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Testicular Seminoma

Pediatric germ cell tumors are rare, with 80% benign and 20% malignant. Ovarian and testicular site accounts for 40% of all cases. Testicular germ cell tumors are the most common tumors which usually occur in males between 20-40 years old. The incidence has risen markedly over the years. Testicular germ cell tumors have two main histology: seminoma and non-seminomatous. Non-seminomatous GCT includes embryonal carcinoma, choriocarcinoma, teratoma and yolk sac tumor. Teratoma, both mature and immature, are the most common histologic non-seminomatous variety. Germinomas, also term seminoma in males and dysgerminoma in females, are undifferentiated germ cell tumors typical of adolescents. Testicular germ cell tumors have two age peaks: children under three years may experience both mature teratoma and malignant yolk sac tumor, while adolescents may harbor seminomas or other mixed tumors often with delayed diagnosis and more advanced disease. The occurrence of germ cell tumors increases in children with undescended testes, and the risk is higher with Intraabdominal testes. The most common histological subtype in this situation is seminoma, which occur in adolescent and young adults. Patients with Trisomy 21 are 50 times more likely to have testicular cancer. Testicular seminoma originates in the germinal epithelium of the seminiferous tubules. The disease is thought to result from the proliferation of immature spermatogonia. There are three main pathologic categories of testicular seminoma: classical, spermatocytic and seminoma with syncytiocytotrophoblastic cells. This last type is associated with elevated serum beta-HCG levels. A seminoma with a high mitotic index (>3 mitotic figures/HPF) is designated an anaplastic seminoma, a more aggressive tumor. Main clinical findings with testicular seminoma are a painless scrotal mass which may be associated with infertility, though the tumor may appear as an emergent situation with pain and acute inflammatory characteristics and hydrocele. On physical exam there is a unilateral, firm to hard palpable mass in the scrotum localized to the testis. In a patient with a testicular mass, serum markers measurements represent the first diagnostic step to verify a possible malignant germ cell tumor. These include AFP, beta-HCG and LDH. AFP elevation indicates non-seminomatous disease, LDH is used to follow the overall seminomatous tumor burden, and beta-HCG is present in 5-10% of seminoma patents usually associated with metastatic disease. In addition, Placental alkaline phosphatase (PALP) produced by the placenta, is also produced by cancer cells. PALP is not specific for testicular tumors, it can also be found in pulmonary, digestive system, breast, and female reproductive organ cancer. PALP is commonly employed as a routine diagnostic marker for seminoma/germinoma. PALP can be detected in 98% of seminomas, 85% yolk sac tumor and 97% embryonal carcinomas, but not in teratomas. OCT4 is an ectomere binding

transcription factor detected in tumor germ cells which has pluripotent potential. It is mostly detected in seminomas, embryonal carcinomas, dysgerminomas, and germ cell component of gonadoblastoma. OCT4 is positive in 100% seminomas and negative in normal testicular tissue. OCT4 is more specific and sensitive that PALP. Ultrasound of the scrotum is the preferred initial imaging investigation to evaluate any suspected testicular mass growth. Diagnostic work-up includes a thoraco-abdominal CT-scan to evaluate possible metastatic spread, especially on lungs and on the retroperitoneal lymph nodes. Should the suspected lesion suggest a neoplasm, a surgical approach on the tumor is recommended as soon as possible. Surgery is the main therapy for testicular tumors. This includes an inguinal approach with vascular control before mobilization of the testis. If malignancy is proven by frozen section examination of a biopsy of the mass, en-bloc resection of testis and spermatic structures with high ligation of the cord at the internal inguinal ring is needed (radical inguinal orchiectomy). Patients with scrotal skin involvement by the tumor and those operated or biopsied through a scrotal approach should undergo hemiscrotectomy to ensure local disease control. Retroperitoneal lymph node dissection is required when enlarged nodes remain after chemotherapy. Inguinal nodes exploration is indicated only in patients with scrotal involvement. Seminomatous and non-seminomatous tumors are notable for their responsiveness to chemotherapy. Seminoma is one of the most treatable cancer with a survival rate of 98% in early-stage disease. Testicular seminoma is also sensitive to radiation therapy. Radiation therapy planning is based on the results of a contrast-enhanced CT of the chest, abdomen, and pelvis.

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Choriocarcinoma

Pediatric germ cell tumors most commonly develop within the gonad, though extragonadal primary tumors can involve the anterior mediastinum, retroperitoneum, or the central nervous system. Choriocarcinoma is a very rare and aggressive germ cell neoplasm of trophoblastic origin. Choriocarcinoma is a disease seen predominantly in women, but men can also be affected as part of a mixed germ cell tumor. Two types of choriocarcinoma have been described: gestational and non-gestational. Gestational choriocarcinoma is the most common form, affect only females and arises following a hydatidiform mole, normal pregnancy or most commonly, spontaneous abortion. Non-gestational choriocarcinoma is rare, arises from pluripotent germ cell, can affect young males or females, in the gonads, or

