

Lumps and Bumps In Children

The Common and The Uncommon



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Disclosures

- None

Objectives

- As a result of attending this session, participants will be able to:
 - Diagnose a number of soft tissue lesions commonly seen in children
 - Determine the indications for imaging of soft tissue lesions
 - Suspect atypical or malignant lesions

Spectrum of Pediatric Surgery

- Congenital Anomaly Surgery
- Oncologic Surgery
- Head and Neck Surgery
- Thoracic Surgery
- Abdominal Surgery
- Gynecologic Surgery
- Acute Care Surgery
- Trauma
- Extracorporeal Membrane Oxygenation

Audience Polling

- The most common location of a dermoid cyst in children is
 - A the nasal bridge
 - B the angle of the eyebrow
 - C the midline of the neck
 - D the midline of the forehead
 - E the scalp

Case Presentation



- 4 year old Black boy
- No PMH
- 6 months history of a slowly increasing midline neck mass.
- Asymptomatic
- Next?

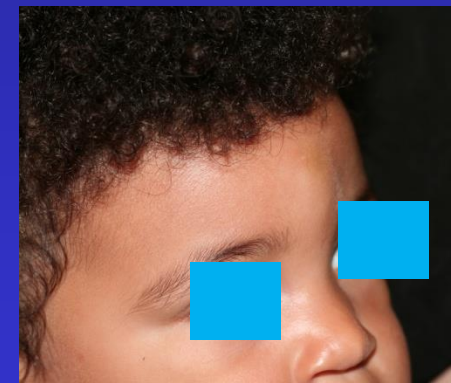
Differential Diagnoses



- Dermoid Cyst
- Thyroglossal Duct Cyst
- Lymph Node
- Thyroid Mass

Dermoid Cysts

- Congenital cysts that result from sequestration of skin along lines of embryonic closure.
- Lined by epithelium and contain epithelial appendages.
- If no appendages, lesion labeled *epidermoid* cyst.

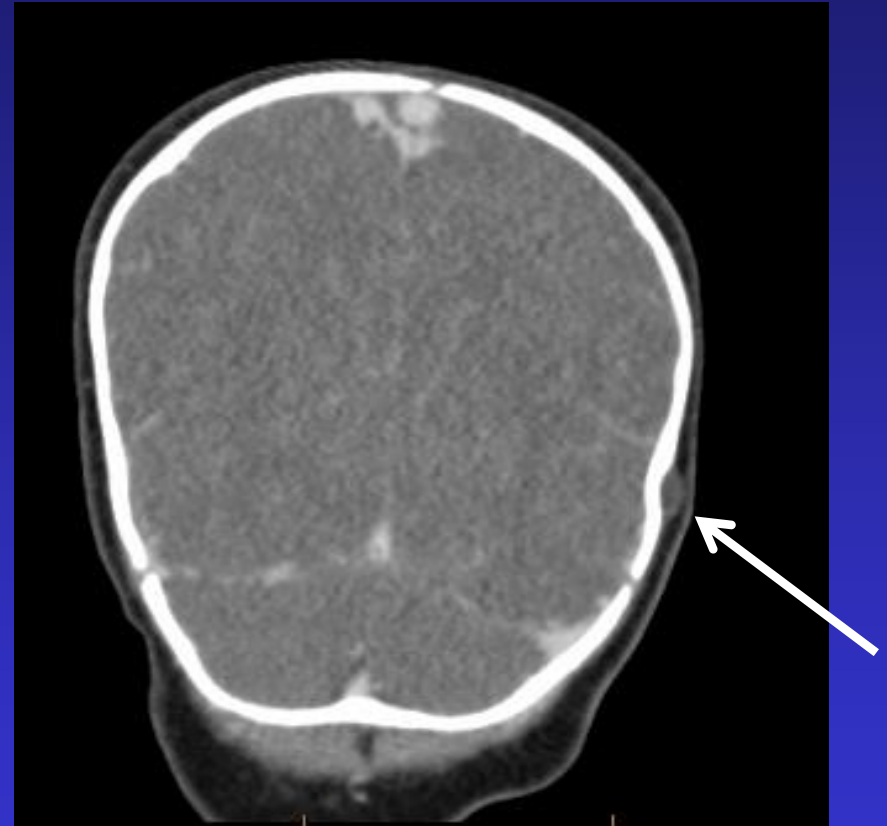


Dermoid Cysts

- Diagnosis by clinical exam.
- Imaging (CT/MRI) only if suspicion of intracranial component.
 - Fixed
 - Glabellar
 - Scalp
- Excised due to risk of growth and rupture.

