Children's Orthopaedics of Atlanta
at Children's Healthcare of Atlanta

PEDIATRIC NEWS STEPPING FORWARD WINTER 2010

Tumors: *primary malignant bone and soft tissue*

Primary malignant bone and soft tissue tumors are a rare condition in children. They account for less than 3000 new cases annually in the US. They account for approximately 11% of all tumors. Despite this, malignant tumors of bone account for more than 50% of amputations performed in children. It is also one of the most common causes of death among adolescents. Currently 80 to 85% of the patients with primary bone tumors can be managed safely with wide resection and limb preservation without affecting their long term outcome.

Advances in imaging and chemotherapeutic agents have dramatically increased the long term survival of sarcoma patients. MRI has improved our ability to visualize the tumor and evaluate its response to chemotherapy. Chemotherapy and radiotherapy have resulted in an increased survival rate. With preoperative chemotherapy along with surgery the five year survival rate for osteosarcoma and Ewing's sarcoma approaches 70-80%. The prognostic implications and treatment significance of genetic advancements are still evolving, but will most likely play a major role in the near future.

EVALUATING A CHILD WITH A SUSPECTED TUMOR MUSCULOSKELETAL TUMOR REQUIRES A CAREFUL HISTORY AND PHYSICAL EXAMINATION.

Radiographic evaluation should include plain radiographs and MRI of the entire extremity including the joint above and below the tumor. CT scan of the chest is used detect metastatic lesions, while a bone scan is used to identify skip lesions or other bony metastases. Bone marrow aspirates are performed for soft tissue and Ewing's sarcoma ideally at the time of biopsy.

Figure 1. X-ray of lesion in proximal tibia.

There are as many types of reconstruction options as there are levels of amputations. Careful preoperative planning and counseling will aid in the proper decision making and improve patient satisfaction as well as outcomes. It is of utmost importance to be able to compare clinical and functional outcome based on the location, type, and surgical option chosen. Treating such conditions involves a team of specialists familiar with sarcomas in children. These include radiologists, pediatric pathologists, oncologists, prosthetists, physical therapists, social workers and surgeons.

Even though an amputation may still be required, your child may be a candidate for limb sparing, sometimes called limb salvage (preservation) surgery. Strides in surgical and chemotherapeutic regimens have made this a possibility. Twenty years ago 80% of the patients underwent amputations. Today around 80% of the patients are candidates for limb sparing surgery.

What options does my child have?

Your child will have several options, when it comes to tumor resection. This will depend on the tumor type, location, spread to other regions (metastasis), and response to chemotherapy. There are three main options; limb sparing, amputation or rotationplasty.

An amputation is a surgical procedure performed to eliminate a diseased portion of the extremity. This used to be the only surgical option in the past. Even with advances in medicine your child may still require such a procedure.

Figure 2. Metal prosthesis replacing femur.

What is limb sparing surgery?

Limb sparing surgery allows your child an opportunity to keep his extremity. During the procedure only the malignant tumor tissue is removed. The resected portion of tissue and bone is replaced by metallic (prosthesis) or bone transplants (allograft). If your child is under the age of 10, he may be a candidate for a growing prosthesis.

Is my child a candidate for limb sparing?

The first step to identify if your child is a candidate for limb sparing surgery is a biopsy, removing a piece of tissue to diagnose his condition. Then staging, (identify extent and/or spreading of tumor) is performed using sophisticated radiographic technology available at Children's Healthcare of Atlanta. Your surgeon will then decide if the tumor can safely be removed in its entirety without compromising the overall integrity of the limb. Tumors that are too close to a major nerve or artery may not be candidates. If not, an amputation or rotationplasty may be recommended.

What advantages are for a rotationplasty?

A rotationplasty is an effective and reliable reconstruction method that removes a portion or segment of the limb. The lower portion of the leg is then rotated 180° and reattached - the ankle acts like a

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knee joint, providing extra function, more mobility and better control with a prosthesis. Thus, making what would have been an above the knee amputation into a below the knee amputation.

Who will take care of my child?

The oncologic rehabilitation program and Children's Orthopaedics of Atlanta provides care that is specific to the pediatric patient. A team of specialists will help to ensure the best possible outcome for your child. This multidisciplinary approach provides one of the most extensive programs in the nation. This will ensure that regardless of what surgical procedure your child has, he or she will be given the best opportunity for success. This includes a team of rehabilitation specialists, orthotists and prosthetists, and surgeons working as one to achieve a common goal. Your child will be introduced to patients and families who have undergone a similar procedure, to aid in your decision making.

If you need clarification about any of this material or would like to speak to one of our surgeons for a more in depth discussion about surgical treatments, please do not hesitate to contact us.

Figure 3. MRI of lesion in proximal tibia.

Professionals On Staff

Pediatric Orthopaedic Surgeons

Michael Busch, MD
Dennis Devito, MD
Michael Schmitz, MD
Tim Schrader, MD
Jorge Fabregas, MD
Jed Axelrod, MD

Pediatric Sports Medicine

Michael Busch, MD
David Marshall, MD
William Primos, MD
David Kloehs, MEd, ATC

Orthopaedic Physician Assistants

Ed Wilson, PhD, RT, PA
Lynda Palmer, PA
Brian Kelly, PA
Ashley Mezzanotte, PA
Rebecca Lunsford, PA
Nancy Kralovich, PA
Derek Zefo, PA

Your patients deserve the best care.

Children's Orthopaedics of Atlanta provides referrals that are worthy of your reputation.

AND, HERE'S WHY: We have six board eligible/certified pediatric fellowship trained orthopaedic surgeons, two sports medicine trained pediatricians and seven orthopaedic physician assistants, and one athletic trainer. These providers comprise the majority of orthopaedic providers at Children's Healthcare of Atlanta at Scottish Rite. The Orthopaedic Program at Children's was ranked fifth in the country by Newsweek Magazine in 2009.

Children's Orthopaedics of Atlanta, PC has four bilingual scheduling operators and one pediatric orthopaedic surgeon fluent in spanish. The availability of a Spanish speaking surgeon and support staff will be very valuable to your Spanish speaking parents and patients.

THE TESTIMONIALS FROM REFERRING PRACTICES CONFIRM THE FACT THAT OUR PATIENTS AND FAMILIES ARE TREMENDOUSLY SATISFIED WITH OUR PHYSICIANS AS WELL AS OUR SUPPORT AND OFFICE STAFF.

We have six convenient locations throughout greater Atlanta for initial evaluation and follow-up. These locations throughout the area make it easier to refer your patients to one of our offices near your patient's home or parent's workplace.

Our surgeons provide twenty four hour a day seven days a week emergency room coverage at Children's Healthcare of Atlanta at Scottish Rite Hospital - the only hospital in Georgia to have its emergency room continually covered by a fellowship trained pediatric orthopaedic surgeon.