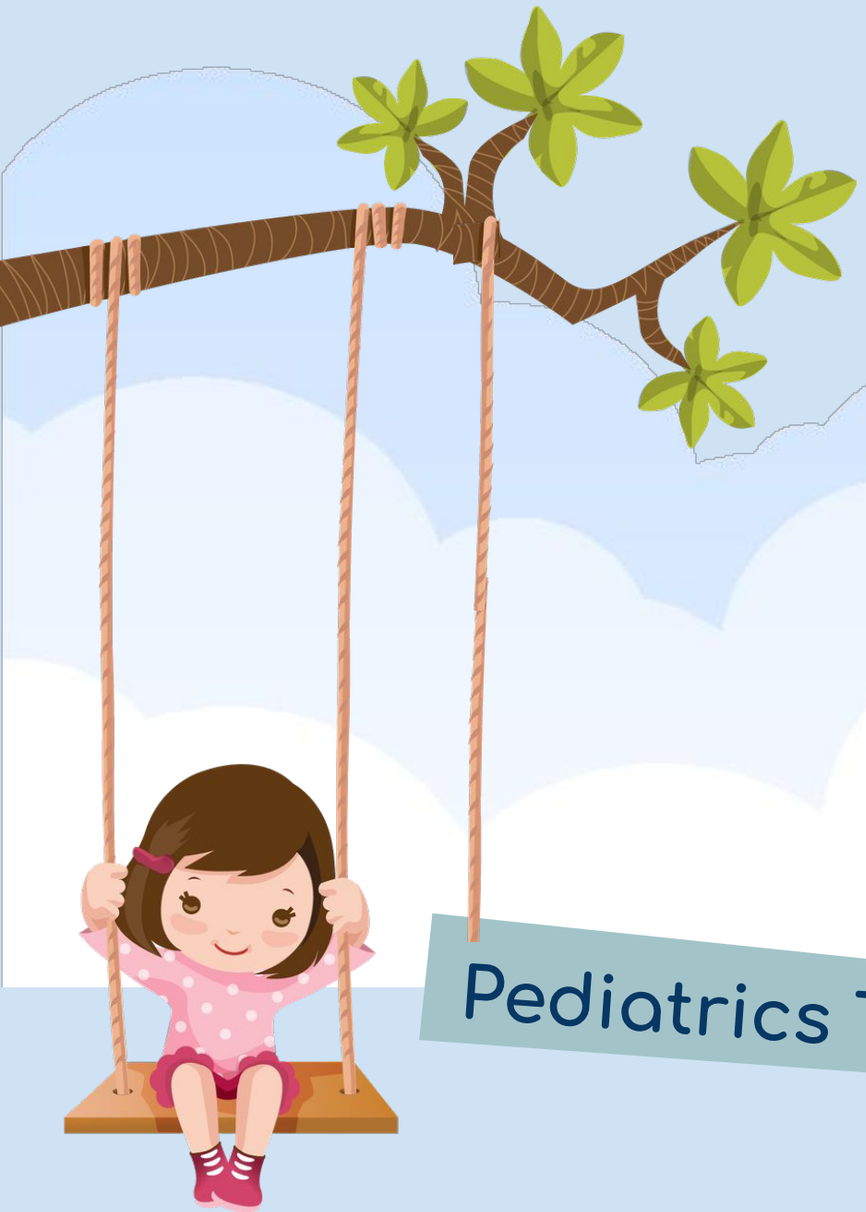

Pediatrics TeamWork

437

Approach to lymphadenopathy & Hepatosplenomegaly

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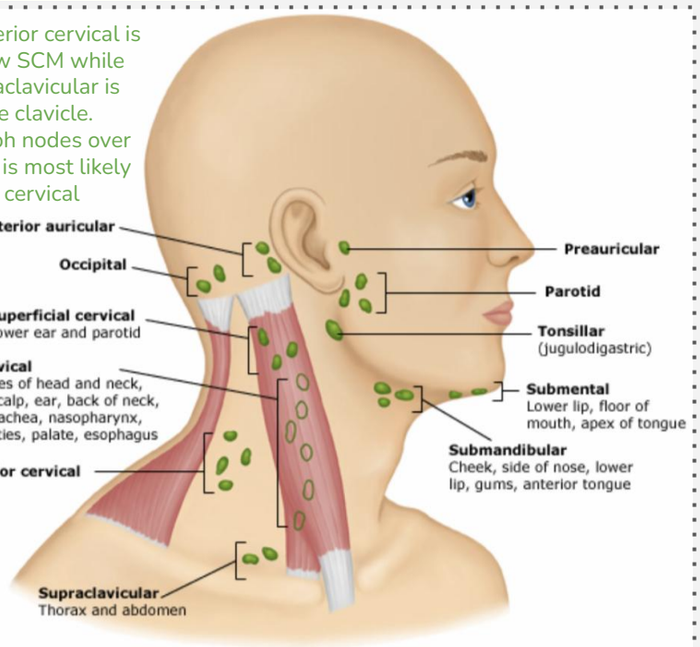
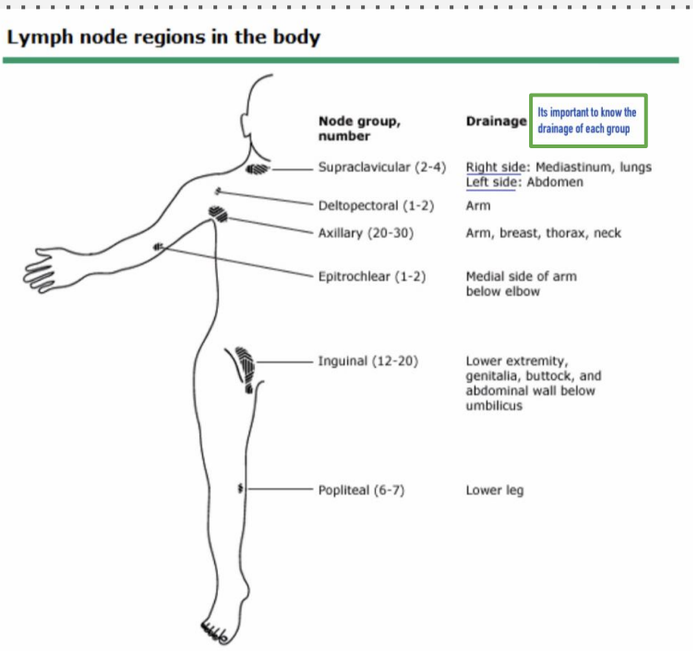
Notes | Previous Notes | Book | Important!