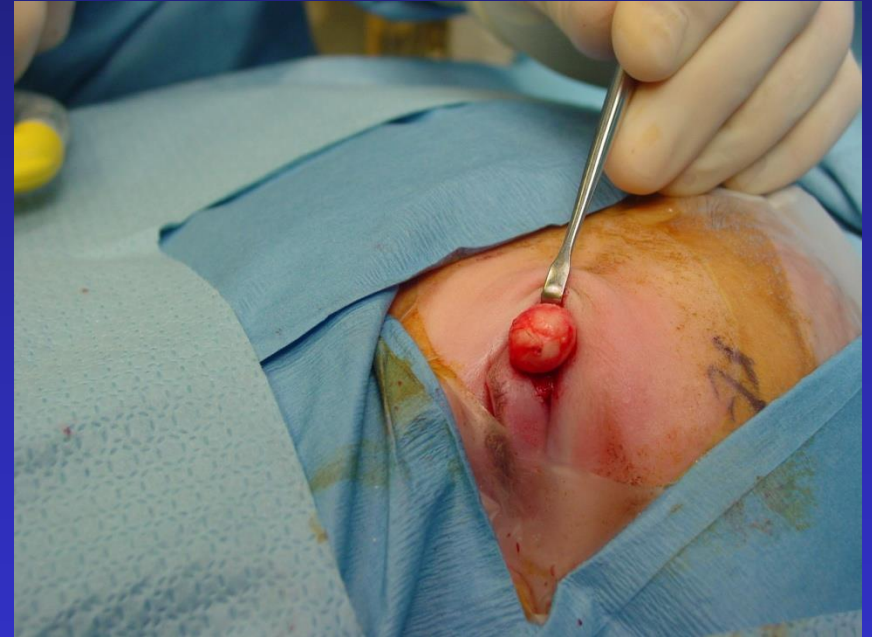
Dermoid Cyst

CT Scan



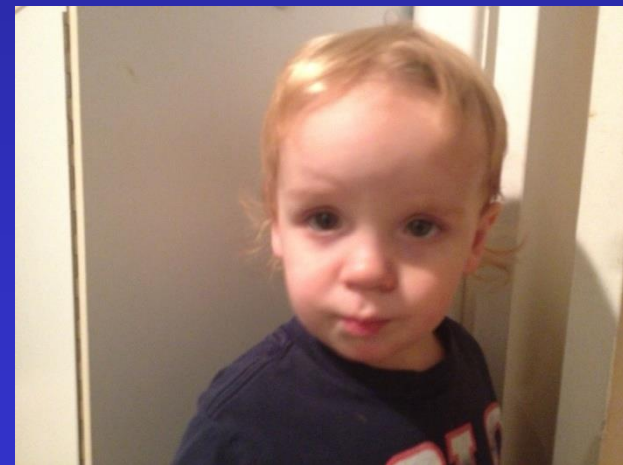
Angular Dermoid

Eyelid Crease Incision



Angular Dermoid

Eyelid Crease Incision



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Diagnosis: Dermoid Cyst



- Confirmed at operation.
- Simple Excision.

Epidermoid Cysts



Thyroglossal Duct

Thyroid Embryology

- Arises as midline diverticulum from the floor of the pharynx at the foramen cecum.
- Descends into neck as hollow cylinder and consolidates into a bilobed solid gland.
- Hyoid bone forms during this descent in close proximity to the tract.
- After descent, thyroglossal duct normally ruptures and resolves.

Audience Polling

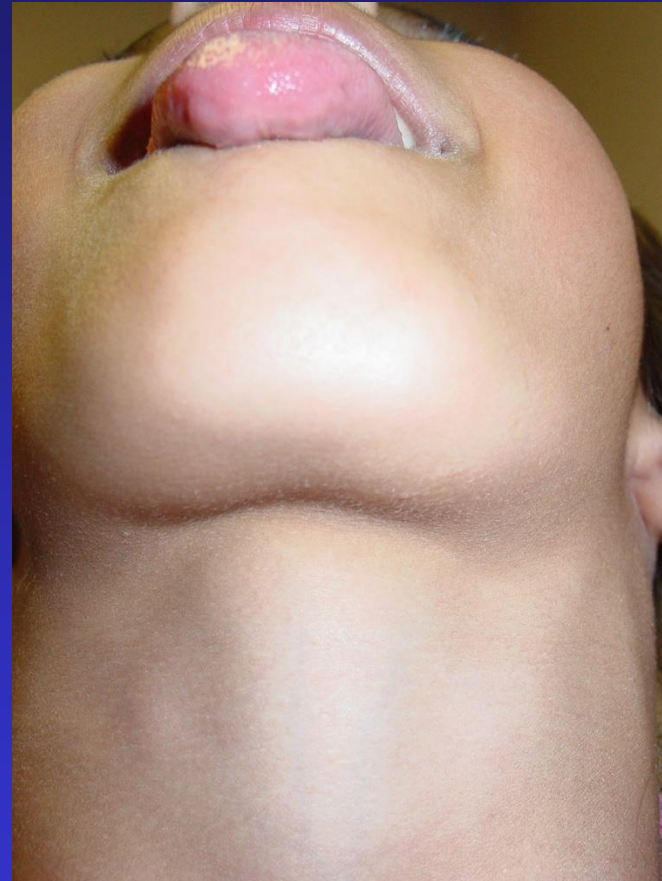
- Thyroglossal duct cysts most commonly occur at
 - A the hyoid bone
 - B the cricoid cartilage
 - C the thyroid cartilage
 - D the upper tracheal rings
 - E the level of the thyroid isthmus.

Thyroglossal Duct Cyst

- Persistent tract between thyroid and foramen cecum.
- Can occur anywhere between base of the tongue and suprasternal notch.
- 75 % occur just inferior to the hyoid bone.
- Most present in childhood.
- Can present as mass or abscess.

Thyroglossal Duct Cyst

Diagnosis



Thyroglossal Duct Cyst

Differential Diagnoses

- Submental lymph node.
- Midline dermoid cyst.



