

Cancer Association of South Africa (CANSA)



Fact Sheet on Endodermal Sinus Tumour of the Testicles

Introduction

Swollen and/or tender testicles in infants could be the result of a variety of conditions. If this is the case just after birth, it is most likely because of the extra fluid newborn babies carry or the extra dose of hormones he may have received from his mother just before birth. This swelling is harmless, and the fluid will flush out in his urine after a few days. If the swelling continues, particularly if he has only one swollen testicle, the baby may have developed a hydrocele, in which fluid from the abdomen accumulates in a testicle, or possibly an inguinal hernia, in which a loop of the intestine pokes down into the testicle.



[Picture Credit: Infant Boy]

Whatever the reason, professional medical advice should be sought in all cases.

Ulbright, T.M. 2018.

“Accurate diagnosis of primary and metastatic tumours is essential in testicular cancer. While many cases are straightforward, some pose difficulties, especially when variant morphologies occur. Seminoma with 'atypical' features, including increased nuclear pleomorphism and crowding and greater cytoplasmic density with loss of membrane definition, mimics embryonal carcinoma, although ancillary features (fibrous septa, lymphocytes) and immunohistochemistry are of great help. Other deceptive seminoma features include prominent to exclusive intertubular growth, microcystic/tubular patterns, and signet-ring tumour cells. Conversely, embryonal carcinomas may have 'seminoma-like' foci, as may Sertoli cell tumours with diffuse growth and pale cytoplasm. Solid pattern yolk sac tumour mimics seminoma and, conversely, microcytic seminoma resembles yolk sac tumour. Other architectural patterns, ancillary yolk sac tumour features (intercellular basement membrane deposits, hyaline cytoplasmic globules) and immunohistochemistry aid in distinction from seminoma. Embryonal carcinomas may show, in addition to 'seminoma-like' foci, pseudoendodermal sinus-like structures, sieve-like patterns, endometrioid-like morphology and prominent zones of stratified columnar tumour cells. These may cause confusion with yolk sac tumour and teratoma, although

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careful attention to cytological features usually suffices for accurate diagnosis. Recent work has defined 'new' primary trophoblastic tumours, i.e., cystic trophoblastic tumour and epithelioid trophoblastic tumour. The newly termed 'spermatocytic tumour' occasionally consists mostly of a monotonous proliferation of intermediate-sized tumour cells with prominent nucleoli, thereby simulating either seminoma or embryonal carcinoma. Prostatic adenocarcinoma remains the most common tumour to metastasise to the testis and can cause confusion with rete carcinomas and primary germ cell tumours. Post-chemotherapy resections pose their own challenges. Effete tumour cells in areas of necrosis and prominent fibroxanthomatous reactions should not be interpreted as persistent, viable germ cell tumour. 'Fibrosis' often has atypical widely scattered spindle tumour cells in a densely collagenous background but does not merit additional treatment apart from excision. The marked cytological atypia that may occur in metastatic teratoma may be disconcerting but, again, the proper treatment is complete surgical excision rather than more chemotherapy. Glandular and sarcomatoid yolk sac tumours, which are almost exclusively seen after chemotherapy, resemble adenocarcinomas and sarcomas, respectively. Unlike de novo malignancies, they are mostly seen in sites expected for metastases."

Endodermal Sinus Tumour of the Testicle

Endodermal sinus tumour of the testicles is also known as Yolk sac tumour.

Signs and Symptoms of Endodermal Sinus Tumour

The early stages of endodermal sinus tumour often cause no symptoms. When symptoms do occur, they may include the following:

- Raised alpha-fetoprotein (AFP) serum levels
- Nausea
- Vomiting
- Headache
- Cough
- Fever
- Changes in bowel function or habits
- Fatigue
- Problems with breathing
- Weight loss
- Night sweats

Symptoms for location-specific endodermal sinus tumour may include:

- Swelling of the buttocks
- Swelling of the brain (hydrocephalus)
- Swelling of the testicles
- Chest pain
- Vision problems
- Shoulder or arm pain

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- Mass or swelling in the abdomen
 - Testicular mass
- (Davidoff, *et al.*, 1996).

Essential Features of Endodermal Sinus Tumour of the Testicles

- 2 biologically distinct entities:
 - Postpubertal type (germ cell neoplasia in situ [GCNIS] - related and usually as part of mixed tumor)
 - Prepubertal type (unrelated to germ cell neoplasia in situ and usually pure)
- Multiplicity of histological features with various mimickers
- Most overlooked germ cell tumor subtype
- Elevated serum alpha fetoprotein (AFP) should raise the suspicion for a yolk sac component

Endodermal Sinus Tumour (EST) of the Testicles

Endodermal sinus tumour (EST), also known as yolk sac tumour (YST), is a member of the germ cell tumour group of cancers. It is the most common testicular tumour in children under 3, and is also known as infantile embryonal carcinoma. This age group has a very good prognosis.

Endodermal Sinus Tumour (EST) is observed in two forms or age groups: pure EST in young children and mixed type in adults. EST is the most common testicular neoplasm in prepubertal children, accounting for 80% of testicular germ cell tumours in this age group, with a median age of 1.5 years.

