Oral Medicine

Lecture 3

The Examination of the patient
Extra Oral (head and neck examination)
Lymph Nodes Examination

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History

The differential diagnosis of acute lymphadenopathy is broad. A patient's medical history and review of systems is important in narrowing this differential.

Upon examination, recognizing the pattern of lymph drainage aids in seeking an infectious focus.



Examination of L.N

Location: Determining whether LAP is localized or generalized makes the differential range narrower.

LAP in the supraclavicular area has the highest risk of malignancy; this risk is 90% in patients more than 40 years old and 25% in those under 40 years old. The Virchow node, in the left supraclavicular area, suggests intra-abdominal malignancies (e.g., gastric carcinoma), while in the right side suggests intra-thoracic malignancies.

Supraclavicular L.N





The location of the lymph node may help to determine the site of malignancy.

- Diffuse, bilateral involvement suggests a systemic malignancy (e.g. lymphoma)
- Limited to a specific anatomic region are more likely associated with a local problem.
- Enlargement of nodes located only on the right side of the neck in the anterior cervical chain, for example, would be consistent with a squamous cell carcinoma, frequently associated with an intra-oral primary cancer.
- Diffuse upper airway infections (e.g. mononucleosis), systemic infections (e.g. tuberculosis) and inflammatory processes (e.g. sarcoidosis) can all cause lymphadenopathy (i.e. lymph node enlargement).
- HIV infection can also cause adenopathy in any region of the body, including head/neck, axilla, epitrochlear, inguinal and other areas where there are lymph nodes. In these settings, the findings can be symmetric or asymmetric.



Cervical Adenopathy:

Massive right side cervical adenopathy secondary to metastatic squamous cell cancer originating from this patient's oropharynx

Cervical Adenopathy:

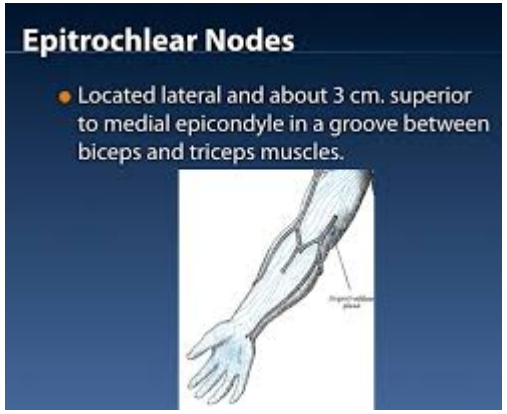
Right anterior cervical adenopathy secondary to metastatic cancer

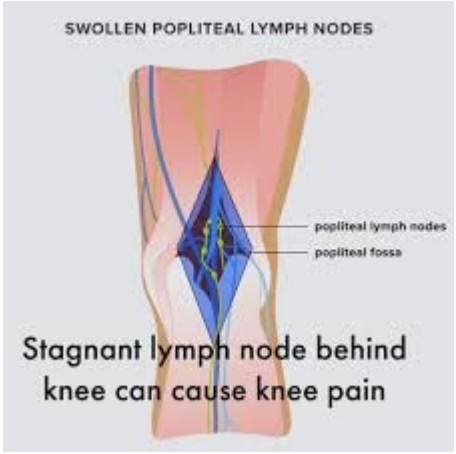


Size

It is suggested that palpable supraclavicular, iliac and popliteal nodes, epitrochlear greater than 0.5cm, and inguinal nodes larger than 1.5 cm are abnormal.

The nodes in other areas are considered as abnormal if their diameter exceeds one cm. However, there is no uniform nodal size at which the greater diameter can raise suspicion of a neoplastic etiology.





Pain and Tenderness

Pain and tenderness on a lymph node is a non-specific finding.

It is typically due to infection.

In some cases, pain is induced by hemorrhage into the necrotic center of a neoplastic node, immunologic stimulation of pain receptors, or rapid tumor expansion.

Consistency

Acute inflammation by infiltrating the node may make it more consistent, with concomitant tenderness due to the tension on the capsule.

- Chronic inflammation also leads to fibrotic changes, making the node hard in palpation.
- Stony-hard and painless nodes are usually signs of metastatic cancer or granulomatous disease.
- Firm and rubbery nodes can imply lymphoma.
- Matted lymph nodes are described when a group of nodes are conglomerated. They can be either due to benign (mycobacterial infection and sarcoidosis) or malignant (lymphoma and metastatic carcinoma) disorders.

Mobility

LAPs resulting from infections and collagen vascular diseases are usually freely movable in the subcutaneous region.

- Rubbery mobile nodes are associated with lymphoma.
- Nodes that are associated with malignancy are often fixed to the skin or surrounding tissues

The lymph node examination

Infrequently, patients will note enlarged lymph nodes and **present with the chief complaint of having a** nodule, a swollen gland, a "knot," or enlarged lymph nodes; more commonly, patients do not recognize that they have significantly enlarged lymph nodes, and the lymphadenopathy is discovered by the physician.

Since lymphadenopathy can be associated with a wide range of disorders spanning relatively benign medical problems such as **streptococcal pharyngitis** to life-threatening diseases such as **malignancies**, the discovery of enlarged nodes represents an important physical finding that demands a systematic evaluation.

The lymph node examination

- In searching for lymph nodes, one must be gentle; otherwise, lymph nodes that are only minimally enlarged or embedded in tissue may not be apparent.
- As mentioned earlier Particular attention should be directed to the **size**, **shape**, and **consistency** of enlarged nodes.
- Lymph nodes that are smooth and relatively soft, but slightly enlarged, may be normal and reveal only hyperplasia when biopsied.
- Enlarged lymph nodes that have an irregular shape and a rubbery, hard consistency may be infiltrated by malignant cells.
- Tender nodes are suggestive of an inflammatory process.
- Matted nodes or nodes fixed to underlying structures should raise the question of malignancy or infection; freely movable nodes are more likely to occur in benign conditions.

