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Commentary

Impact of Surgical Anatomy of Pediatric Solid Tumors on Embryology

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DESCRIPTION

The Pediatric solid tumours are a type of nonhematologic extracranial cancer that develops during childhood. This diverse group of tumours accounts for approximately 40% of all pediatric cancers. Many pediatric solid tumours are referred to as embryonal or developmental cancers because they develop in young children or adolescents as a result of changes in the organogenesis or normal growth processes. To understand the pathogenesis of these conditions, it is critical to be familiar with the underlying embryology that contributes to tumorigenesis, as these tumours develop as a result of a failure of proper differentiation of the organ from which they arise. Furthermore, because surgical resection is the mainstay of therapy for many pediatric solid tumours, understanding key aspects of surgical anatomy is critical for successful outcomes.

Neuroblastoma is a cancer that develops from immature nerve cells found throughout the body. Neuroblastoma most commonly develops in and around the adrenal glands, which have similar origins to nerve cells and sit atop the kidneys. Neuroblastoma most commonly affects children aged 5 and under, though it can occur in older children as well. Some types of neuroblastoma resolve on their own, while others may necessitate multiple treatments. Your child's neuroblastoma treatment options will be determined by a number of factors.

Germ cell tumours are abnormal cell growths that develop from reproductive cells. Tumors may or may not be cancerous. Germ cell tumours most commonly occur in the testicles, but they can also occur in the chest, tailbone, and brain. or perhaps the ovaries. It is unknown why some germ cell tumours occur in other parts of the body, such as the abdomen, brain, and chest. Germ cell tumours can occur at any age, but they are most common in children, teenagers, and young adults.

Wilms' tumour is a rare type of pediatric kidney cancer. It is the most common type of kidney cancer in children and is also known as nephroblastoma. Wilms' tumour most commonly affects children aged 3 to 4 and becomes much less common after age 5. Wilms' tumour is most commonly found in one kidney, though it can occasionally be found in both kidneys at the same time.

Hepatoblastoma is a disease in which malignant cancer cells (metastasis) form in the tissues of the liver. It is the most common type of childhood liver cancer and usually affects children under the age of three. Hepatoblastoma cancer cells can also spread to other parts of the body. Hepatoblastoma primarily affects children between the ages of infancy and five years. The majority of cases appear during the first 18 months of life. Hepatoblastoma affects white children more frequently than black children, and it is more common in boys than girls until about the age of 5, when the gender difference disappears. It is more common in children who were born very prematurely and with very low birth weights.

Rhabdomyosarcoma (RMS) is a rare type of cancer that develops in soft tissue, specifically skeletal muscle tissue or, in rare cases, hollow organs such as the bladder or uterus. We may think of our skeletal muscles as being primarily in our arms and legs, but RMS can begin almost anywhere in the body, including parts of the body that do not normally have skeletal muscle. RMS can occur at any age, but it most commonly affects children.

Retinoblastoma is an eye cancer that starts in the retina, the sensitive lining inside your eye. Retinoblastoma is most common in children, but it can occur in adults on rare occasions. Retinoblastoma can affect either or both eyes. The most common initial retinoblastoma symptom is a visible whiteness in the pupil known as "cat's eye reflex" or leukocoria. This unusual whiteness is most noticeable in low-light situations or when photographs are taken with a flash.

The organogenesis and subsequent tumorigenesis of the most common extracranial pediatric malignancies, including hepatoblastoma, neuroblastoma, sacrococcygeal teratoma, and Wilms tumour, have been described. These malignancies develop as a result of abnormalities in several complex pathways, making them difficult to treat with current medical therapeutics.

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