midline structures with pluripotent germ cells. The pathogenesis of choriocarcinoma start with cytotrophoblastic cells functioning as stem cells and undergoing malignant transformation. Choriocarcinoma Histologic demonstrate syncytiotrophoblasts, these are large eosinophilic multinucleated cells with known large hyperchromatic nuclei, intermixed with cytotrophoblasts, polygonal cells with distinct borders and single irregular nuclei. Choriocarcinoma show absence of chorionic villi and presence of abnormal intermediate trophoblast and cytotrophoblast, rimmed with syncytiotrophoblasts with areas of necrosis and hemorrhage. Choriocarcinoma is a extremely vascular neoplasm characterized by necrosis and absence of chorionic villi. In mixed germ cell tumors, choriocarcinoma will show mixtures of syncytiotrophoblasts and cytotrophoblasts with varying component of other germ cell tumors. Apart from the uterus, it can be found in tubes, ovaries, lung, liver, spleen, kidneys, bowel, and brain. Spontaneous abortions and molar pregnancy increase the risk of developing choriocarcinoma. Due to elevation of HCG, patients can present with abnormal uterine bleeding, gynecomastia in men and hyperthyroidism. Males can show symptoms of metastatic disease with hemoptysis, involved liver, gastrointestinal tract, and brain. Choriocarcinoma secrete human chorionic gonadotropin (HCG). HCG is an excellent biomarker of disease progression, response, and subsequent post-treatment surveillance. After diagnosis of choriocarcinoma evaluation for malignancy should be undertaken. The lung is the most common site of metastatic disease. Brain, chest, abdomen, and pelvis should be evaluated by CT or MRI imaging. Management of choriocarcinoma entails multimodal therapy with drugs, radiation, and surgery. Low risk choriocarcinoma can be managed with single agent chemotherapy. High-risk disease is managed with multi-agent chemotherapy, adjuvant radiation and surgery. Removal of the uterus or metastatic foci is performed in conjunction with chemotherapy. The prognosis of non-gestational choriocarcinoma is worse than his gestational counterpart due to low sensitivity to chemotherapy. Low risk choriocarcinoma has a 100% survival in women managed with chemotherapy, while high-risk tumors have a 90% survival with multiagent therapy with or without radiation and surgery. Primary infantile or neonatal choriocarcinoma is extremely rare with most cases involving metastatic disease to the fetus from an intraplacental choriocarcinoma. Is associated with a poor prognosis and high mortality for the baby. Most of these mother with choriocarcinoma were asymptomatic during pregnancy. Most babies show anemia, developmental delay, hepatomegaly, hemoptysis, or respiratory failure. Ultrasound shows a tumor with rich vascularization. Beta-HCG is extremely high. Management is multiagent chemotherapy. Infantile choriocarcinoma represent a metastatic focus from primary maternal or placental gestational trophoblastic tumor.

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Microaggression in Surgery

Originally described by Chester Pierce in 1970, microaggression referred to a minor damaging humiliation and indignity toward African-Americans. Subtle comments, slights and insults directed toward minorities, as well as to women and other stigmatized groups that engender hostility. Microaggresion is a brief and commonplace verbal, behavioral or unintentional environmental discrimination against a personal characteristic such as gender, sexual orientation, race, or ethnicity. Microaggressions are associated with a negative emotional response which may be associated with worsening mental health. They have a negative effect and unpleasant psychological impact on recipients. The term microaggression expanded in 2007 to include all minorities groups as well as marginated communities. Microaggressions can be a conscious or unconscious microprejudice. Four subtypes of microaggression have been described: microassault, microinsult, microinvalidations, and environmental microaggressions. Microassault are "old fashioned" discriminatory statements, often intentional, characterized by verbal or nonverbal attacks clearly intended to offend the recipient. Microassaults are toward individuals rather than a group with racism motivation. Microinsults are subtle snubs or humiliations that convey a demeaning message to the recipient in a way that may be unintentional to the perpetrator. It happens when women or minority members of society are confused for a nurse, janitor, or interpreter, because they are not seen as a traditional physician. Ignoring medical students in the operating room or doing rounds, making comments that suggest people obtained their current position because of affirmative action rather than knowledge, skills, or abilities. Microinvalidations are performed to exclude, negate, dismiss the personal thoughts, feelings, or experiment reality of a person. They deny concern about fairness by insisting that the workplace in a meritocracy or invalidating a woman or minority student experience of inequality by calling them oversensitive. Environmental microaggressions occur when microassault, microinsult and microinvalidation are reflected in the cultural processes and climate of the workplace. An example is a hallway decorated with pictures of white male surgeons, when medical schools and departments of surgery unintentionally exclude and minimize the identity of minorities and women by excluding accomplishments and portrait of members of some racial, ethnic, and cultural background. Microaggressions adversely affect the psychological and physical health of the recipient. Microaggressions produce depression, anxiety, traumatic response, increase use of alcohol and hypertension in the recipient. Racism and sexism that manifest as microaggressions in the workplace present dilemmas for individuals from minorities groups. Microaggressions can be responded by raising a voice of concern and resistance, relying on social networks for support, or developing self-protective mechanisms such as desensitization. A structured response from the recipient can start with a conversation with the perpetrator to observe, think, feel and desire how the comment was interpreted. Next the victim can use action by asking clarifying questions, tell what you observed, discuss the impact of the comment, and express your own thought and feeling about the situation. A third strategy of response is to focus on what was observed and the recipients' resulting thoughts or feelings to decrease

the potential for defensiveness and encourage dialogue. Subtle racial comments, actions, and assumptions are witnesses, are experiences by minority medical students contributing significantly to feelings of burnout, invalidation, and insecurity in them. Bias is the prejudice in favor of or against one thing, person, or group. When bias is unconscious, uncontrollable, or as result of an irrational process, the bias is implicit. Implicit bias in medical education can result in inaccurate evaluations that affect promotion and disproportionate hiring and representation. Microaggression and implicit bias can extend bidirectionally from patient to physician as well as from physician to patient. Environmental invalidations are the most common microaggression reported, suggesting women in surgery face ongoing microaggressions at the systemic level creating many barriers to advancement. Implicit bias can manifest in microaggressive actions such as overlooking women for positions of power or offering challenging cases to male colleagues who are believed to be more capable than their female counterpart. Women experience more microaggressions than men during virtual residency interviews, with the most commonly experienced microaggression type being environmental. As response, women lower the ranking and stand out negatively toward those programs committing microaggressions.

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