Lymphadenopathy

Anatomy of LN:

Posterior cervical is below SCM while supraclavicular is above clavicle. Lymph nodes over SCM is most likely deep cervical





- Palpable lymph nodes are normal in anterior cervical, axillary and inguinal regions in healthy children
- Lymphadenopathy: enlargement of the lymph nodes beyond this normal state. Practically this is any node >1.0 cm in greatest diameter.
- Certain nodes should be considered enlarged at different sizes (i.e. epitrochlear nodes > 0.5 cm, inguinal nodes >1.5 cm, submandibular nodes > 1. 5 cm)

Definitions

- Acute Lymphadenopathy: < 2 weeks duration.
- Subacute Lymphadenopathy: 2-6 weeks duration
- Chronic Lymphadenopathy: > 6 weeks duration

Generalized lymphadenopathy is enlargement of two or more non contiguous lymph node groups regional lymphadenopathy involves one lymph node group only.

Causes:

Infections Most common	
Bacterial	
Localized	Streptococcal pharyngitis; skin infections; tularemia; cat scratch disease; diphtheria;
Generalized	Brucellosis; leptospirosis; typhoid fever.
Viral very common	Epstein-Barr virus; herpes simplex virus; cytomegalovirus; mumps; measles; rubella; HIV, hepatitis B; dengue fever. EBV, CMV and MMR are the most common in pediatrics!
Mycobacterial	Mycobacterium tuberculosis; atypical mycobacteria
Fungal	Histoplasmosis; coccidioidomycosis; cryptococcosis. Especially in immunocompromised
Protozoal	Toxoplasmosis, Leishmaniasis
Neoplastic	Leukemia, metastatic, lymphoma (HL and NHL), hemophagocytic lymphohistiocytosis (HLH important cause in peds)
Autoimmune	SLE, JRA, serum sickness
Drugs	phenytoin, Hydralazine, Allopurinol, Pyrimethamine, Isoniazid
Miscellaneous	Sarcoidosis; lipid storage diseases; amyloidosis; histiocytosis; chronic granulomatous diseases

Infectious causes of cervical lymphadenitis in children

You dont need to know this

Presentation	Common	Uncommon	Rare
Acute bilateral	Rhinovirus Epstein-Barr virus*• Cytomegalovirus*• Herpes simplex virus Adenovirus Enterovirus *Mycoplasma pneumoniae* Group A streptococcus Influenza	Roseola• Parvovirus B19•	*Corynebacterium diphtheriae* Rubella• Measles Mumps•
Acute unilateral Common	*Staphylococcus aureus* Group A streptococcus Anaerobic bacteria Seen with dental issues like carries	Group B streptococcus Tularemia* Alpha streptococcus *Pasteurella multocida* *Yersinia pestis*• Gram-negative bacilli	*Yersinia enterocolitia** Anthrax
Chronic unilateral	Nontuberculous *Mycobacterium* Cat scratch disease	Toxoplasmosis• Tuberculosis• Actinomycosis	*Nocardia brasiliensis* Aspergillosis Sporotrichosis
Chronic bilateral	Epstein-Barr virus Cytomegalovirus•	HIV• Toxoplasmosis• Tuberculosis• Syphilis•	Brucellosis• Histoplasmosis•

HIV: human immunodeficiency virus.
* Infection can persist and become more chronic in appearance.
• Often associated with generalized lymphadenopathy.

-Acute bilateral is mostly viral cause while unilateral is bacterial. Chronic unilateral is also **usually** (not all) bacterial
-Cervical lymphadenitis is the most common regional lymphadenitis among children and is associated most commonly with pharyngitis caused by group A streptococcus, respiratory viruses, and Epstein- Barr virus (EBV).
-EBV primarily affects B lymphocytes and is the cause of infectious mononucleosis, a clinical syndrome characterized by fever, fatigue and malaise, cervical or generalized lymphadenopathy, tonsillitis, and pharyngitis.
-CMV, Toxoplasma, adenoviruses, hepatitis B virus, hepatitis C virus, HIV infection, known as acute retroviral syndrome, can cause an infectious mononucleosis-like syndrome with lymphadenopathy.