The lymph node examination

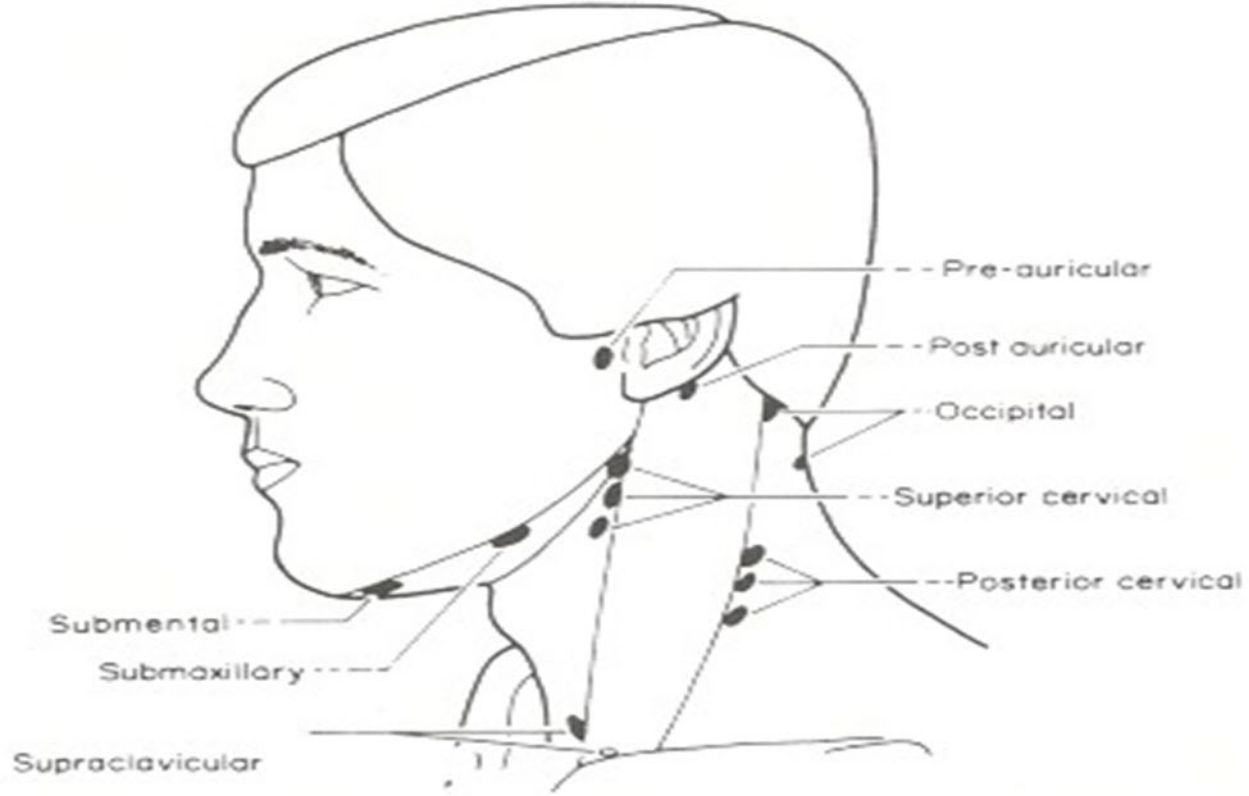
- ✓ Soft(insignificant),
- ✓rubbery (classically lymphoma),
- ✓hard (classically malignancy & granulomatous infection).
- ✓Tender (classically infection) vs. non-tender (classically malignancy) for example :

Lymph nodes are part of the immune system. As such, they are most readily palpable when fighting infections. Infections can either originate from the organs that they drain or primarily within the lymph node itself, referred to as lymphadenitis.

Facts related to Lymph Node Examination

1. Always evaluate for symmetry: clinically significant nodes classically asymmetric.
2. Identify salivary glands by location as non-lymph nodes.
3. Identify carotid artery/bulb by pulsation as non-lymph nodes.
4. Supraclavicular fossa most significant area: often indicates a process deep in body.
    a. Left supraclavicular node (Virchow's node) classical sign of abdominal process.
    b. Right superclavicular node classic sign of intrathoracic process.
5. **Trim fingernails!**
6. Infraclavicular fossa nodes: classically breast cancer or malignant lymphoma.
7. Epitrochlear lymph nodes: best felt when moving fingers up and down.

The major lymph node groups are located along the anterior and posterior aspects of the neck and on the underside of the jaw. If the nodes are quite big, the dentist may be able to see them bulging under the skin, particularly if the enlargement is asymmetric (i.e. it will be more obvious if one side is larger than the other).



To palpate, use the pads of all four fingertips (as these are the most sensitive parts of hands). Examine both sides of the head simultaneously, walking the fingers down the area in question while applying steady, gentle pressure.

The major groups of lymph nodes as well as the structures that they drain, will be discussed in this lecture. The description of drainage pathways are rough approximations as there is frequently a fair amount of variability and overlap.

Nodes are generally examined in the following order:

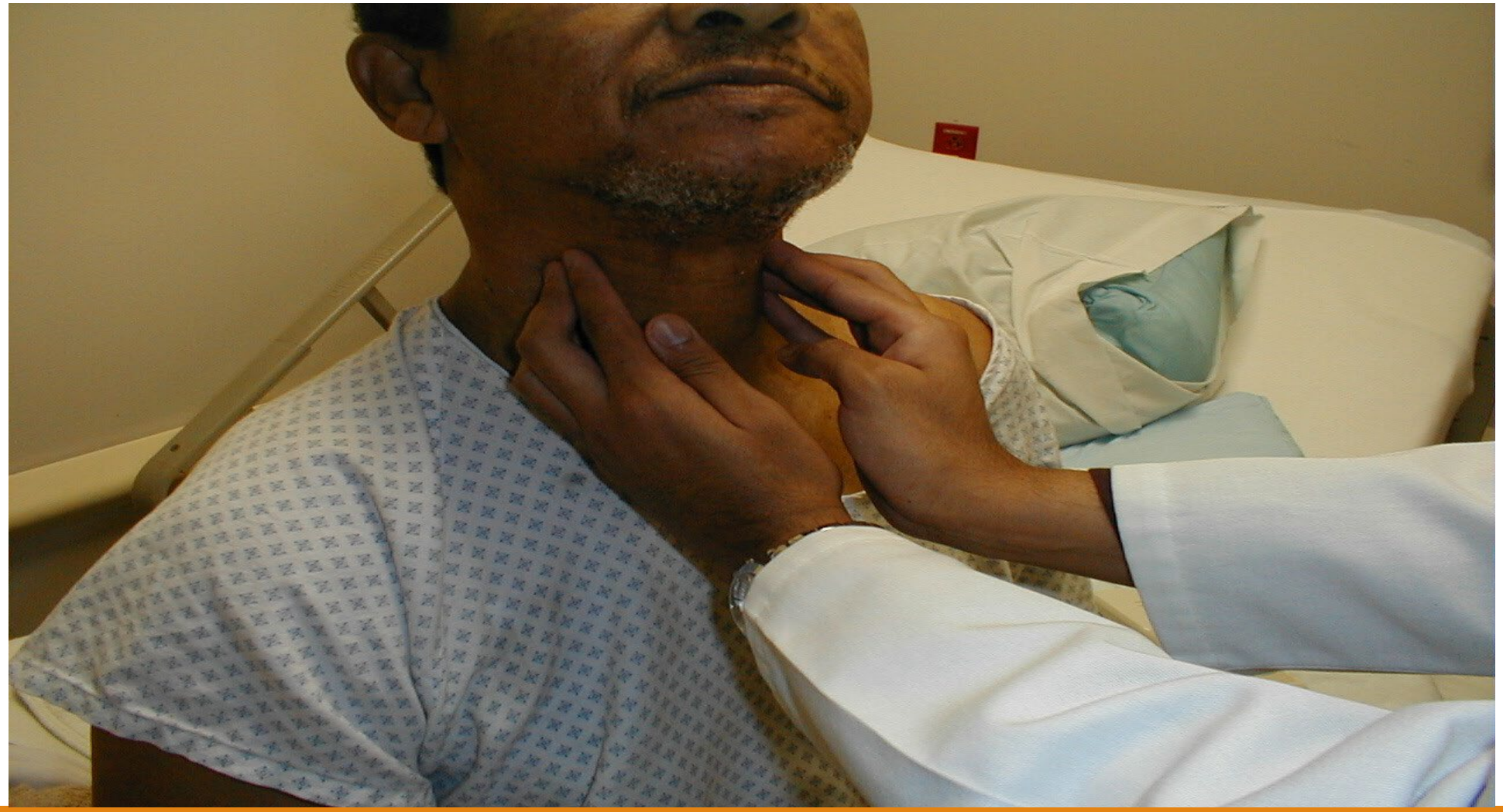
Anterior Cervical (both superficial and deep):

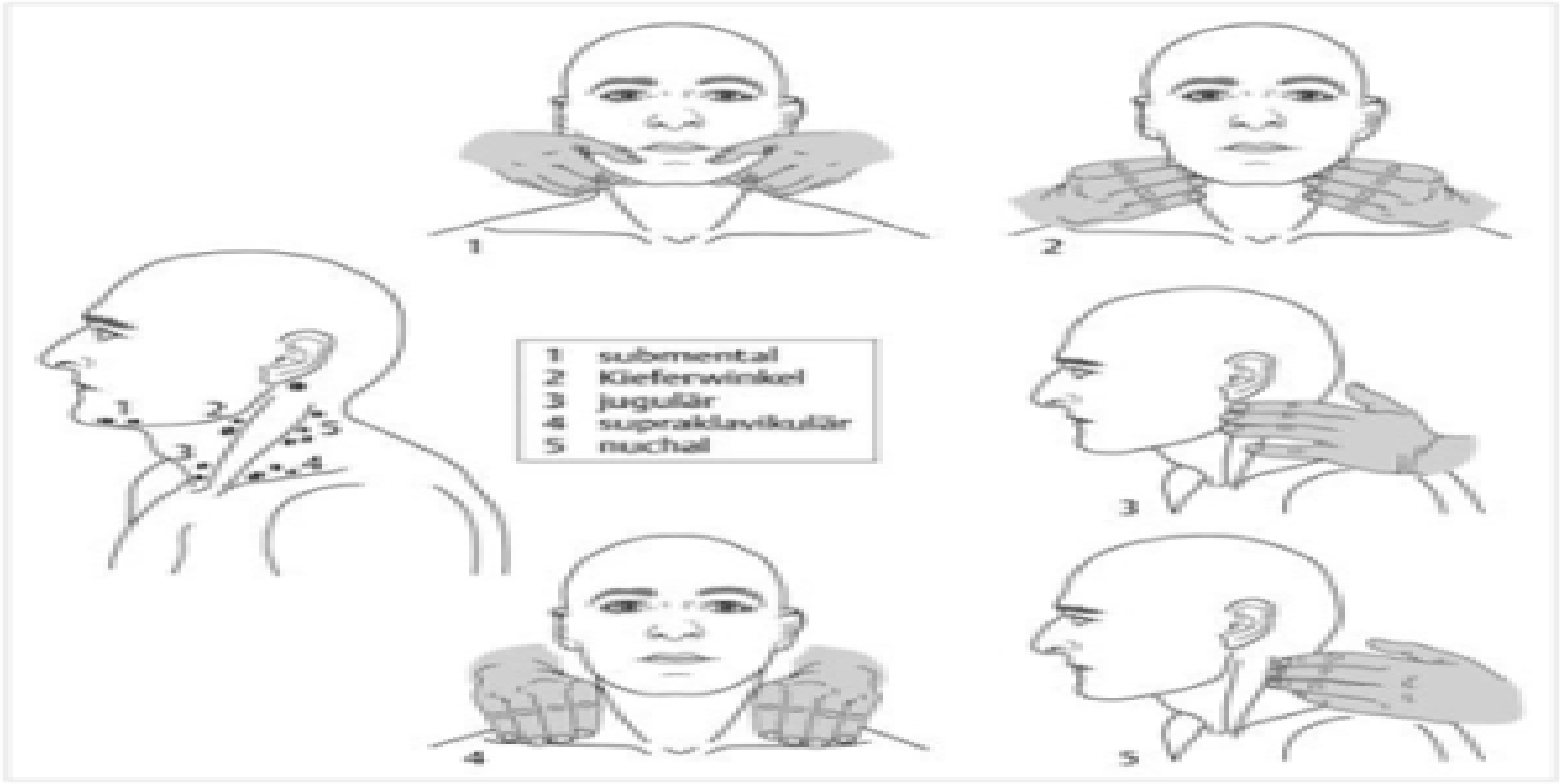
- Nodes that lie both on top of and beneath the sternocleidomastoid muscles (SCM) on either side of the neck, from the angle of the jaw to the top of the clavicle. This muscle allows the head to turn to the right and left.
- The right SCM turns the head to the left and vice versa.
- They can be easily identified by asking the patient to turn their head into the hand while provide resistance