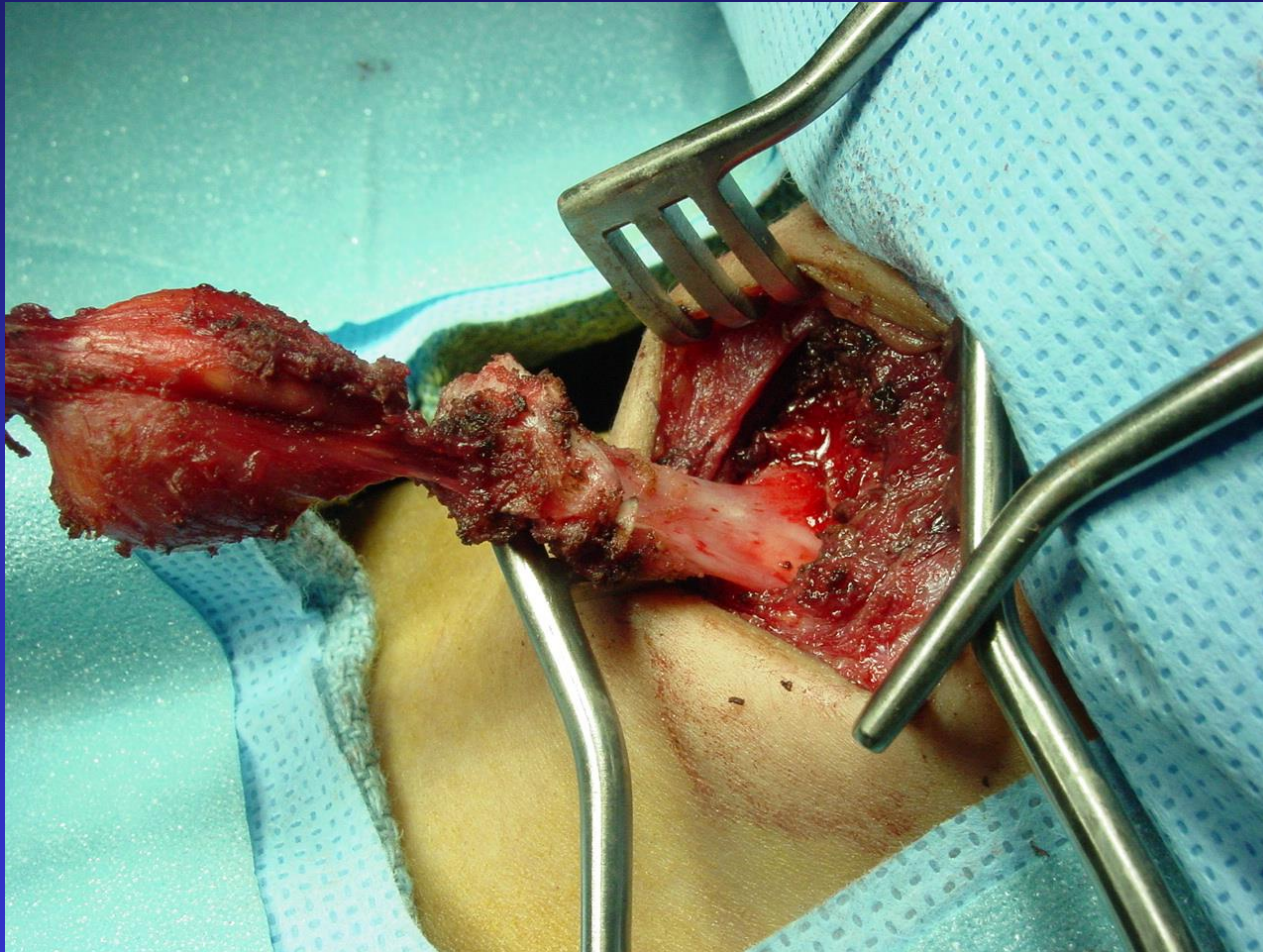
Thyroglossal Duct Cyst

Imaging

- Routine imaging with US and Thyroid scan has been suggested to screen for dermoid cyst and ectopic thyroid.
- In the majority of cases, this is not required.
- Patients with ectopic thyroid will typically present early with hypothyroidism and can be selected for imaging.

Thyroglossal Duct Cyst

Rx: Sistrunk Procedure



Thyroglossal Duct Cyst

Failure to Excise Hyoid



Audience Polling

- The most appropriate management of a large asymptomatic infantile hemangioma on the torso is
 - A Observation
 - B Laser treatment
 - C Propranolol
 - D Vincristine
 - E Embolization

Vascular Lesions

- Vascular Tumors
 - Undergo an active growth phase of endothelial proliferation and hypercellularity followed by a gradual involutional phase over several years.
- Vascular Malformations
 - Congenital malformations that exhibit normal levels of endothelial turnover and grow proportionately with the child.

Case Presentation

- 6 month old boy
- Two growing lesions on the right shoulder and left chest wall
- Asymptomatic
- Next?



Case Presentation

Infantile Hemangioma

Age 2.5 years

- Complete physical examination.
- Ultrasound of the abdomen.
- TSH level



Infantile Hemangioma

Observation



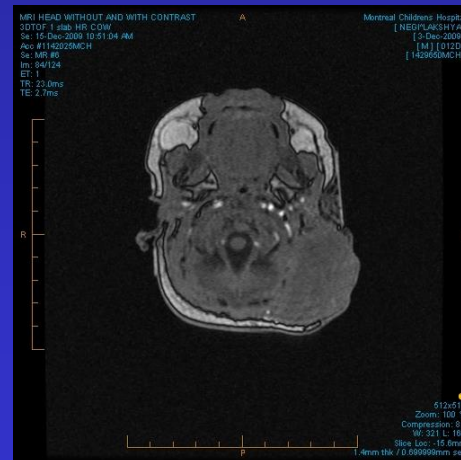
Rapidly Involuting Congenital Hemangioma

RICH

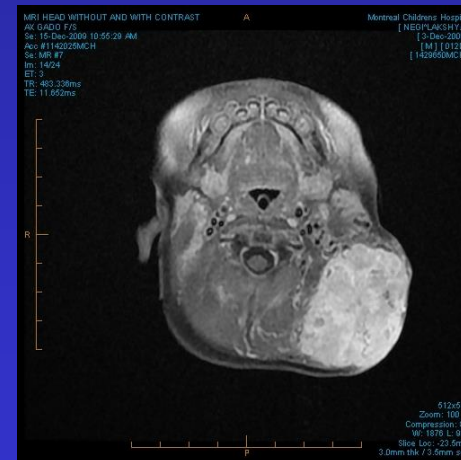
Birth



8 mo.



T 1



T 2



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Hemangioma of Infancy

Traditional Treatment Options

MEDICAL

- Steroids.
 - Systemic
 - Intralesional
- Vincristine.
 - For patients who have failed steroids.
 - Good response rates.
- Interferon.
 - Last resort due to high risk of neurotoxicity.

SURGICAL

- Laser
 - Effective for residual telangiectasia.
- Embolization
- Excision
 - Symptomatic lesions that fail medical therapy.
 - Revision of residual scars after involution.
 - Lesions that persist or grow atypically.
 - Lesions that can easily be removed.

Hemangioma of Infancy

The drug of serendipity

Propranolol for Severe Hemangiomas of Infancy

TO THE EDITOR: Despite their self-limited course, infantile capillary hemangiomas can impair vital or sensory functions or cause disfigurement. Corticosteroids are the first line of treatment for problematic infantile capillary hemangiomas^{1,2}; other options include interferon alfa³ and vincristine.¹ We have observed that propranolol can inhibit the growth of these hemangiomas. Our preliminary data from 11 children are summarized in Table 1 in the Supplementary Appendix, available with the full text of this letter at www.nejm.org.

The first child had a nasal capillary hemangioma. Despite corticosteroid treatment, the lesion was stabilized but obstructive hypertrophic myocardiopathy developed, so the patient was treated with propranolol. The day after the initiation of treatment, the hemangioma changed from intense red to purple, and it softened. The corticosteroids were tapered, but the hemangioma continued to improve. When the corticosteroids were discontinued, no regrowth of the hemangioma was noted. When the child was 14 months of age, the hemangioma was completely flat.