Causes of localized lymphadenopathy in children

Lymph node group	Area of drainage	Causes
Occipital	Posterior scalp, neck	Common: Scalp infections (including tinea capitis, lice), insect bites, seborrhea, roseola (human herpesvirus 6, HHV6) Less common: Rubella, acute lymphoblastic leukemia
Posterior auricular	Temporal and parietal scalp	Rubella, roseola (HHV6, HHV7)
Anterior auricular (preauricular)	Anterior and temporal scalp, anterior ear canal and pinna, lateral conjunctiva and eyelids	Common: Eye or conjuctival infections (eg, adenovirus, oculoglandular syndrome) Less common: Cat scratch disease, tularemia, listeriosis
Submental	Central lower lip, floor of mouth	Tongue, gum, buccal mucosal, and dental infections (eg, gingivostomatitis), group B streptococcal infection (in infants <2 months of age)
Submaxillary (submandibular)	Cheek, nose, lips, anterior tongue, submandibular gland, buccal mucosa	Tongue, gum, buccal mucosal, and dental infections; dental caries; chronically cracked lips
Cervical	Cranium, neck, oropharynx	**Anterior:** Common: Viral upper respiratory infections, infections of pharynx, oral cavity, or head and neck; primary bacterial adenitis, tuberculosis, Epstein-Barr virus, cytomegalovirus, cat scratch disease, tularemia, nontuberculous mycobacterium, mycobacterium tuberculosis Less common: Kawasaki disease, tularemia, toxoplasmosis, non-infectious causes (eg, Hodgkin's disease, lymphosarcoma, neuroblastoma, rhabdomyosarcoma, sarcoidosis) **Posterior:** Toxoplasmosis, Epstein-Barr virus, rubella
Supraclavicular	Right: Inferior neck and mediastinum Left: Inferior neck, mediastinum, and upper abdomen	Malignancy (lymphoma or metastatic disease)
Axillary	Greater part of arm, shoulder, superficial anterior and lateral thoracic and upper abdominal wall	Common: Cat scratch disease, pyogenic infections of upper arms, brucellosis, reactive response to disruption in skin integrity Less common: Brucellosis, Yersinia pestis, rat-bite fever, toxoplasmosis, rheumatologic disease of the hand or wrist
Epitrochlear	Hand, forearm, elbow	Common: Viral diseases, sarcoidosis, tularemia, infection of hands Less common: Cat scratch disease, tularemia, secondary syphilis, rheumatologic disease of the hand or wrist
Inguinal	Leg and genitalia	Common: Genital herpes, primary; syphilis, gonococcal infection, lymphoma Less common: Yersinia pestis, chancroid, lymphogranuloma venereum
Popliteal	Posterior leg and knee	Local infection

Data from:
1. *Segal GB, Hall CB. Lymphadenopathy. In: Primary Pediatric Care, 4th ed, Hoekelman RA (Ed), Mosby, St. Louis 2001. p.1192.*
2. *Perkins SL, Segal GH, Kjeldsberg CR. Work-up of lymphadenopathy in children. Semin Diagn Pathol 1995; 12:284.*
3. *Malley R. Lymphadenopathy. In: Textbook of Pediatric Emergency Medicine, 5th ed, Fleisher GR, Ludwig S, Henretig FM (Eds), Lippincott Williams and Wilkins, Philadelphia 2006. p.421.*

According to dr we are not expected to memorize but read it.

Please don't skip anything, exam questions are done by exam committee

History and physical examination

The history and physical examination are particularly important in determining the differential diagnosis and ultimately the timing, workup and treatment of lymphadenopathy.

- **History**

➢ **Duration**
❑ Short (< 2 weeks) -likely to be infectious.
❑ Long (> 2 weeks but < 1 year) -likely to be infectious (TB), malignancy, autoimmune, drug reaction.

Know the size, if there is a change in size over time; increase or regression

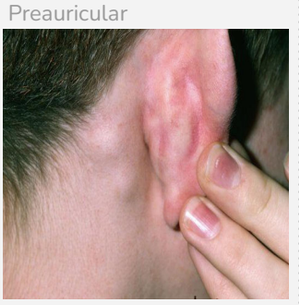
➢ **Location**
❑ Localized: likely to be infectious.
❑ Generalized more likely pathologic (e.g. malignancy, autoimmune, etc.).
❑ Head and Neck: likely infectious.
❑ Mediastinal: likely pathologic.
❑ Abdominal: likely pathologic.
❑ Inguinal: likely infectious.