- Drainage: The internal structures of the throat , part of the posterior pharynx, tonsils, and thyroid gland.

Anterior cervical lymph node

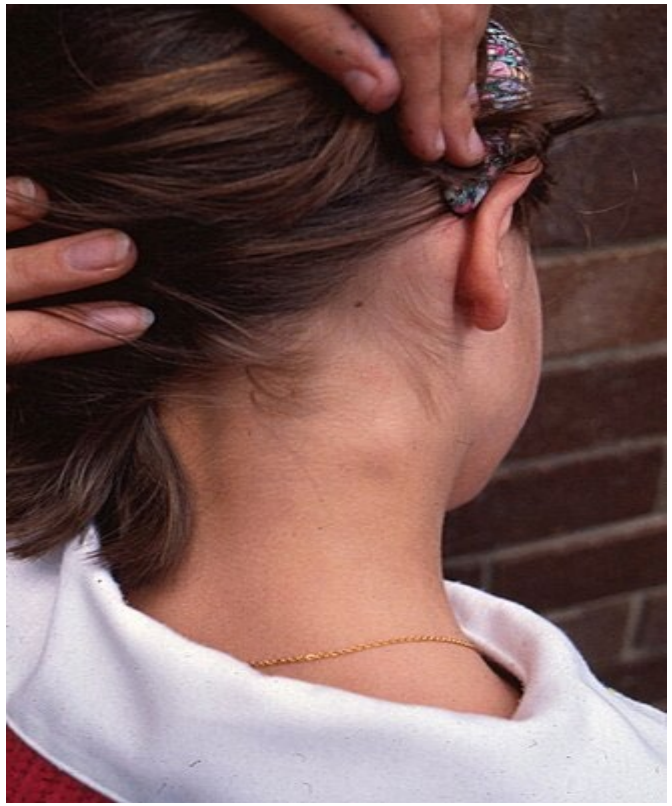



1 submental
2 Kieferwinkel
3 jugulär
4 supraklavikulär
5 nuchal
1
2
3
4
5

Posterior Cervical: Extend in a line posterior to the SCMs but in front of the trapezius, from the level of the mastoid bone to the clavicle.

- Drainage: The skin on the back of the head.

Also frequently enlarged during upper respiratory infections (e.g.mononucleosis).



Infectious mononucleoisis



Tonsillar: Located just below the angle of the mandible.

Drainage: The tonsillar and posterior pharyngeal regions.

Sub-Mandibular: Along the underside of the jaw on either side.

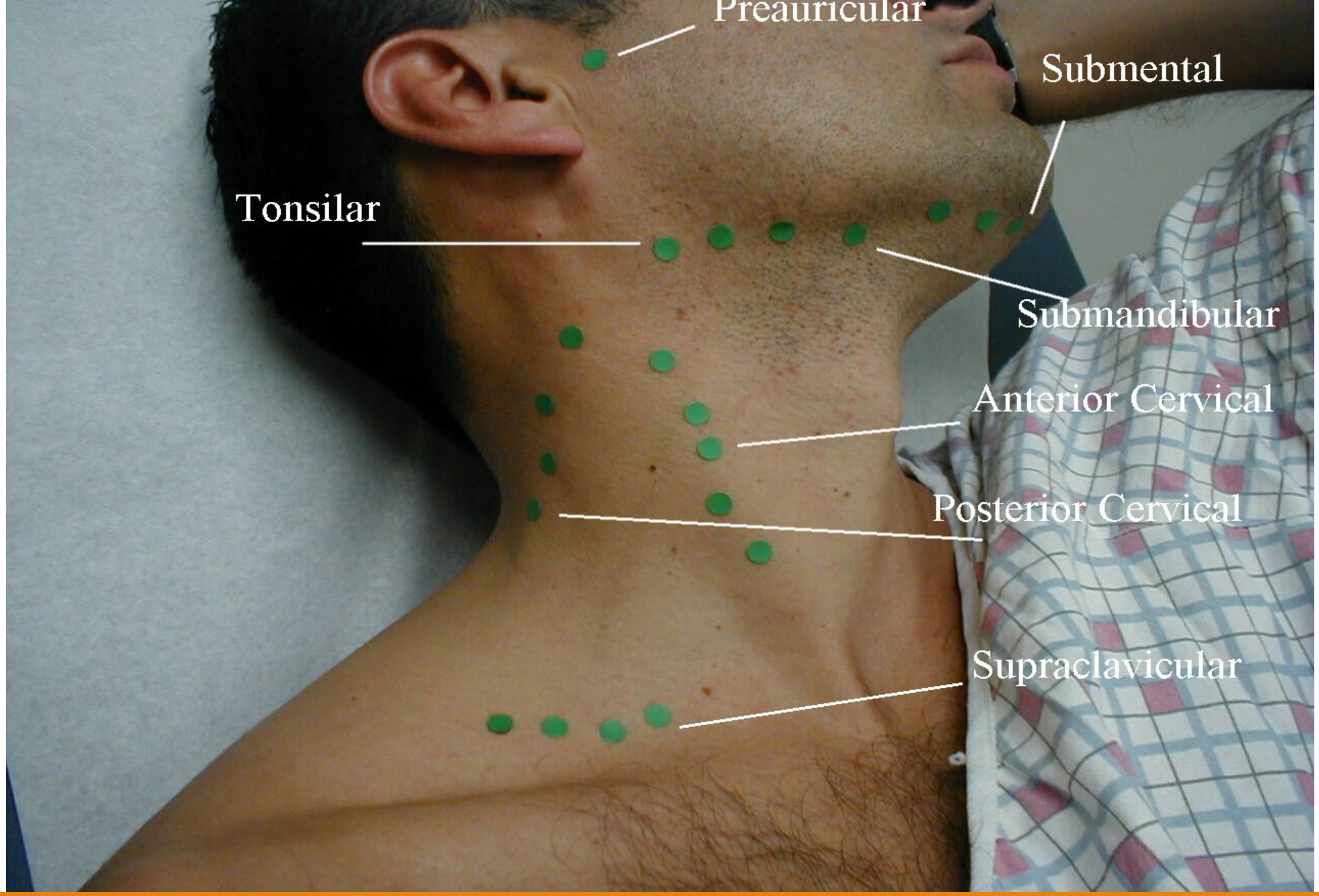
Drainage: The structures in the floor of the mouth.