The second child had a plaque-like infantile capillary hemangioma involving the entire right upper limb and part of the face (Fig. 1). At 1 month of age, a subcutaneous component developed, and despite corticosteroid treatment, the hemangioma continued to enlarge. Magnetic resonance imaging revealed intraconal and extra-

conal orbital involvement, as well as an intracervical mass causing compression and tracheal and esophageal deviation (see the Supplementary Appendix). Ultrasonography showed increased cardiac output, and treatment with propranolol, at a dose of 2 mg per kilogram of body weight per day, was initiated. Seven days later, the child was able to open his eye spontaneously, and the mass near the parotid gland was considerably reduced in size. Prednisolone was discontinued at 4 months of age, without any regrowth of the hemangioma; at 9 months of age, the eye opening was satisfactory, and no major visual impairment was noted.

After written informed consent had been obtained from the parents, propranolol was given to nine additional children who had severe or disfiguring infantile capillary hemangiomas (see Table 1 in the Supplementary Appendix). In all patients, 24 hours after the initiation of treatment, we observed a change in the hemangioma from intense red to purple; this change was associated with a palpable softening of the lesion. After these initial changes, the hemangiomas continued to improve until they were nearly flat, with residual skin telangiectasias. Ultrasound examinations in five patients showed an objective regression in thickness associated with an increase in the resistive index of vascularization of the hemangioma (Table 1 in the Supplementary Appendix).

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Lymphatic Malformations

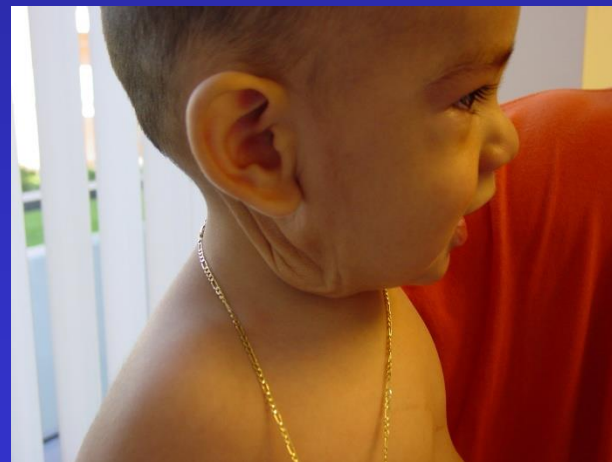
Observation



Birth



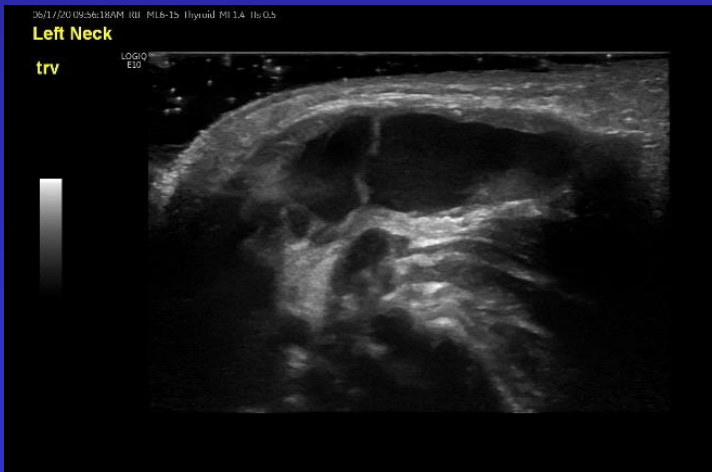
5 mo.



12 mo.

2 Week Old Girl

10 months



Lymphatic Malformations

Treatment



Case Presentation



- 18 month old girl
- Left submandibular mass growing over 8 weeks.
- Skin redness X 1 week.
- No fever or pain
- No PMH
- No travel history
- No contact history

Audience Polling

- The most likely diagnosis in the patient presented above is
 - A Staph aureus bacterial lymphadenitis
 - B Infected branchial cleft cyst
 - C Scrofula
 - D Non-tuberculous (atypical) bacterial lymphadenitis
 - E Lymphoma

Nontuberculous Mycobacterial Lymphadenitis

- Local infection without systemic involvement in immunocompetent hosts.
- Oropharynx is the portal of entry.
- Children age 1-5 years.
- Minimally tender, firm, rubbery, well-circumscribed, non-mobile.
- Overlying Skin changes.
- *Indolent.*

Mycobacterial Adenitis

- Mycobacterium tuberculosis (scrofula)

- + PPD skin test.
- Abnormal CXR.
- Contact history.

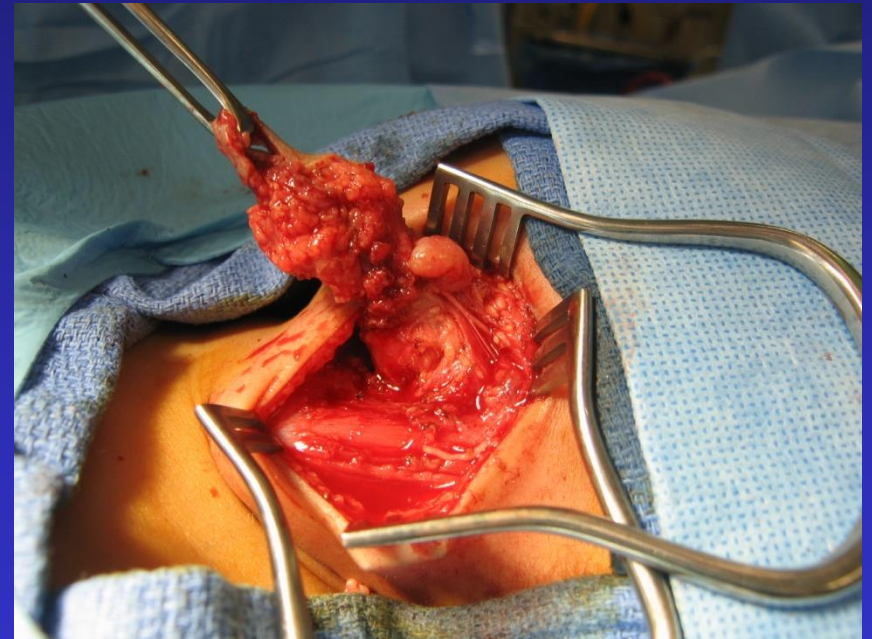
Rx: Multi-agent
antituberculous abx.