➢ **Associated symptoms-each may be associated with infectious, malignant, autoimmune, or immunodeficiency diseases:**
❑ Pain. infection
❑ Sore Throat infection
❑ URI infection
❑ Toothache infection
❑ Ear pain infection
❑ Fever
❑ Weight loss (> 10% over 6 months) malignancy
❑ Night sweats malignancy
❑ Pruritus malignancy
❑ Myalgia/arthralgia Rashes infection, autoimmune
❑ Malaise

➢ **Other history:**
❑ Pets - especially cats for Cat Scratch Disease
❑ Travel - including Tuberculosis exposure
❑ Possible immunodeficiency risk such as HIV (go back to child with recurrent infection lecture!)
❑ Family history of similar problems
❑ Previous treatments (such as antibiotics and how patient responded)

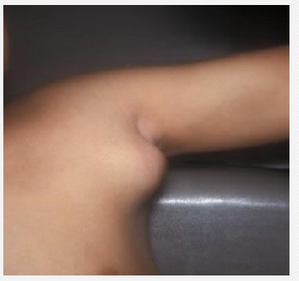
What are parents most worried about?

Preauricular



Lymph nodes of viral infections are usually soft

We used to see this a lot 1-2 months after BCG vaccination, now they modified it and we no longer see this. This is axillary!

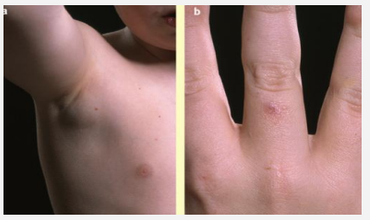


- **Physical examination**

➢ **Nodes:**
❑ Location -local, regional, generalized
❑ Size
❑ Character- e.g. firm,soft, etc. (may be subjective)
❑ Fixed or non-fixed
❑ Erythema and tenderness

➢ **Notes:**
❑ Generalize, firm, discrete, non-tender, fixed tend to be more ominous causes such as malignancy
❑ Localized, warm, tender, matted, erythematous -tend to be associated with infections

➢ General: Febrile or toxic appearing
➢ Skin: Cellulitis, impetigo, rash
➢ HEENT: Otitis, pharyngitis, teeth, and nasal cavity
➢ Lungs: Consolidations suggesting TB
➢ Abdomen: Hepatosplenomegaly. This will change your ddx



This is cat scratch disease, sometimes even the preauricular nodes get involved.

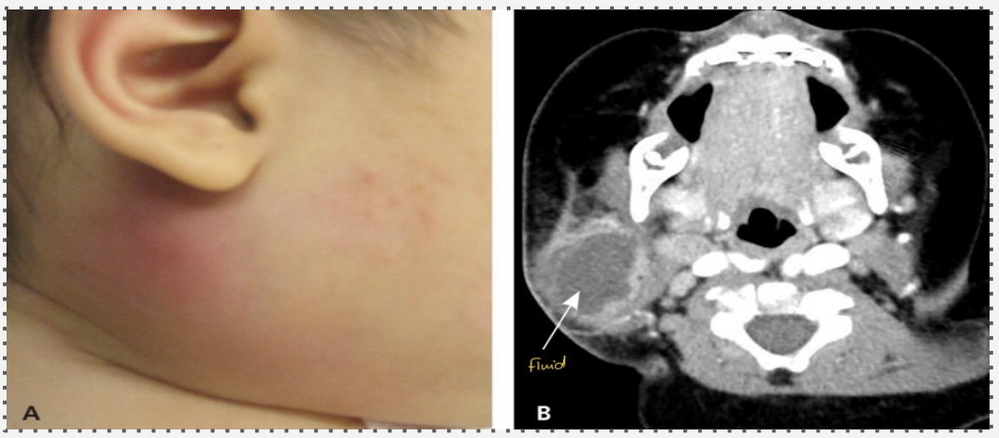
➢ **Worrying Signs**

- ❑ lymphadenopathy of more than 3 cm (it means is progressive), size more than 4 weeks in duration
- ❑ supraclavicular, post. cervical involvement
- ❑ Skin tethering / ulceration (it could be malignancy)
- ❑ Fixed nodes why? Because it means the process is infiltrative, reaching the subcutaneous tissue or even skin. Malignancy
- ❑ Firm/rubbery consistency malignancy
- ❑ abnormal laboratory and radiological findings: ESR is elevated for example malignancy or very serious infection like TB. Mediastinal widening on cxr >> malignancy

➢ **Other signs:** these can lead you to underlying cause

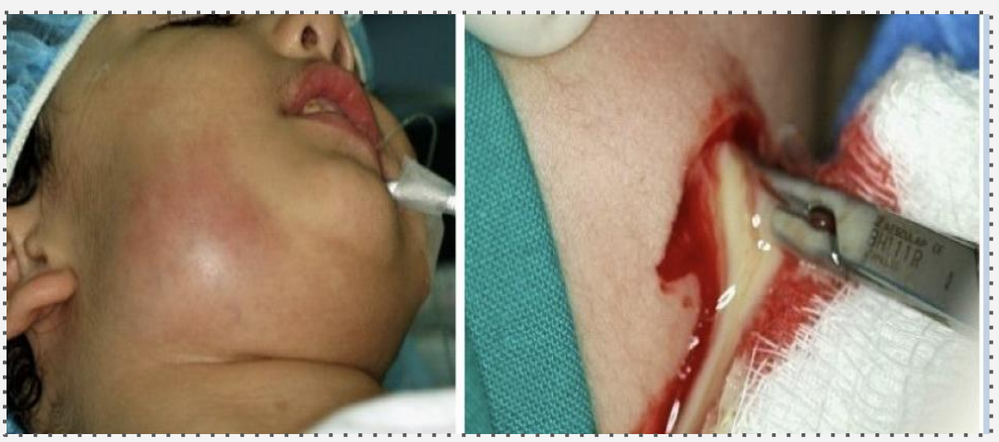
- ❑ Signs of anemia (suggest chronic illness)-tachycardia, pale conjunctiva -may be associated with malignancy, autoimmune diseases
- ❑ Dermatological changes -petechiae, bruising, bleeding -may be associated with malignancy
- ❑ Weight/growth -poor growth may be associated with malignancy.