In adults, EST presents as a component of mixed non-seminomatous germ cell tumour, with an age averaging 25-30 years. EST components are present in 40-50% of non-seminomatous germ cell tumours in the adult testis. In children, ESTs are more common in Asians than in white or black persons. In adults, these tumours are more common in white individuals than in other races.

In contrast to the pure form typical of infants, adult endodermal sinus tumours are often found in combination with other kinds of germ cell tumour, particularly teratoma and embryonal carcinoma. While pure teratoma is usually benign, endodermal sinus tumour is malignant.

Incidence of Endodermal Sinus Tumour of the Testicles in South Africa

The National Cancer Registry (2016) does not provide any information on Endodermal Sinus Tumour of the Testicles.

Diagnosis and Treatment of Endodermal Sinus Tumour (EST) of the Testicles

The first-line treatment for endodermal sinus tumour is surgery to remove the tumour. This is followed by chemotherapy.

EST, in all locations, are highly malignant and metastasise to lymph nodes, lung, liver and bone. There is no satisfactory therapy for the endodermal sinus tumour, regardless of location, when there are distant metastases at the time of diagnosis.

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(Olsen, *et al.*, 1982;

Testicular tumours in children are uncommon, comprising about 1% of paediatric malignancies. EST is the most common malignant testicular tumour in children. Because EST in children is rarely seen, its treatment has been controversial.

Results suggest that EST of the testicles in children is a tumour with a favourable prognosis. Serum AFP concentration is extremely useful in diagnosis and monitoring of treatment response. Radical inguinal orchiectomy alone seems adequate for patients with stage I disease if serum AFP concentrations return to normal postoperatively. Blood marker AFP (alpha fetoprotein) is elevated in >90% cases of yolk sac tumour. Macroscopically, the testis is replaced by a gelatinous mass. Microscopically, a positive reaction for AFP is seen in tumour cells.

Cisplatin-based combination chemotherapy should be administered in patients with tumour recurrence or metastasis.

(Kuo, *et al*).

Song, Q.D. 2018.

“Testicular yolk sac tumors are rare, and analyses of relevant ultrasound (US) findings are limited. We retrospectively reviewed the US features of 21 pathologically verified cases (patients aged 10-64 months). Neoplasms were unilateral and solitary, occupying part (focal) or all (diffuse) of the testis. Focal lesions (14 cases) were usually solid and ovoid, with a homogeneous echo texture or multiple random anechoic spaces, and hypervascular. Diffuse neoplasms had heterogeneous echo textures; most were hypervascular. On spectral Doppler US imaging, 11 cases had a mean peak systolic velocity of 12.9 cm/s and a mean resistive index of 0.54. Ultrasound is a useful tool for imaging pediatric testes when a yolk sac tumor is suspected.”

Cornejo, K.M., Frazier, L., Lee, R.S., Kozakewich, H.P. & Young, R.H. 2015.

“We report 33 pure yolk sac tumors of the testis from boys 5 to 71 months of age (mean 20.7 mo) diagnosed from 1918 to 2014. All except 1 underwent orchiectomy, with lymph node dissections (all negative) performed in 18; 21 also received chemotherapy and 12 radiotherapy. The tumors were 1.6 to 7.0 cm (mean 3.7 cm) and were nonencapsulated, with a gray to yellow, often mucoid, cut surface. The commonest pattern was reticular-microcystic, but macrocystic, papillary, endodermal sinus (Schiller-Duval bodies), labyrinthine, myxomatous, glandular, and solid patterns were also observed. Follow-up was available for 32 patients (mean 100.5 mo; range, 3 to 456 mo). Twenty-four patients (including 4 who did not receive adjuvant therapy) were without evidence of disease, 8 had metastatic disease; 5 of the latter died of tumor and 1 of treatment complications. Two patients with metastasis were cured with radiation with or without chemotherapy. Two or more of the following were associated with a poor outcome in patients presenting with stage I cases: tumor size >4.5 cm (4/6 tumors [67%]), invasion of rete testis and/or epididymis (3/7 tumors [43%]), and necrosis (6/17 tumors [35%]). In the nonmetastasizing group, 2 or more unfavorable features occurred in only 3/24 tumors (13%) (P=0.0001). It is crucial that this tumor be distinguished from the juvenile granulosa cell tumor, which occurs at a slightly younger age and has distinctive features, although there may be some morphologic overlap. The survival of young boys with testicular yolk sac tumor is very good because of both effective chemotherapy and likely, the inherent characteristics of the tumor in this age group.”

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About Clinical Trials

Clinical trials are research studies that involve people. They are conducted under controlled conditions. Only about 10% of all drugs started in human clinical trials become an approved drug.

Clinical trials include:

- Trials to test effectiveness of new treatments
- Trials to test new ways of using current treatments
- Tests new interventions that may lower the risk of developing certain types of cancers
- Tests to find new ways of screening for cancer

The South African National Clinical Trials Register provides the public with updated information on clinical trials on human participants being conducted in South Africa. The Register provides information on the purpose of the clinical trial; who can participate, where the trial is located, and contact details.

For additional information, please visit: www.sanctr.gov.za/

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