypical mitosis.

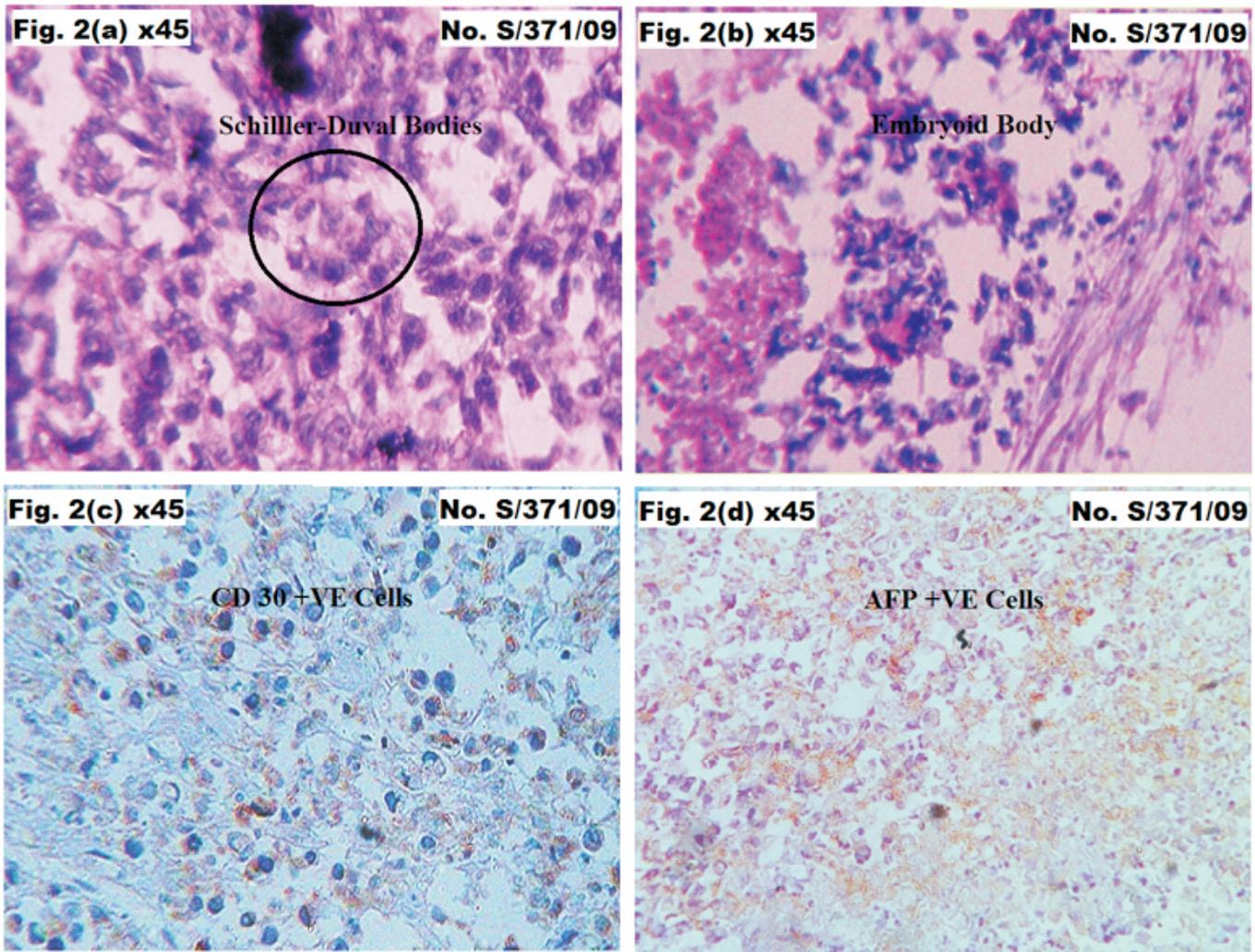


Figure. 2 (a): Photomicrograph under H&E stain (x45) tumor cells arranged in papillary projections with central fibro-vascular core forming Schiller-Duval Bodies.

Figure. 2 (b): Photomicrograph under H&E stain (x45) tumor cells forming embryoid bodies.

Figure. 2 (c): Photomicrograph under IHC stain (x45) CD30 +ve tumor cells.

Figure. 2 (d): Photomicrograph under IHC stain (x45) AFP +ve tumor cells.

Conclusion

Mixed Germ Cell Tumors of the testis are rather rare and most commonly occur in young men. Polyembryoma is a rare variant of MGCT. It continues to be diagnostically challenging issue, as its biological behavior, clinical management and prognosis vary with its different histological elements. Therefore accurate pathological diagnosis is essential and immunohistochemistry plays an important role in the diagnosis and differential diagnosis of various elements of testicular MGCT. In the present case, the immunohistochemistry for CD30, AFP, cytokeratin and placental alkaline phosphatase was helpful to accentuate each GCT component.

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