Acute suppurative lymphadenitis



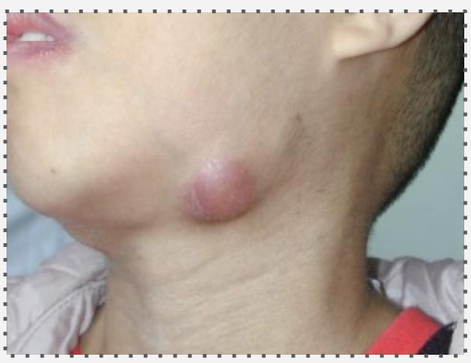
1)This is most likely submandibular, the surrounding area is diffusely swollen. This picture is different from dr slide, in dr slides there was ulceration in the swelling and it was huge but same location

2) You can see fluid in this CT scan, so this is acute suppurative lymphadenitis, we don't usually order a CT scan unless we're looking for something else. Ultrasound is enough, you can also feel for fluctuation. If you see fluid in US call surgery immediately. This is the most common cause of lymphadenopathy in pediatrics that we see



Suppurative cervical lymphadenitis, frequently caused by S. aureus or group A streptococcus, shows erythema and warmth of the overlying skin with moderate to exquisite tenderness.

Atypical mycobacteria

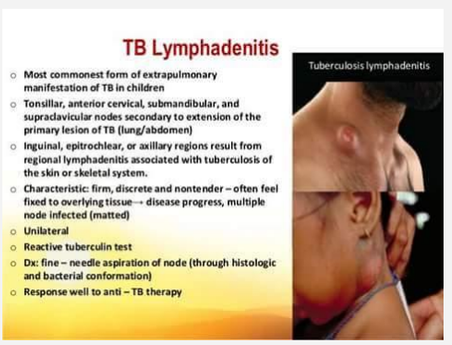


The local reaction is circumscribed, and overlying skin may develop a violaceous discoloration without warmth. Fever and systemic symptoms are minimal or absent.

The recommended treatment of cervical lymphadenitis caused by nontuberculous mycobacteria is complete surgical excision. Antimycobacterial drugs are necessary only if there is recurrence or inability to excise infected nodes completely, or if M. tuberculosis is identified, which requires 6 months of antituberculous chemotherapy

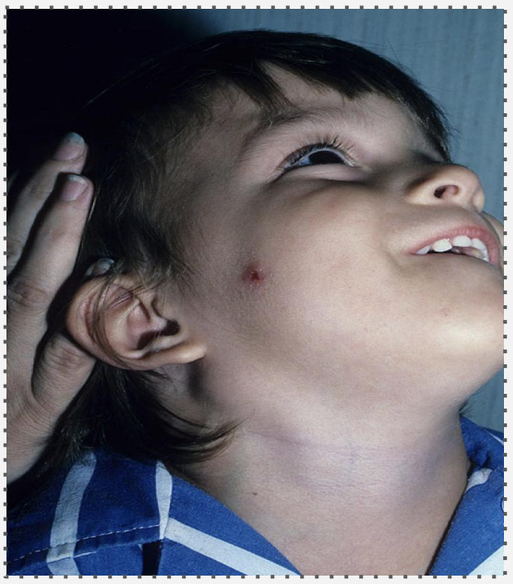
Mycobacterium species commonly causing lymphadenitis in children includes M. avium complex, M. scrofulaceum, and M. kansasii.

This is a more localized process, not surrounded by swelling or edema, in an older child. This is a case of atypical mycobacteria. It is not painful, occurs in older children (>5), no constitutional symptoms.



Read it!

Facial Papule with Adenopathy



Cat scratch disease (dr. Elham said it is likely in face but it could be; think of other bacterial causes as well)
This is another example of cat scratch disease, the scratch can be on hands, face or not visible. Here you can see a papule an an enlarged draining cervical node.

The cause of cat-scratch disease is B. henselae, a gram-negative bacillus that stains with Warthin- Starry silver stain. It is transmitted to humans by bites and scratches. B. henselae also causes bacillary angiomatosis and peliosis hepatis in persons with HIV infection.

Cat-scratch disease typically presents with a cutaneous papule or conjunctival granuloma at the site of bacterial inoculation, followed by lymphadenopathy of the draining regional nodes. The nodes are tender, with suppuration in approximately 10% of cases.

Cat-scratch disease usually does not require treatment because the lymphadenopathy resolves in 2 to 4 months without sequelae.

Azithromycin may hasten resolution and reduces node size at 30 days but no benefit is evident at 90 days. Aspiration is indicated for suppurative nodes.

