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Editorial

Callow and Naive-Juvenile Granulosa Cell Tumour Testis

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Abstract

Juvenile granulosa cell tumour is an exceptionally discerned neoplasm engendered from specialized gonadal stromal cells or primitive granulosa cells wherein testicular lesion is preponderantly unilateral and encountered within 6 months of neonatal period. Testicular juvenile granulosa cell tumour is associated with anomalous karyotype or genetic mosaics such as chromosome 45, X/47, XXY, 45X/46 or X.r(Y). Neoplasm is concordant with testicular cryptorchidism or dysgenetic gonads as a component of Drash syndrome. Tumefaction demonstrates solid, nodular or follicular configurations or an admixture of aforesaid patterns. Neoplastic cells are pervaded with moderate to abundant, pale to eosinophilic cytoplasm and spherical to ovoid, hyperchromatic nuclei with significant mitotic activity. Extensive stromal hyalinization is associated with myxoid substance within intervening stroma. Tumour cells are immune reactive to FOXL2, steroidogenic factor 1 (SF1), vimentin, inhibin, calretinin, Wilm's tumour 1 (WT1) antigen and SOX9. Testicular juvenile granulosa cell tumour requires segregation from neoplasms such as yolk sac tumour, teratoma, cystic dysplasia of the testicle, Sertoli cell tumour, gonadoblastoma, unclassified sex cord stromal tumours or testicular rhabdomyosarcoma. Surgical manoeuvers as orchiectomy or intervention techniques as testis sparing surgical modalities appropriately alleviate the neoplasm.

Keywords: Juvenile; Genetic Mosaicism; Gonadal Stromal Cells

Juvenile granulosa cell tumour emerges as an exceptionally discerned neoplasm engendered from primitive granulosa cells. Tumefaction configures as a testicular lesion commonly encountered within 6 months of neonatal period. Notwithstanding, tumefaction is comprehensively observed within first decade of life. The neoplasm demonstrates significant morphological variation with occurrence of distinctive solid and follicular tumour patterns. Characteristically, lobular articulations or follicular differentiation are expounded. Notwithstanding, solid or reticular tumour pattern may be challenging to ascertain. Neoplastic cells appear immune reactive to steroidogenic factor 1 (SF1), calretinin, vimentin and inhibin. Tumour cells appear immune non-reactive to alpha fetoprotein (AFP). Malignant metamorphosis remains undocumented.

Juvenile granulosa cell tumour is an exceptionally encountered tumour which configures < 0.5% of sex cord stromal tumours. Neoplasm commonly incriminates paediatric subjects between 30 weeks of gestation to 10 years wherein a majority (~90%) of lesions occur ≤ 6 months [1,2]. Testicular juvenile granulosa cell tumour is associated with anomalous karyotype or genetic mosaics such as chromosome 45, X/47, XXY, 45X/46 or X.r(Y) [1,2]. Juvenile granulosa cell tumour is concordant with testicular cryptorchidism or dysgenetic gonads configuring a component of Drash syndrome. An estimated 20% subjects depict chromosomal anomalies concurrent with Y chromosome. Exceptionally, neoplasm may concur with subjects demonstrating undescended testes or dysgenetic gonads [1,2]. Testicular juvenile granulosa cell tumour is preponderantly unilateral. Tumefaction is posited to arise from specialized gonadal stromal cells constituting the testicle. Neoplasm recapitulates juvenile granulosa cell tumour of the ovary on morphological grounds [2,3].

Juvenile granulosa cell tumour commonly represents as a testicular tumefaction in ~65% instances or may emerge as an enlarging testis. Testicular tumefaction may be asymptomatic and may represent within abdominal cavity, inguinal region or confined to the scrotal sac. Neoplasm may be devoid of endocrine features. Certain individuals may manifest with clinically normal, undescended contralateral testis [2,3].