Sub-Mental: Just below the chin.

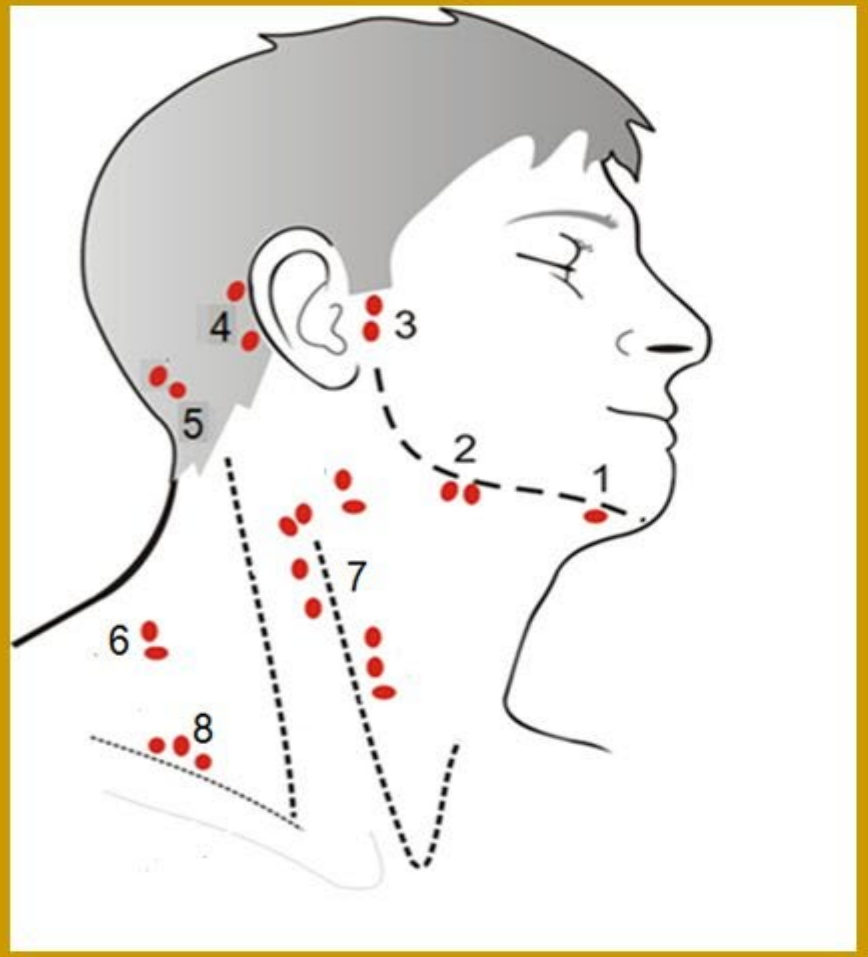
Drainage: The teeth and intra- oral cavity.

Supra-clavicular: In the hollow above the clavicle, just lateral to where it joins the sternum.

Drainage: Part of the thoracic cavity, abdomen.


Preauricular
Submental
Tonsilar
Submandibular
Anterior Cervical
Posterior Cervical
Supraclavicular

LYMPH NODE GROUPS OF HEAD AND NECK WE ROUTINELY EXAMINE



1. *Submental*
2. *Submandibular*
3. *Pre-auricular*
4. *Post-auricular*
5. *Occipital*
6. *Posterior triangle*
7. *Cervical chain – superficial & deep*
8. *Supraclavicular nodes*

Palpation of L.N



Submental L.N



Submandibular L.N



Supraclavicular L.N



Postauricular L.N



Posterior cervical L.N



Anterior cervical L.N



Periauricular L.N



Occipital L.N

- A number of other lymph node groups exist. However, palpation of these areas is limited to those situations when a problem is identified in that specific region (e.g. the pre-auricular nodes, located in front of the ears, may become inflamed during infections of the external canal of the ear)

- Lymph nodes are part of the immune system. As such, they are most readily palpable when fighting infections.
- **Infections** can either originate from the organs that they drain or primarily within the lymph node itself, referred to as lymphadenitis.
- Infected lymph nodes tend to be:

•Firm, tender, enlarged and warm.

•Inflammation can spread to the overlying skin, causing it to appear reddened.


Infected lymph node


Infected lymph
node draining pus

what happened during infection of the lymphnod ?

- The center of the node may become necrotic, resulting in the accumulation of fluid and debris within the structure.

This is known as an abscess and feels a bit like a tensely filled balloon or grape (Fluctuance)

Note :

Following infection, lymph nodes occasionally remain permanently enlarged, though they should be non-tender, small (less the 1 cm), have a rubbery consistency. Therefore, it is common, for example, to find small, palpable nodes in the submandibular/tonsillar region of healthy individuals.