Mimickers of lymphadenopathy

- **Thyroglossal duct cyst:** Moves with tongue protrusion and is midline.
- **Dermoid Cyst:** Midline and often has calcifications on plain films.
- **Branchial Cyst:** Smooth and fluctuant along SCM border.
- **Hemangioma**: Mass is presents after birth, rapidly grows, plateaus, and is red or bluish in color.
- **Cystic Hygroma:** Transilluminates and is compressible
- **Sternocleidomastoid Tumor**:(not a true tumor, it is usually to birth trauma to the sternocleidomastoid then area gets fibrosed and presents as a lump) Presents with torticollis, lymphadenopathy does not
- **Mumps**: Mass palpated superior to jaw line, not just inferior to it. We frequently get ER calls for mums then we only find the swelling to be submandibular. In mumps you should feel it above the jawline

When to investigate?

Patients generally should be considered for investigation and/or referral if:

- Unexplained generalized lymphadenopathy
- Any palpable supraclavicular or popliteal node
- Significant constitutional symptoms
- Hepatic or splenic enlargement
- Anemia or bleeding
- Unresponsiveness to antibiotic treatment
- Not decreasing in size after appropriate period of observation

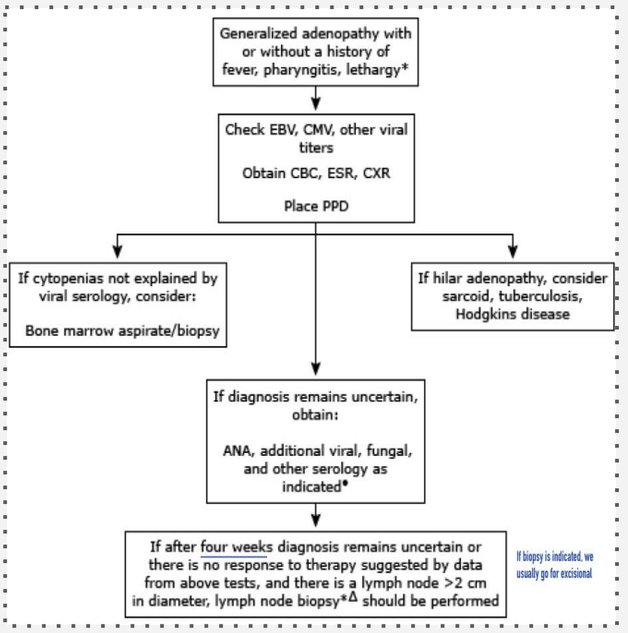
Treatment: acute unilateral bacterial lymphadenopathy >> antibiotic targeting organism. Treat accordingly! Unilateral, child doing well and no fever >> oral antibiotics (e.g. amoxicillin) without admission. **When to admit?** When there is a worrying sign!

Workup

Laboratory workup (you order accordingly)	Imaging workup
CBC with Differential Looking for anemia and bone marrow involvement. Leukocytosis for infection ESR/CRP CRP is more specific, ESR is an acute reactant seen even in autoimmune processes, whereas CRP is more specific to bacteria infection. Throat swab Serology (EBV, Bartonella (cat scratch disease), CMV, Toxoplasmosis)(bilateral, chronic, generalized) PPD (Mantoux test) TB LDH malignancy Uric acid malignancy LFT In the case of hepatosplenomegaly, changes in LFTs are seen with CMC and EBV but only in hundreds, unlike the thousands seen with viral hepatitis. Blood culture: if significant fever and a sick child	**CXR**: look for mediastinal lymphadenopathy hilar lymphadenopathy is diagnosed by either X ray or CT, we start with CXR **Ultrasound**: To evaluate for or follow progress of an abscess, and to assess the consistency. suspect malignancy **CT- scan** generalized **(see next slide for orange table)** **Biopsy**: FNA or Excisional, **Early biopsy is indicated in children with supraclavicular, mediastinal, or massively enlarged nodes or groups of nodes >3 cm.** Looking for malignancy

Table 3. Indications for Ordering Clinical Laboratory or Imaging Studies in the Workup of a Child with a Neck Mass

Test	*Indication*
Bartonella henselae titers	Recent exposure to cats
Complete blood count	Serious systemic disease suspected (e.g., leukemia, mononucleosis)
Computed tomography	Imaging study for retropharyngeal or deep neck abscess, or suspected malignancy
Magnetic resonance imaging	Preferred if vascular malformation is suspected
Purified protein derivative (PPD) test for tuberculosis	Exposure to tuberculosis, young child in rural community (atypical tuberculosis)
Ultrasonography	Recommended initial imaging study for a developmental mass, palpable mass, or suspected thyroid problem
Viral titers (cytomegalovirus, Epstein-Barr virus, human immunodeficiency virus, toxoplasmosis)	If history suggests exposure or a suspected inflammatory mass is not responding to antibiotics



Hepatosplenomegaly

What You Need to Know?