- Nontuberculous mycobacteria (atypical)

- + / - PPD.
- Normal CXR.
- No contact history.

Rx: Surgical resection.

Nontuberculous Mycobacteria



Case Presentation



- 5 year old girl
- 6 months history of small left eyelid mass
- Redness over 2-3 weeks.
- Heterogeneous firm non-tender lesion.

Audience Polling

- The most likely diagnosis in the patient presented above is
 - A Ingrown eyelid hair
 - B Sty
 - C Ruptured pilomatrixoma
 - D Ruptured inclusion cyst
 - E Dermoid

Pilomatrixoma

Calcifying Epithelioma of Malherbe

- Tumor of hair follicle
- Heterogeneous, firm, non-tender, bumpy
- Tethered to skin
- Dark discoloration of overlying skin
- Benign



Pilomatrixoma

Any hear-bearing area



Large Pilomatrixoma

6 year old girl



Synovial Cysts

“Ganglion”

- Typically asymptomatic
- High rate of spontaneous resolution in children
- High rate of recurrence with surgical excision
- Promising results with aspiration and steroid injection



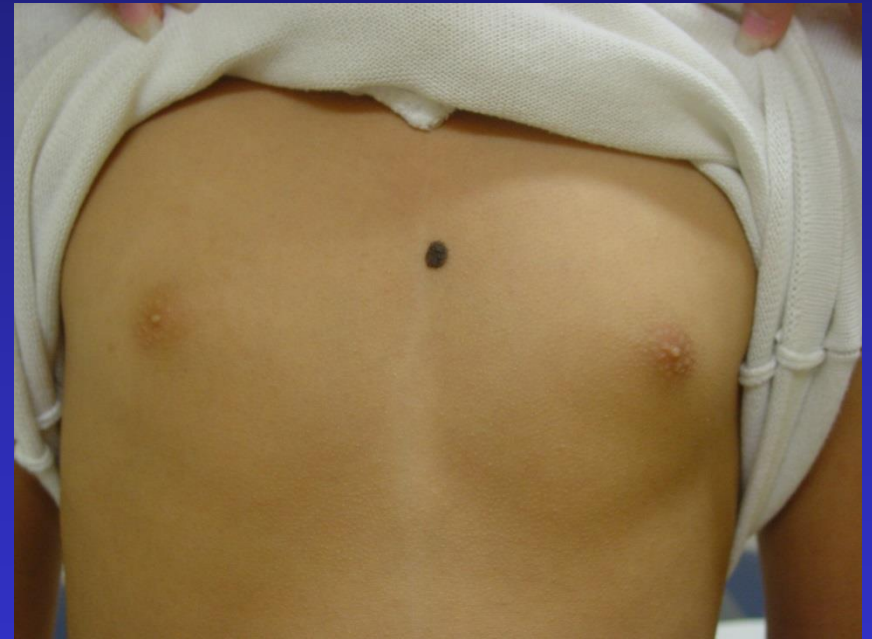
Case Presentation



- 2 year old girl
- 4 month history of increasing left breast mass.
- Solid discrete mass palpable under nipple.
- Strong family history of breast cancer.
- Next?

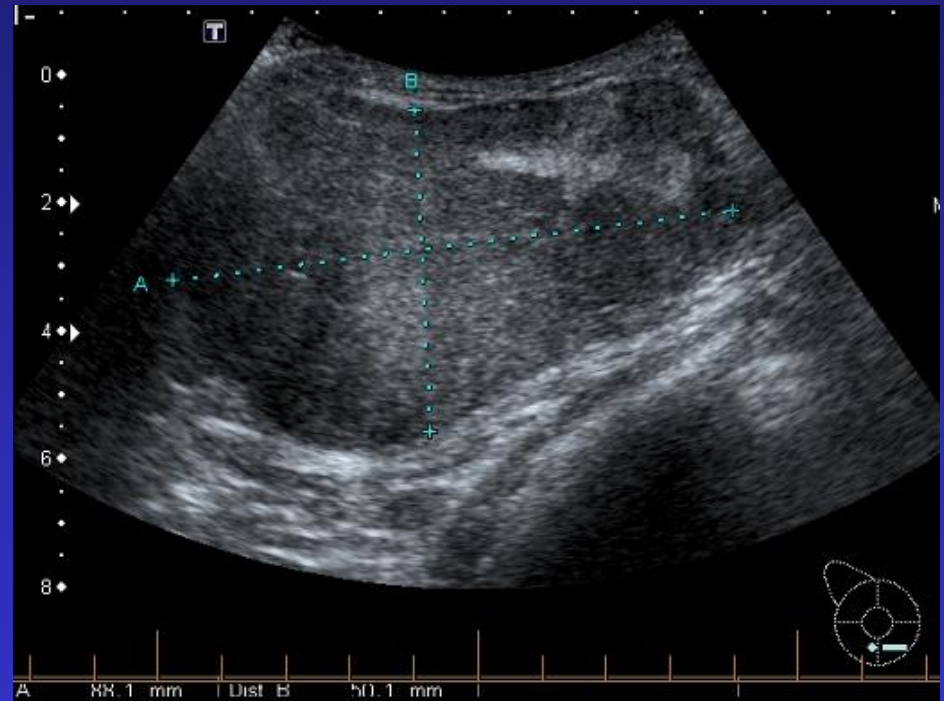
Pre-Pubertal Breast Bud

- 2 – 10 years of age
- Common in toddlers
- Round disc of tissue immediately underlying the nipple
- Unilateral
- Non-tender
- AVOID BIOPSY



Case Presentation

- 17 year old girl
- Slowly growing left breast mass over 1 year.
- Premenstrual breast discomfort.
- Exam: 6 cm discrete solid mass left breast.
- Next?