This likely represents sequelae of past pharyngitis or dental infections.

Malignancies may also involve the lymph nodes,
primarily e.g. lymphoma or as a site of metastasis.

- In either case, these nodes are generally: Firm, non-tender, matted (i.e. stuck to each other), fixed (i.e. not freely mobile but rather stuck down to underlying tissue), and increase in size over time.

- Non –Hodgkin Lymphoma



How to start to deal with lymphnode enlargement?

Historical information as well findings else where in the body are critical to making these diagnoses.

Examinations (sonography ,CT, MRI) over the course of weeks to determine whether a node is truly enlarging, suggestive of malignancy, or might occur with other inflammatory processes."

Clinical examination of the L.N

The dentist need inspection and palpation technique:

use the pads of the index and middle finger(The "flat" of the fingers not the tip) to move the skin in circular motions over the underlying tissues in each area; palpate both sides of the neck simultaneously small nodes (< size of distal phalanx of pinky finger) are normal unless in unusual location (preauricular).

In abnormal nodes, the location ,size, delamination (discrete or matted together), mobile or fixed consistency (soft, hard, firm) tenderness

THE DENTIST SHOULD BE WELL KNOWN ABOUT THE location and drainage OF THE L.N

Location of Nodes (And what it drains)

- preauricular - in front of tragus of ear (eye)
- postauricular - behind ear, over mastoid process (ear)
- submental - inside mentus of the mandible (floor of mouth)
- submandibular - near submandibular salivary glands (oral cavity)
- retro-sternocleidomastoid
- posterior chain runs along the trapezius
- clavicular (abdomen, thorax, breast)
- supraclavicular - Virchow's node (ominous finding in cancer patient)

Differentiation from lymphomas

requires the use of clinical features, histology, immunophenotyping, and gene rearrangement studies for monoclonal population detection.

Common differential diagnoses to be considered are listed below:

Neoplasms

These include the following:

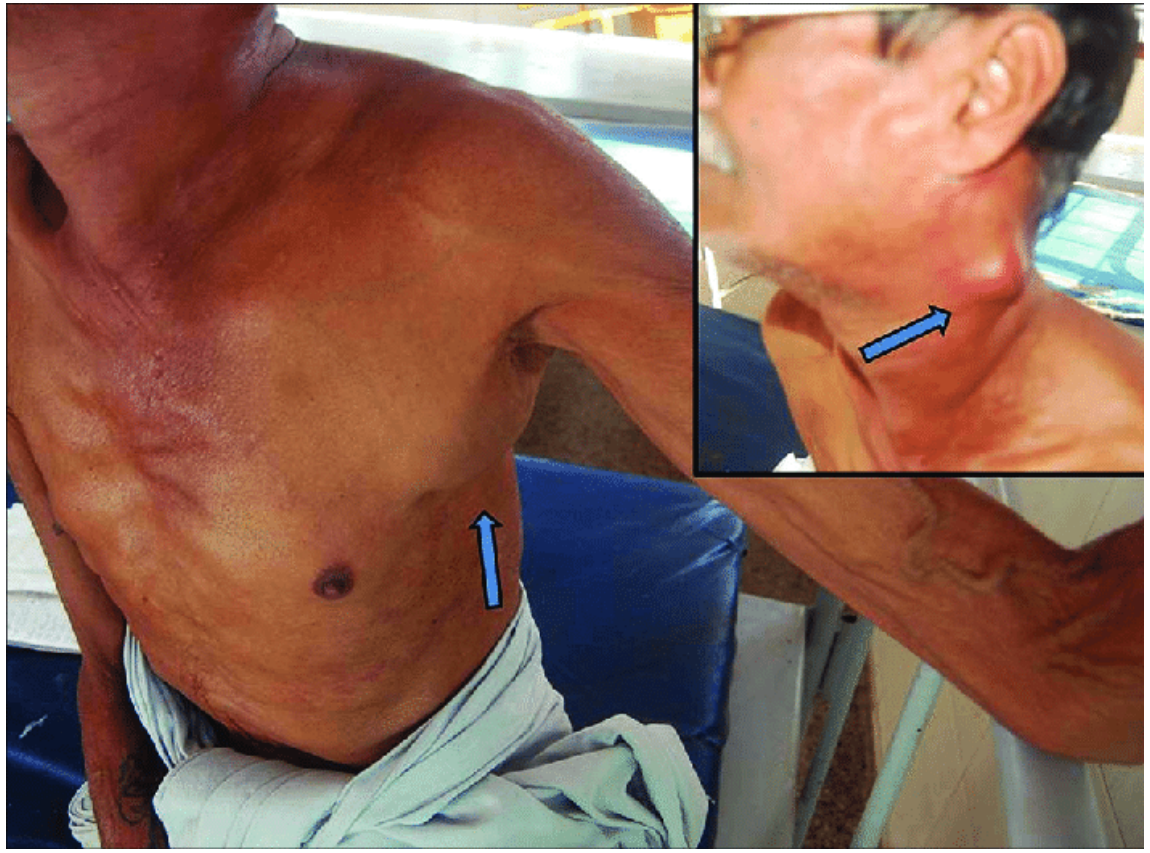
- Squamous cell carcinoma
- Nasopharyngeal carcinoma
- Thyroid carcinoma

Generalized lymphadenopathy

Is defined as enlargement of more than 2 noncontiguous lymph node groups. A thorough history and physical examination are critical in establishing a diagnosis. Causes of generalized lymphadenopathy include :

infections, autoimmune diseases, malignancies, histiocytoses, storage diseases, benign hyperplasia, and drug reactions.