- fatigue
- pain in the abdomen
- **Other symptoms, which may be severe, include:**

➢ abdominal pain in the upper-right region
➢ tenderness in the right region of the abdomen
➢ nausea and vomiting
➢ swelling of the abdomen
➢ fever
➢ persistent itching
➢ jaundice, indicated by yellow eyes and skin
➢ brown urine
➢ clay-colored stool

Causes

Infections

➢ acute viral hepatitis
➢ infectious mononucleosis, also known as glandular fever or the "kissing disease" and caused by the Epstein-Barr virus
➢ cytomegalovirus, a condition in the herpes virus family
➢ brucellosis, a virus transmitted via contaminated food or contact with an infected animal
➢ malaria, a mosquito-borne infection that can be life-threatening
➢ leishmaniasis, a disease caused by the parasite Leishmania and spread through the bite of a sand fly
➢ schistosomiasis, which is caused by a parasitic worm infecting the urinary tract or intestines
➢ septicemic plague, which is caused by a Yersinia pestis infection and can be life- threatening

Hematological diseases

- myeloproliferative disorders, in which the bone marrow produces too many cells
- leukemia, or cancer of the bone marrow
- lymphoma, or a blood cell tumor originating in lymphatic cells
- sickle cell anemia, a hereditary blood disorder found in children in which hemoglobin cells are not able to transfer oxygen
- thalassemia, an inherited blood disorder in which hemoglobin is formed abnormally
- myelofibrosis, a rare cancer of the bone marrow

Metabolic diseases

- Niemann-Pick disease, a severe metabolic disorder involving fat accumulation in cells
- Gaucher's disease, a genetic condition that causes fat accumulation in different organs and cells
- Hurler syndrome, a genetic disorder with increased risk of early death through organ damage

Other conditions

- chronic liver disease, including chronic active hepatitis
- amyloidosis, a rare, abnormal accumulation of folded proteins
- systemic lupus erythematosus, the most common form of the autoimmune disease lupus
- sarcoidosis, a condition in which inflammatory cells are seen in different organs
- trypanosomiasis, a parasitic disease transmitted via the bite of an infected fly
- multiple sulfatase deficiency, a rare enzyme deficiency
- osteopetrosis, a rare inherited disorder in which bones are harder and denser than normal

Diagnosis

These are a number of tests that your doctor may order to help make a definitive diagnosis of hepatosplenomegaly. These are:

- an ultrasound, which is typically recommended after an abdominal mass is found during a physical exam
- a CT scan, which can reveal an enlarged liver or spleen as well as surrounding organs
- blood tests, including a liver function test and a blood clotting test an MRI scan to confirm diagnosis after physical examination

Treatment

Treatments for hepatosplenomegaly can vary from person to person depending on the cause of the condition

Complications

The most common complications of hepatosplenomegaly are:

- bleeding
- blood in stool
- blood in vomit
- liver failure
- encephalopathy

Extra

Acute cervical lymphadenitis	• Acute cervical lymphadenitis as a complication of group A streptococcal infection parallels the incidence of streptococcal pharyngitis. • Empirical treatment targeting S. aureus and group A streptococcus includes a penicillinase-resistant penicillin (e.g., oxacillin) or first- generation cephalosporin (e.g., cefazolin). For patients with hypersensitivity to β-lactam antibiotics, or if community-acquired methicillin resistant S. aureus is suspected, clindamycin is appropriate.
Infectious mononucleosis	• Infectious mononucleosis is characterized by lymphocytosis with atypical lymphocytes; thrombocytopenia and elevated hepatic enzymes are common. • The most reliable test for diagnosis of acute EBV infection is the IgM antiviral capsid antigen. Heterophile antibody is also diagnostic but is not reliably positive in children younger than 4 years with infectious mononucleosis • There is no specific treatment for infectious mononucleosis • Infectious mononucleosis usually resolves in 2 to 4 weeks, but fatigue and malaise may wax and wane for several weeks to months. • Corticosteroids have been used for respiratory compromise resulting from tonsillar hypertrophy, which responds rapidly, and for thrombocytopenia, hemolytic anemia, and neurologic complications.

Cases

1) A 2- year- old boy brought to the clinic with fever and sided neck swelling for 3 days.

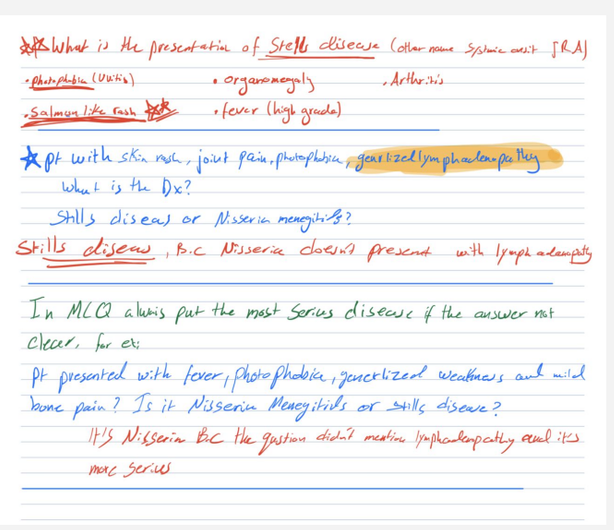
What are the likely etiologies? Acute unilateral, most likely infectious. Could be viral or bacterial.
What points in history will be suggestive of each etiology?
What points in physical examination relevant to each possible etiology?
What are the appropriate investigations helpful in reaching a diagnosis?

An 8 – year – old patient with left cervical lymphadenopathy for the past 4 weeks. Subacute, older child, you'll need to obtain a full Hx
What are the likely etiologies? (mention at least 3)
What points in history will be suggestive of each etiology?
What points in physical examination relevant to each possible etiology?
What are the appropriate investigations helpful in reaching a diagnosis?