Fibroadenoma

- Most common breast mass in teenage girl
- Higher incidence in girls of African descent.
- Benign
- US diagnostic
- Observation an option for lesions < 3 cm.
- Excisional biopsy standard treatment



Umbilical Granuloma



Umbilical Granuloma

- Slow or delayed separation of the umbilical cord with granulation tissue displacing normal epithelial ingrowth
- Drying treatment with silver nitrate
- Lasso with tie
- Refer after one or two treatments

Soft Tissue Masses

Heightened Concern

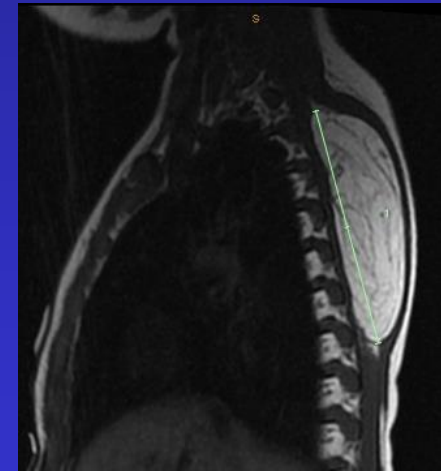
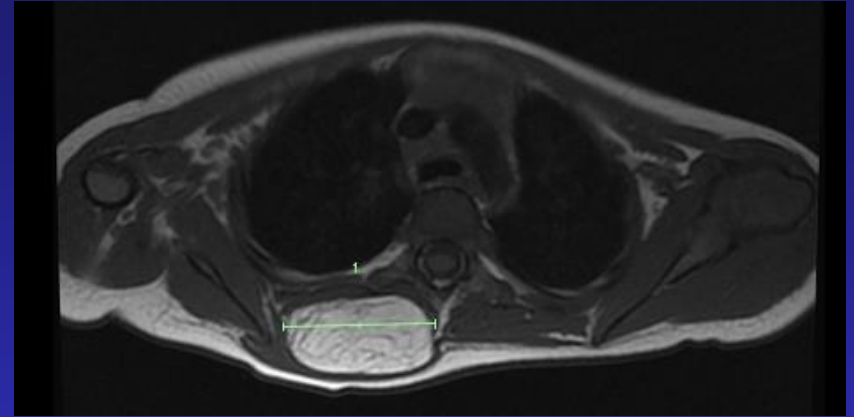
- Solid Mass
- Atypical Location
- Atypical Trajectory
- Is it fat?

Fatty Tumors

- Lipoma
- Fibrolipoma
- Lipofibromatosis
- Lipoblastoma

Lipoma

2-year old girl



Lipofibromatosis

Male Infant



Fibrolipoma

8-year old girl



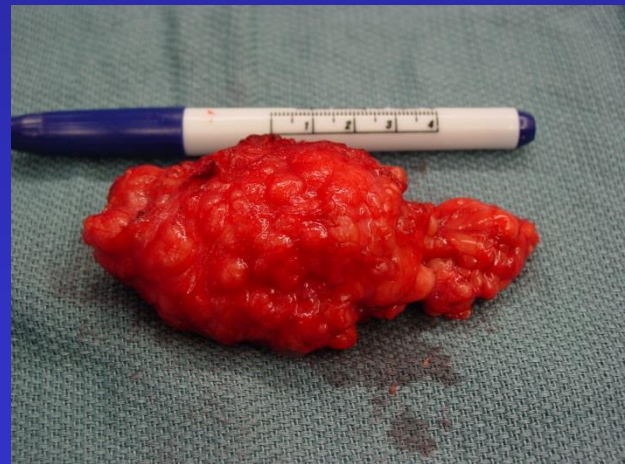
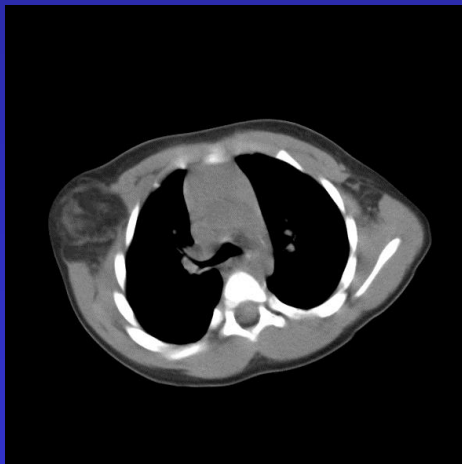
Lipoblastoma