Grossly, tumefaction is well circumscribed, cystic, solid or demonstrates an admixture of solid and cystic areas. Cysts appear permeated with watery to mucoid fluid. Tumour magnitude varies from 0.5 centimetres to 5 centimetres with mean tumour diameter of 2 centimetres and median diameter of 1.5 centimetres. Cut surface exhibits a yellow/orange or tan to grey/white hue [3,4]. Upon microscopy, tumefaction frequently represents with solid, nodular or follicular configurations or an admixture of aforesaid patterns. The variable neoplastic follicles emerge as enlarged, spherical to elliptical or miniature and irregular. Follicular lumens are impregnated with basophilic or eosinophilic secretory substances which can be highlighted with mucicarmine [3,4]. Solid, nodular areas delineate sheets or irregular clusters of tumour cells. Neoplastic cells are pervaded with moderate to abundant, pale to eosinophilic cytoplasm and spherical to ovoid, hyperchromatic nuclei. Few tumour cell nuclei exhibit distinct nucleoli [3,4]. In contrast to adult granulosa cell tumour, juvenile variant commonly exhibits prominent mitotic activity. Tumefaction depicts nodular configuration with extensive hyalinization. Myxoid substance appears prominently disseminated within intervening stroma. Call-Exner bodies are infrequently encountered. Foci of apoptosis or entrapped seminiferous tubules are uncommon. Incrimination of rete testis and lymphatic or vascular invasion is exceptionally observed [3,4].

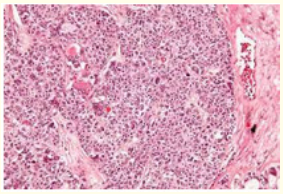

Figure 1: Juvenile granulosa cell tumour enunciating solid sheets and irregular clusters of tumour cells pervaded with moderate eosinophilic cytoplasm and regular ovoid nuclei. Tumour cell clusters are traversed by mature fibrous tissue septa [8].

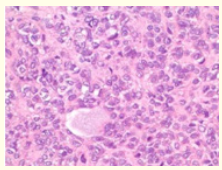

Figure 2: Juvenile granulosa cell tumour delineating follicular structures composed of neoplastic cells permeated with abundant, eosinophilic cytoplasm and uniform, ovoid nuclei. Surrounding stroma is fibrotic [9].

TNM staging of carcinoma testis [3,4]

Primary tumour

TX Primary tumour cannot be assessed •Tis Germ cell neoplasia in situ (GCNIS) •T0 No evidence of primary tumour within the testis •T1 Primary tumour confined to testis and rete testis. Vascular or lymphatic infiltration is absent. Tunica albuginea is invaded. Tumour invasion into tunica vaginalis is absent.

Pure seminoma is subdivided as ~T1a Tumour magnitude < 3 centimetres ~T1b Tumour magnitude ≥ 3 centimetres •T2 Tumour confined to testis, rete testis and extends into ≥ one components of testis as blood vessels, lymphatics, epididymis, adipose tissue confined to hilar soft tissue adjacent to epididymis or tunica vaginalis •T3 Tumour extends into spermatic cord •T4 Tumour extends into scrotum.

Regional lymph nodes

Clinical staging of regional lymph nodes is assessed with imaging techniques as computerized tomography(cN). Pathological staging of regional lymph nodes is assessed with dissection of regional, retroperitoneal, para-aortic, peri-aortic, inter-aortocaval, paracaval, pre-aortic, precaval, retro-aortic and retrocaval lymph nodes(pN).

•NX Regional lymph nodes cannot be assessed •N0 Regional lymph node metastasis absent

•N1 Regional lymph node metastasis confined to one to five retroperitoneal lymph nodes with magnitude < 2 centimetres •N2 Regional lymph node metastasis into minimally a singular enlarged lymph node or lymph node mass >2 centimetre and <5 centimetre diameter OR metastasis into >5 regional lymph nodes <5 centime-

tre diameter OR metastasis into minimally a singular lymph node between 2 centimetre and 5 centimetre diameter •N3 Regional lymph node metastasis into minimally a singular enlarged retroperitoneal lymph node or lymph node mass > 5 centimetre magnitude OR metastasis into minimally a singular enlarged lymph node or lymph node mass > 5 centimetre diameter

Distant Metastasis

•MX Distant metastasis cannot be assessed •M0 Distant metastasis into distant lymph nodes or various organs absent

•M1 Distant metastasis into ~M1a Metastasis into pulmonary parenchyma or distant lymph nodes as pelvic, thoracic, supraclavicular or visceral lymph nodes apart from retroperitoneal lymph nodes ~M1b Distant metastasis into viscera as hepatic parenchyma, skeletal system or brain. Pulmonary parenchyma may or may not be incriminated.