Generalized lymphadenopathy



Generalized lymphadenopathy

- Bacteria

Viruses (eg, Epstein-Barr virus infectious mononucleosis, cytomegalovirus,

- HIV)
- Parasites (eg, toxoplasmosis)

Nasal granulomatous disease

- Wegener granulomatosis
- Lymphomatoid granulomatosis
- Infections (eg, leishmaniasis, syphilis)

Infection

Viral Infections:

- Infectious mononucleosis
- Roseola infantum (caused by human herpes virus 6),
- cytomegalovirus (CMV)
- varicella, and adenovirus
- Human immunodeficiency virus (HIV) is often associated with generalized adenopathy, mostly (Children with HIV are at increased risk for tuberculosis,)

Bacterial

Although usually associated with localized node enlargement, some bacterial infections present with generalized adenopathy.

Examples include:

typhoid fever caused by Salmonella typhi, syphilis, plague, and tuberculosis.

Less common bacteremia's, including those caused by endocarditis, result in generalized lymphadenopathies

Malignant etiologies

Malignancy is often associated with constitutional signs, such as fever, anorexia, nonspecific aches and pains, weight loss, and night sweats. The acute leukemias and lymphomas often present with these nonspecific findings.

Generalized lymphadenopathy is present at diagnosis in two thirds of children with acute lymphoblastic leukemia (ALL) and in one third of children with acute myeloblastic leukemia (AML). Abnormalities of peripheral blood counts usually lead to the correct diagnosis. The lymphomas more often present with regional lymphadenopathy, but generalized lymphadenopathy occurs.

Constitutional signs and symptoms observed in the leukemias are less reliable findings in the lymphomas. Only one third of children with Hodgkin disease and 10% with non-Hodgkin lymphoma display them.

Malignancies usually present with nodes that tend to be firmer and less mobile or matted; however, this finding can be misleading.

While Benign reactive lymph nodes may be associated with fibrotic reactions that make them firm.

Generalized lymphadenopathy
Storage diseases:

is an important manifestation of the lipid storage diseases. In Niemann-Pick disease, sphingomyelin and other lipids accumulate in the spleen, liver, lymph nodes, and CNS.

In Gaucher disease, the accumulation of the glucosylceramide leads to the engorgement of the spleen, lymph nodes, and the bone marrow .

Drug reactions

Adverse drug reactions can cause generalized lymphadenopathy. Within a couple of weeks of initiating phenytoin, some patients experience a syndrome of regional or generalized lymph node enlargement, followed by a severe maculopapular rash, fever, hepatosplenomegaly, jaundice, and anemia.

- These symptoms abate 2-3 months after discontinuation of the drug.
- Several other drugs are implicated in similar symptomatology, including mephenytoin, pyrimethamine, phenylbutazone, allopurinol, and isoniazid.

Autoimmune etiologies

include juvenile rheumatoid arthritis, which often presents with adenopathy, especially during the acute phases of the disease.

Sarcoidosis and graft versus host disease also merit consideration.

Other nonneoplastic etiologies

Rare nonneoplastic causes of generalized lymphadenopathy include Langerhans cell histiocytosis and Epstein-Barr virus (EBV)-associated lymphoproliferative disease.

Generalized Acute Cervical Lymphadenopathy Causes

Common Causes

- Tinea Capitis

Infectious Mononucleosis (Epstein Barr Virus)

- Cytomegalovirus Adenovirus

Less common causes

- Secondary Syphilis

Lice infestation

- Serum Sickness
- Severe drug allergy (e.g. Penicillin)
- Cat Scratch Disease
- Rubella
- Generalized Furunculosis

Cervical lymphadenopathy

is a common problem in children. Cervical nodes drain the tongue, external ear, parotid gland, and deeper structures of the neck, including the larynx, thyroid, and trachea.

Inflammation or direct infection of these areas causes subsequent engorgement and hyperplasia of their respective node groups.

- Adenopathy is most common in cervical nodes in children and is usually related to infectious etiologies.
- Lymphadenopathy posterior to the sternocleidomastoid is typically a more ominous finding, with a higher risk of serious underlying disease.
- In patients with cervical adenopathy, determine whether: the patient has had recent or ongoing sore throat or ear pain. **The dentist should examine the oropharynx, paying special attention to the posterior pharynx and the dentition .**

1-Infectious etiologies

Cervical adenopathy is a common feature of many

Viral infections. Infectious mononucleosis often manifests with posterior and anterior cervical adenopathy. Firm tender nodes that are not warm or erythematous characterize this lymph node enlargement. Other viral causes of cervical lymphadenopathy include adenovirus, herpesvirus, coxsackievirus, and CMV. In herpes gingivostomatitis, impressive submandibular and submental adenopathy reflects the amount of oral involvement.

Bacterial infections

Bacterial infection often results in enlarged lymph nodes that are warm, erythematous, and tender. Localized cervical lymphadenitis typically begins as enlarged, tender, and then fluctuant nodes

1-Infectious etiologies

The classic manifestation of group A streptococcal pharyngitis is sore throat, fever, and anterior cervical lymphadenopathy. Other streptococcal infections causing cervical adenopathy include otitis media, impetigo, and cellulitis.

Mycobacterium tuberculosis may manifest with a suppurative lymph node identical to that of atypical mycobacterium. A biopsy may be necessary to establish the diagnosis.

Cat scratch disease, , presents with subacute lymphadenopathy often in the cervical region. The disease develops after the infected pet (usually a kitten) inoculates the host, usually through a scratch. Approximately 30 days later, fever, headache, and malaise develop, along with adenopathy that is often tender