16-year old boy



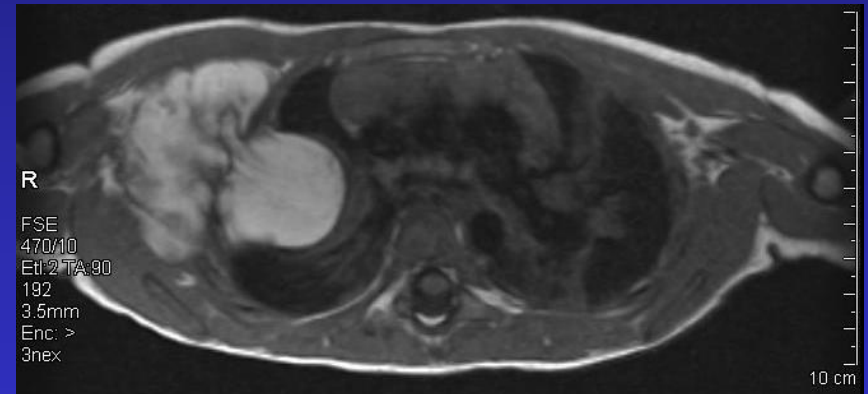
Lipoblastoma

2-year old boy



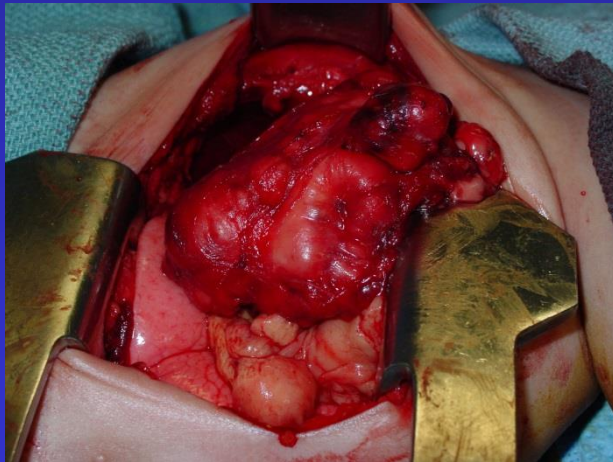
Lipoblastoma

2-year old boy



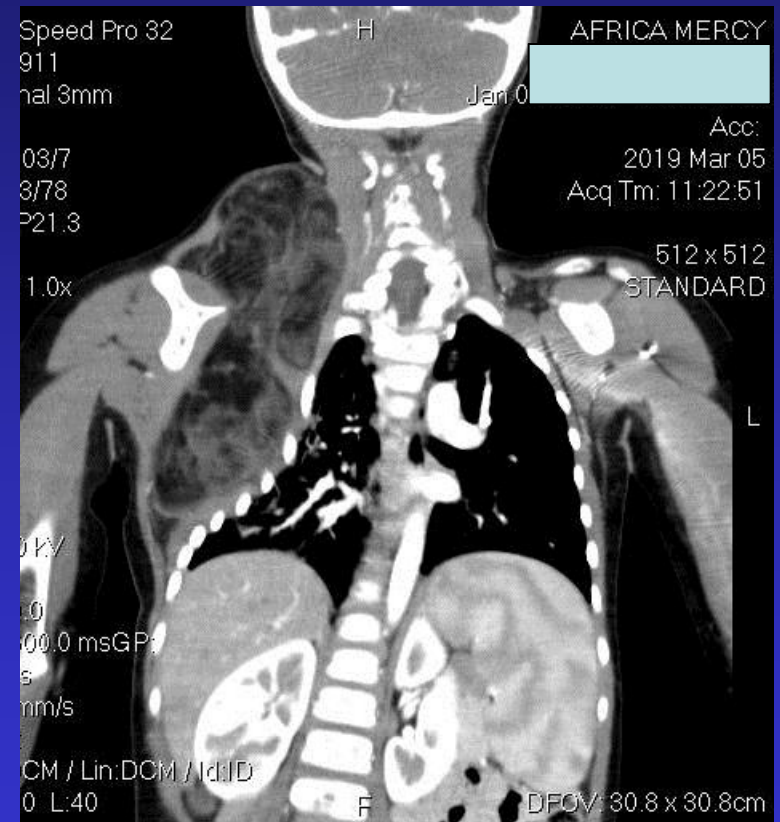
Lipoblastoma

2-year old boy



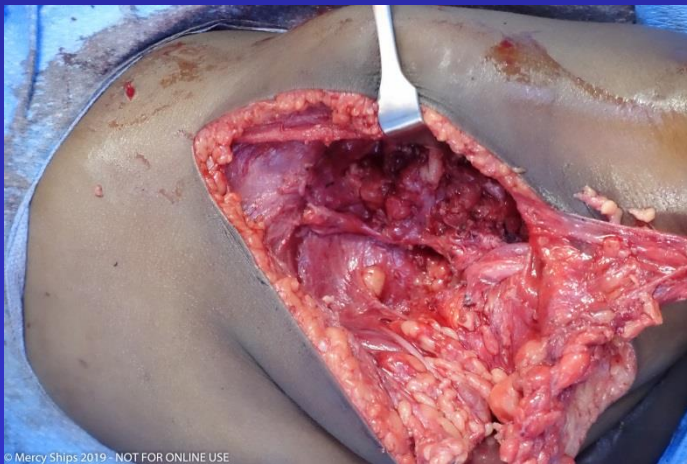
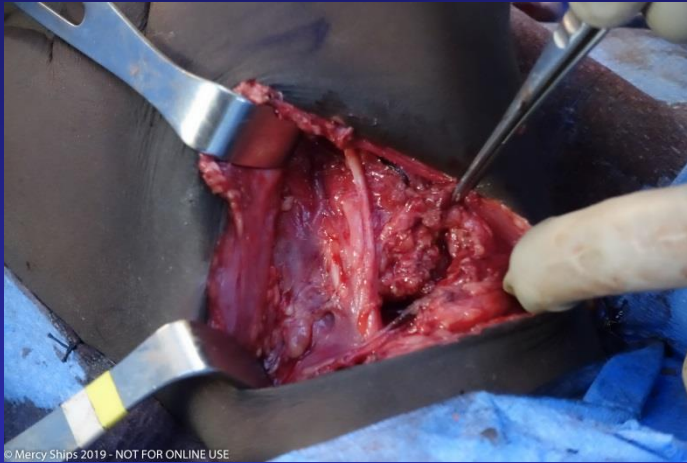
Lipoblastoma

4-year old girl



Lipoblastoma

4-year old girl



Malignant Soft Tissue Masses

- Rhabdomyosarcoma
- Neuroblastoma
- Ewing Sarcoma
- Undifferentiated Sarcoma
- T-Cell Lymphoma

Malignant Soft Tissue Masses

Characteristics

- Rapid growth.
- Asymptomatic mass.
- Solid.
- Non-mobile.
- Atypical location.
- Skin involvement.

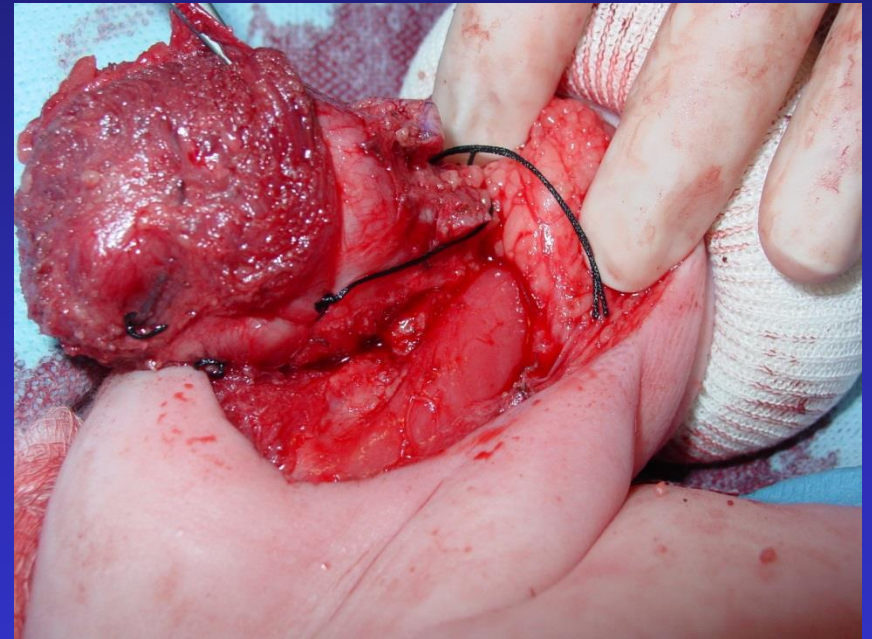
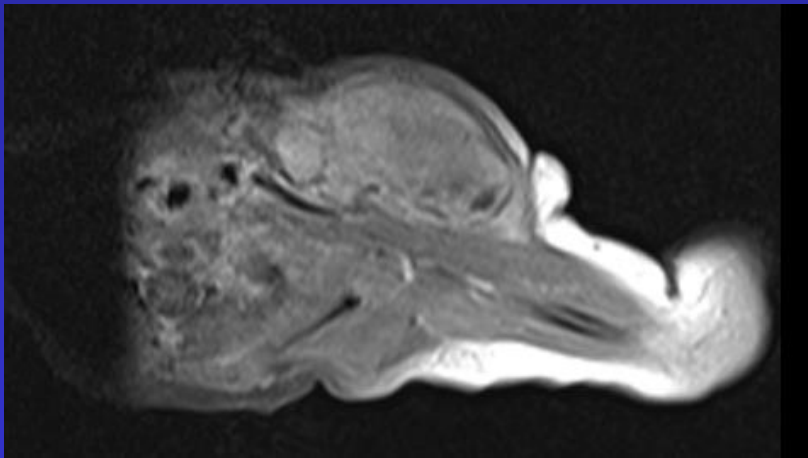
Malignant Soft Tissue Masses