Serum tumour markers

•SX Serum tumour marker levels unavailable •S0 Serum tumour marker levels appear normal •S1 Minimally a singular tumour marker level exceeds normal range as ~lactic dehydrogenase (LDH) <1.5 times upper normal limit (ULN) ~βHCG < 5,000 mIu/mL ~alpha fetoprotein (AFP) <1,000 ng/mL •S2 Minimally a singular tumour marker appears substantially above normal range as ~lactic dehydrogenase (LDH) between 1.5 times to 10 times upper normal limit (ULN) ~βHCG between 5,000 to 50,000 mIu/mL ~alpha fetoprotein(AFP) between 1,000 to 10,000 ng/mL •S3 Minimally ≥ one or more tumour markers are significantly elevated ~lactic dehydrogenase (LDH) > 10 times upper normal limit(ULN) ~βHCG > 50,000 mIu/mL ~alpha fetoprotein (AFP)> 10,000 ng/mL.

Testicular juvenile granulosa cell tumour appears immune reactive to FOXL2, steroidogenic factor 1(SF1) and vimentin. Majority of neoplasms appear immune reactive to inhibin, calretinin, Wilm's tumour 1(WT1) antigen and SOX9. Neoplastic cells appear immune non reactive to glypican 3, SALL4, podoplanin (D2-40), OCT3/4 and alfa fetoprotein (AFP) [5,6]. Testicular juvenile granulosa cell tumour requires segregation from neoplasms such as yolk sac tumour, teratoma, cystic dysplasia of the testicle, Sertoli cell tumour, gonadoblastoma, unclassified sex cord stromal tumours or testicular rhabdomyosarcoma [5,6]. Upon imaging or testicular ultrasonography, a well defined, enlarged, multi-cystic or solid, intra-testicular tumefaction is observed. Ultrasonography depicts a cystic, intra-testicular or intra-abdominal neoplasm traversed by multiple fibrous tissue septa [5,6]. Biochemical assay delineates normal serum levels of alpha fetoprotein (AFP) and beta human chorionic gonadotropin (β HCG) and appear non confirmatory [6,7]. Cogent histological examination adopted subsequent to surgical manoeuvers as orchiectomy may appropriately categorize the neoplasm. Intervention techniques as testis sparing surgical manoeuvers are recommended for treating juvenile granulosa cell tumour. In addition, lesions unamenable to organ preservation may be subjected to total orchiectomy [6,7]. Testicular juvenile granulosa cell tumour is associated with superior prognostic outcomes. Disease reoccurrence or distant metastasis remains undocumented. Lymphatic and vascular invasion along with incrimination of rete testis may be expounded [6,7].

Bibliography

1. Collins K., *et al*. "Testicular Juvenile Granulosa Cell Tumors Demonstrate Recurrent Loss of Chromosome 10 and Absence of Molecular Alterations Described in Ovarian Counterparts". *Modern Pathology* 36.6 (2023): 100142.

2. Kapoor M and Leslie SW. "Sex Cord Stromal Testicular Tumor". Stat Pearls International. 2023. Treasure Island, Florida (2023).

3. Rajpert-De Meyts E., *et al*. "Testicular Cancer: Pathogenesis, Diagnosis and Management with Focus on Endocrine Aspects". In: Feingold KR, Anawalt B, Blackman MR, et al., editors. Endotext. South Dartmouth (MA): MDText.com, Inc 2000-2023 (2023).

4. Michalova K., *et al*. "Novel insights into the mixed germ cell-sex cord stromal tumor of the testis: detection of chromosomal aneuploidy and further morphological evidence supporting the neoplastic nature of the germ cell component". *Virchows Archiv* 477.5 (2020): 615-623.

5. Vatta F., *et al*. "Juvenile Granulosa Cell Tumor of the Testis: Prenatal Diagnosis and Management". *European Journal of Pediatric Surgery Reports* 7.1 (2019): e93-e95.

6. Canning DA. "Re: Juvenile Granulosa Cell Tumors of the Testis: A Clinicopathologic Study of 70 Cases with Emphasis on its Wide Morphologic Spectrum". *Journal of Urology* 196.4 (2016): 1257.

7. Kao CS., *et al*. "Juvenile granulosa cell tumors of the testis: a clinicopathologic study of 70 cases with emphasis on its wide morphologic spectrum". *The American Journal of Surgical Pathology* 39.9 (2015): 1159-1169.

8. Image 1 Courtesy: Wikimedia commons

9. Image 2 Courtesy: Science direct