2-Non infectious etiologies

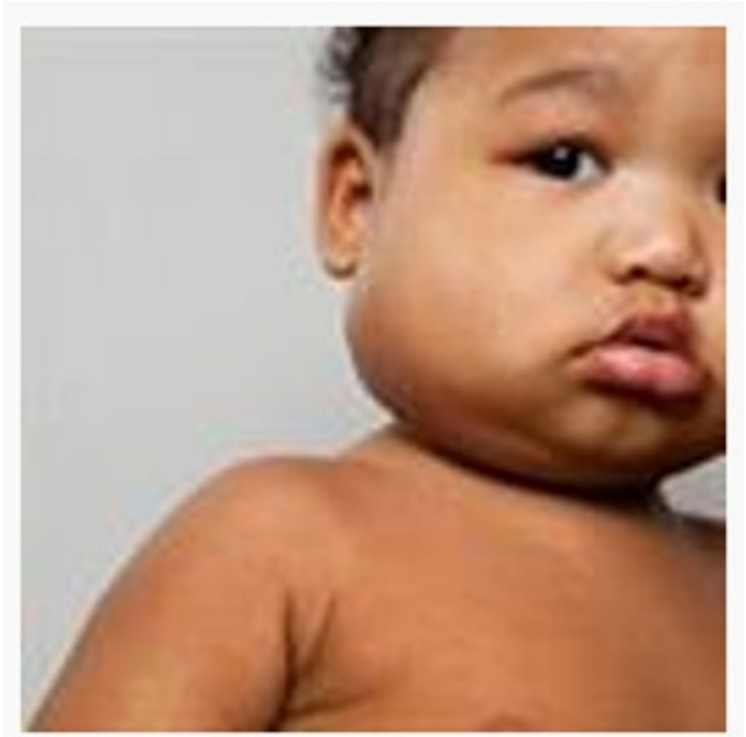
- Kawasaki disease is an important cause of cervical adenopathy.

These children have fever for at least 5 days, and cervical lymphadenopathy

Other Neck Masses

- Cystic Hygroma
- Sialadenitis (Submandibular Gland)
- Vascular malformations
- Squamous Cell Carcinoma of the head and neck
- Lymphoma
- Leukemia

Kawasaki disease



Other midline Neck Masses (into hyoid region)

- Thyroglossal Duct Cyst
- Dermoid cyst
- Cystic Hygroma
- Thyroid tumor

Examples of cervical node enlargement & drainage pattern

- **Posterior Cervical Nodes (behind sternocleidomastoid)**

• Drainage Pattern from
• Scalp
• Neck
• Arm and pectoral skin
• Thorax
• Cervical and axillary node drainage
• Lymphadenopathy Causes :
- Tuberculosis
-Lymphoma (especially Hodgkin's Lymphoma)
-Head and neck cancer

Examples of cervical node enlargement & drainage pattern

- **Preauricular nodes (anterior to ear tragus)**

Drainage Pattern from

- Lateral Eyelids
- Palpebral Conjunctiva
- Temporal skin
- Anterior Ear Pinna
- External auditory canal

-Ophthalmic Herpes Zoster
-Rubella
-Trachoma
- Atypical Mycobacterial Infection
- Cat Scratch Disease

- Lymphadenopathy Causes: Non-ocular
- Squamous Cell Carcinoma or Basal Cell Carcinoma (Rodent ulcer)

Chancre on face

Erysipelas

Examples of cervical node enlargement & drainage pattern

● Supraclavicular Nodes

Drainage pattern

-Right supraclavicular node

• Mid-chest

• Esophagus

• Lungs

- Left supraclavicular node

Virchow's Node

Thoracic duct drainage (Chest, Abdomen)

• Lymphadenopathy Causes
• Malignancy (represents 90% of cases age>40 years old)
• Lymphoma
• Mediastinal disease
• Tuberculosis
• Histoplasmosis and other Fungal Lung Infections
• Sarcoidosis

Examples of cervical node enlargement & drainage pattern

Submandibular Nodes (below angle of jaw)

- Tinea Capitis
- Pharyngitis (Mononucleosis, Upper Respiratory Infection)
- Atypical Mycobacterial Infection
- Cat-Scratch Disease
- Rubella
- Dental Infections

Drainage Pattern

- Tongue
- Submaxillary gland
- Submental node drainage
- Lip and Mouth mucosa
- Medial Conjunctiva

Examples of cervical node enlargement & drainage pattern

Submental Nodes (below chin)

Drainage Pattern from

- Lower lip
- Floor of Mouth

Tip of Tongue

- Skin of Cheek

- Lymphadenopathy Causes
  - Mononucleosis (Epstein-Barr Virus)
  - Cytomegalovirus
  - Toxoplasmosis
  - Thyroglossal Duct Cyst



Fig. 1.1A: Palpation of the submandibular lymph nodes



Fig. 1.1B: Palpation of the submental lymph nodes



Fig. 1.1D: Palpation of the middle jugular lymph nodes



Fig. 1.1E: Palpation of the lower jugular lymph nodes

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Table 1

Differential Diagnosis of Peripheral Lymphadenopathy

Localized Peripheral Lymphadenopathy	
Cervical	*Infections:*
	Viral: Upper respiratory tract infections, mononucleosis, herpes virus, coxsackie cytomegalovirus, HIV
	Bacterial: Staphylococcus aureus, Streptococcus pyogenes (group A), mycobacterium, dental abscess, cat scratch disease
	Malignancy: Hodgkin's disease, non-Hodgkin's lymphoma , thyroid cancer, squamous cell carcinoma of the head and neck
Supraclavicular	*Malignancy*: Abdominal/thoracic neoplasm, thyroid cancer, Hodgkin's disease, non-Hodgkin's lymphoma, breast carcinoma
	Infections: Mycobacterial, fungal
Axillary	*Infections*: Staphylococcal and Streptococcal skin infections, cat scratch disease, sarcoidosis
	Malignancy: Breast cancer, lymphomas, luekemias
Inguinal	*Benign Reactive Lymphadenopathy*
	Infections: Sexually transmitted disease, cellulitis
	Malignancy: Lymphomas, squamous cell carcinoma of the penis and vulva, metastatic melanoma
Generalized Peripheral Lymphadenopathy	
Infections	Mononucleosis, HIV, miliary tuberculosis, typhoid fever, syphilis, plague
Malignancy	Lymphomas, acute leukemias
Autoimmune Disorders	Systemic lupus erythematosus, rheumatoid arthritis, Sjögren’s syndrome, sarcoidosis
Drug Reactions	Phenytoin, Allopurinol, Atenolol
Lipid Storage Diseases	Gusher's disease, Neiman-Peak

THANK YOU