2) 10 years old girl presented with history of fever, pallor, cervical and axillary lymphadenopathy for the past 8 weeks.

What are the likely etiologies? (mention at least 3)
What points in history will be suggestive of each etiology?
What points in physical examination relevant to each possible etiology?
What are the appropriate investigations helpful in reaching a diagnosis?
Again always go by the most common
1.Infection (chronic like brucellosis) 2. Autoimmune 3.Malignancy

This is from males' group:
https://drive.google.com/file/d/1L2MdQITwYrZDPYviVDIE0o-f0df8dFNg/view?usp=drivesdk



PedsCases!

CERVICAL LYMPHADENOPATHY

HISTORY

- **HPI** (lymph node): onset, duration, size, pain, erythema, progression, rate of change, laterality
- **Exposures**: travel, animals/insects, food (unpasteurized dairy, undercooked meat), sick contacts
- **Immunizations** (eg. MMR)
- **IV drug use** and **STIs**

Associated symptoms:

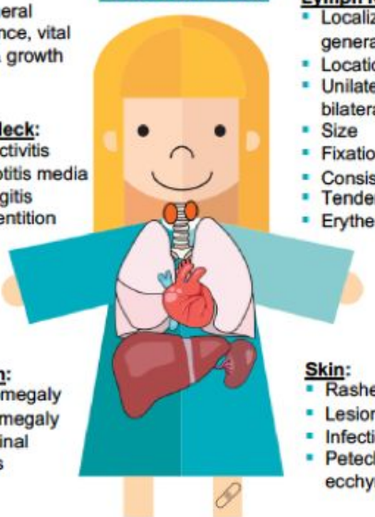
- **Infectious**: pharyngitis, conjunctivitis, rhinorrhea, cough, otalgia, rash, headache, fatigue, myalgia, fevers, chills
- **Autoimmune/inflammatory or rheumatologic**: fatigue, joint pain & swelling, rash, oral ulcers, prolonged or periodic fever, features of Kawasaki disease
- **Malignancy**: weight loss, night sweats, fatigue, pallor, bruising, fever, limp, bone pain

PHYSICAL EXAM

General appearance, vital signs, & growth

Head & Neck:

- Conjunctivitis
- Acute otitis media
- Pharyngitis
- Poor dentition



Lymph Node(s):

- Localized vs. generalized
- Location
- Unilateral vs. bilateral
- Size
- Fixation
- Consistency
- Tenderness
- Erythema

Abdomen:

- Hepatomegaly
- Splenomegaly
- Abdominal masses

Skin:

- Rashes
- Lesions
- Infection
- Petechiae, ecchymoses

RED FLAGS

Rule out **malignancy** and **chronic infections**.

- Infectious exposures
- Constitutional symptoms
- Generalized adenopathy without evidence of a viral infection
- Progressive painless node enlargement
- Supraclavicular node
- Enlarged node that does not regress/resolve in 4-6 weeks
- Signs of pancytopenia: pallor, bruising, bleeding
- Airway obstruction

CERVICAL LYMPHADENOPATHY

ACUTE (< 7 days)

Non-tender, small (< 2 cm), no red flags

REACTIVE LYMPHADENOPATHY

Transient response to URTI, skin infections, dental infections, etc. It is the most common cause of lymphadenopathy.

LYMPHADENITIS (tender, warm) ± fever ± erythema

BILATERAL

DDx:

- **Viral:** *EBV, CMV, rhinovirus, adenovirus, enteroviruses, herpes simplex,* measles, mumps, rubella
- **Bacterial:** strep pharyngitis
- **Other:** sarcoidosis, Kikuchi-Fujimoto disease

UNILATERAL

DDx:

- **Bacterial lymphadenitis:** *Group A strep (GAS), Staph aureus,* anaerobes, etc.
- **Viral:** *EBV, CMV, HIV, HSV, enteroviruses*
- **Other:** Kawasaki disease, *Syphilis*, etc.

SUB-ACUTE / CHRONIC (> 1-3 weeks)

DDx:

- **Viral:** *EBV, CMV, HIV, HSV, enteroviruses*
- **Bacterial:** *M. tuberculosis, atypical mycobacterium,* cat scratch disease (*Bartonella*)
- **Malignancy:** lymphoma, acute leukemia, etc.
- **Other:** Kawasaki disease, *toxoplasmosis*, etc.

INVESTIGATIONS

Not all children require investigations.

- **Basics**: CBC & differential, CRP
- **Infectious**: throat culture, serology as indicated (*EBV, CMV, Bartonella*, etc.), TB skin test, blood culture if child is toxic
- **Imaging**: U/S, chest x-ray (for mediastinal mass)
- **Malignancy**: peripheral blood smear, alkaline phosphatase, tumour lysis markers (LDH, urate, PO_4, Ca, K), biopsy

MANAGEMENT

Guided by diagnosis *(not an inclusive list)*

- **Reactive**: observe, re-evaluate in 2-4 weeks
- **Bacterial lymphadenitis**: antibiotics with *Staph aureus* and *Strep pyogenes* coverage
- **Viral**: supportive care
- **Malignancy**: oncology consult
- **Inflammatory**: rheumatology consult, IVIG for Kawasaki disease

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