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An Algorithm Approach to Pediatric Diagnosis

Lymphadenopathy

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Introduction

- Lymphadenopathy (or “swollen glands”) is a common entity found in children; the cause is reactive in most cases.
- The presence of this can be due to various causes such as infection, inflammation, or an underlying hematological malignancy, and thus detailed history and examination are crucial for the approach.

Definitions

- *Lymphadenitis*: A lymph node that is enlarged due to an infective or inflammatory etiology that may be warm and tender to touch and erythematous. Systemic signs may or may not be present.
- *Lymphadenopathy*: Enlarged lymph node(s), which is >2 cm and has an increased chance of being caused by serious underlying conditions.

Lymphadenopathy is a condition when lymph nodes are abnormal in size, shape, and consistency.

If the size of the palpable lymph nodes is >1.5 cm in the inguinal region and >1 cm anywhere else, it is considered to be significant.

However, when cervical lymph nodes that are palpable are >2 cm in size, it is unlikely to be a serious condition.

Based on the involvement of lymph nodes, lymphadenopathy can be classified into the following two types:

1. *Localized lymphadenopathy*: Nodes that are enlarged and confined to one particular region
2. *Generalized lymphadenopathy*: Nodes that are enlarged and found in two or more noncontiguous areas

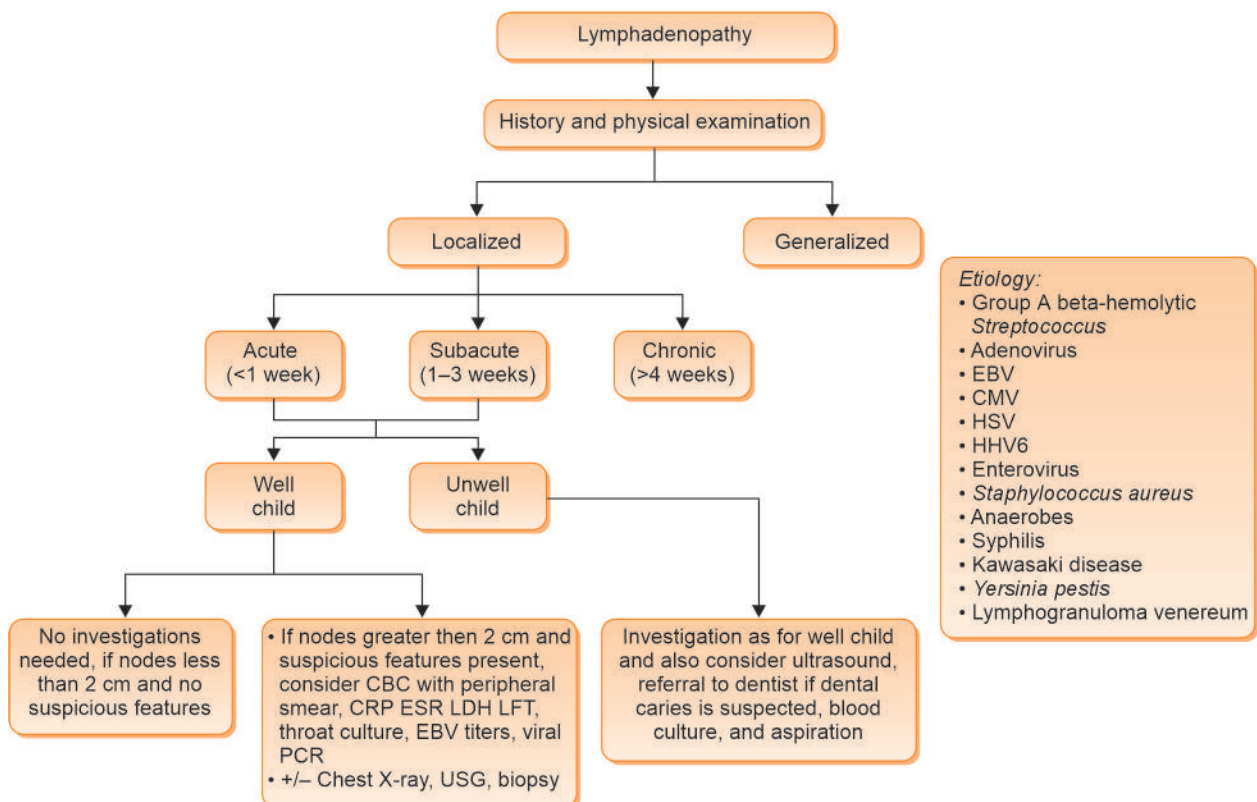
Lymphadenopathy can be classified into the following types on the basis of the duration it lasts for:

- Acute lymphadenopathy: <1 week
- Subacute lymphadenopathy: 1–3 weeks
- Chronic lymphadenopathy: >4 weeks

Approach

The etiology and approach to diagnosing lymphadenopathy are given in **Flowchart 1**.

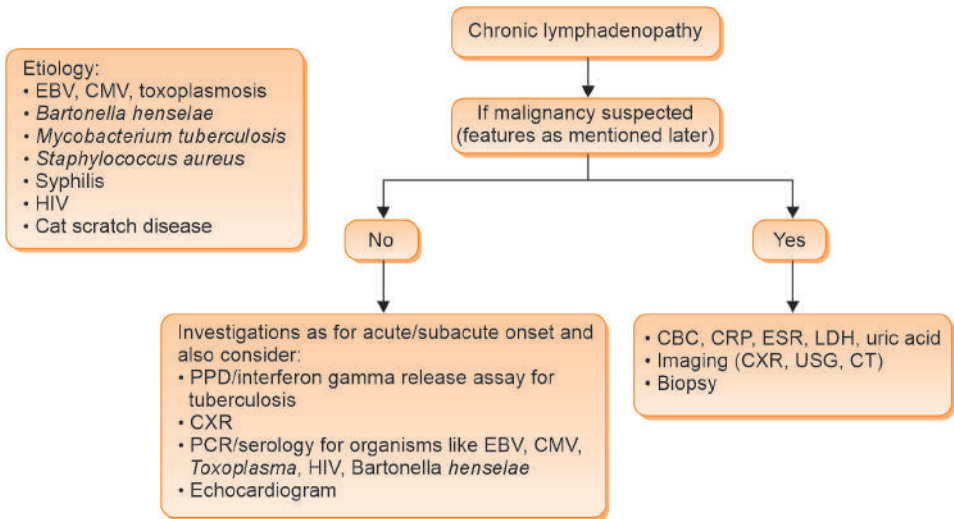
FLOWCHART 1: Etiology and approach to lymphadenopathy.



(CBC: complete blood count; CMV: cytomegalovirus; CRP: c-reactive protein; EBV: Epstein–Barr virus; ESR: erythrocyte sedimentation rate; HSV: herpes simplex virus; HHV6: human herpesvirus 6; LDH: lactate dehydrogenase; LFT: liver function tests; PCR: polymerase chain reaction; USG: ultrasonography)

The etiology and approach to diagnosing chronic lymphadenopathy are given in **Flowchart 2**.