Work-Up

- Ultrasound
- MRI
- Biopsy
 - Core
 - Incisional
 - Excisional
- Pathology

Rhabdomyosarcoma

2-week old girl



Rhabdomyosarcoma

4-year old boy

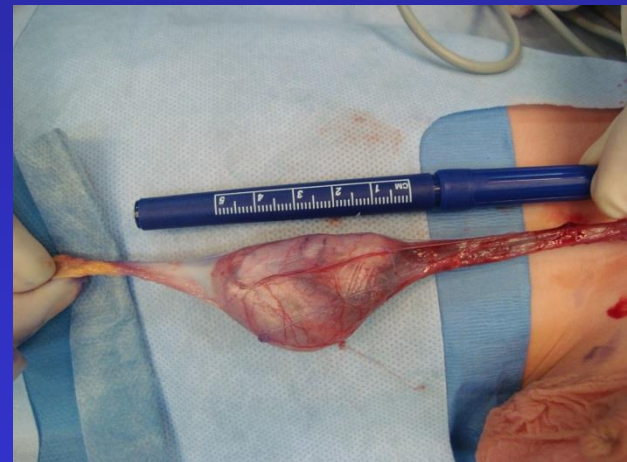


Paratesticular RMS

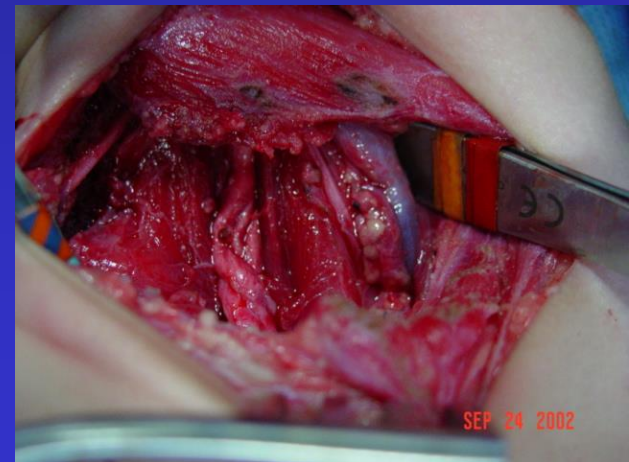
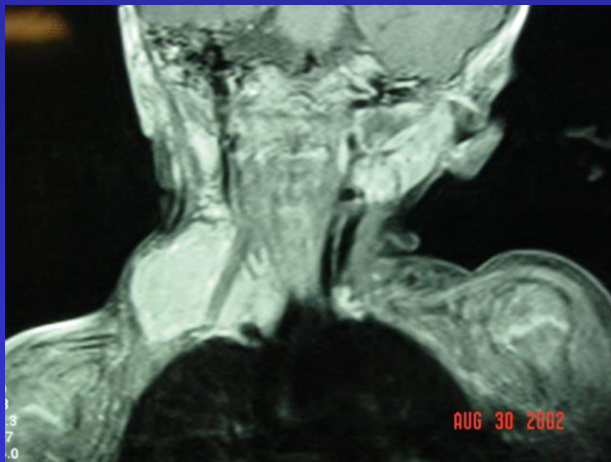
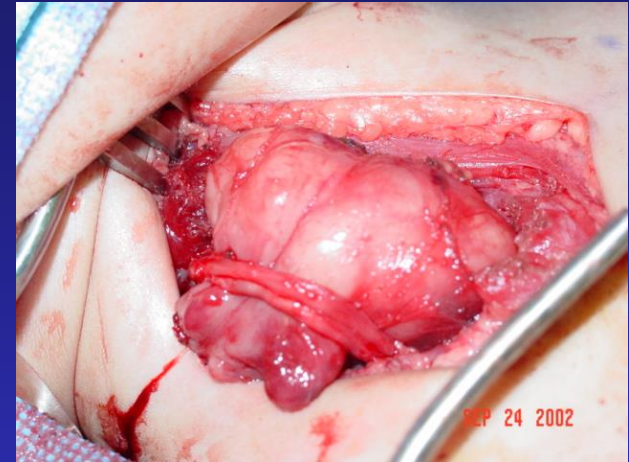
4-month old boy



8-year old boy



Cervical Neuroblastoma



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Ewing Sarcoma

7-year old boy



Undifferentiated Sarcoma

6-month old boy



Undifferentiated Sarcoma

6-month old boy



Undifferentiated Sarcoma

6-year old girl



Undifferentiated Sarcoma

6-year old girl



T-Cell Lymphoma

14-year old girl



Precision Medicine

Premature Infant



Myofibroma

Evolution Post Biopsy

Age 2 months



Age 4 years



Summary

- Most soft tissue masses are benign, occur in typical locations, and have typical presentations.
- A high index of suspicion should exist for soft tissue masses in atypical locations or with atypical presentations.
- Expedited imaging and biopsy should be employed for suspicious solid masses.

Thank You!

Merci!



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Thank You!

Merci!

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