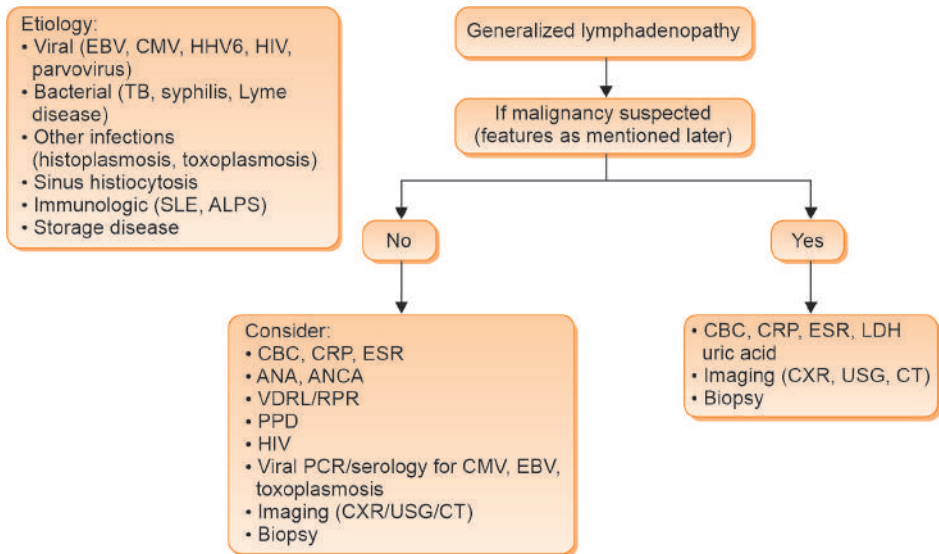
FLOWCHART 2: Approach to chronic lymphadenopathy.



(CT: computed tomography; CBC: complete blood count; CMV: cytomegalovirus; CRP: c-reactive protein; CXR: chest X-ray; EBV: Epstein–Barr virus; ESR: erythrocyte sedimentation rate; HIV: human immunodeficiency virus; LDH: lactate dehydrogenase; PCR: polymerase chain reaction; PPD: purified protein derivative; USG: ultrasonography)

The etiology and approach to diagnosing generalized lymphadenopathy are given in **Flowchart 3**.

FLOWCHART 3: Approach to generalized lymphadenopathy.



(ALPS: autoimmune lymphoproliferative syndrome; ANA: antinuclear antibody; ANCA: antineutrophil cytoplasmic antibodies; CT: computed tomography; CBC: complete blood count; CMV: cytomegalovirus; CRP: c-reactive protein; CXR: chest X-ray; EBV: Epstein–Barr virus; ESR: erythrocyte sedimentation rate; HIV: human immunodeficiency virus; LDH: lactate dehydrogenase; PCR: polymerase chain reaction; PPD: purified protein derivative; RPR: rapid plasma reagin; SLE: systemic lupus erythematosus; USG: ultrasonography; VDRL: venereal disease research laboratory)

Red Flag Signs

The following are considered “red flags” for significant pathology and would warrant urgent referral:

- Severe pallor
- Loss of weight
- Loss of appetite
- Fatigue
- Fever or any signs of sepsis
- Bleeding or bruising, which is unexplained
- Symptoms such as shortness of breath or discomfort lying down, unexplained fever or night sweats, unexplained weight loss, and chest pain suggestive of a mediastinal mass

Investigations

Most children with just a single node palpable need not be evaluated for the same.

The indications for detailed evaluation include:

- Cervical lymph nodes that are palpable over 2 weeks and are >2 cm in size and progressing
- Unexplained inguinal lymphadenopathy >1.5 cm in diameter
- Axillary, epitrochlear, and supraclavicular lymph nodes which are enlarged >1.5 cm and are not due to any obvious underlying cause
- Symptoms of the red flags mentioned earlier

When to Suspect Malignancy?

A single lymph node >2 cm in diameter with any of the following additional features may prompt a detailed evaluation:

- Absence of definite infectious cause
- Node significantly enlarged >2 cm, present for over 6 weeks or more, not reducing in size
- Extensive distribution
- Firm/hard consistency and immobile on palpation
- Not tender

Clinical criteria for referral regardless of the size of the palpable lymph nodes:

- Supraclavicular nodes
- Splenomegaly, loss of weight, and night sweats
- Associated bone pain and limping
- Chest X-ray showing mediastinal widening

Suggested Reading

- Maini R, Nagalli S. Lymphadenopathy. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024. Available from <https://www.ncbi.nlm.nih.gov/books/NBK558918/> [Last accessed August, 2024].
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- Rosenberg TL, Nolder AR. Pediatric cervical lymphadenopathy. *Otolaryngol Clin North Am*. 2014;47(5):721-31.
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