Clinical Guideline

NECK MASS

SETTING	Primary and Secondary Healthcare Institutions in the Western Cape which refer to Red Cross War Memorial Children's Hospital (RCWMCH)
FOR STAFF	Primary and Secondary Doctors and Nurses who refer patients to RCWMCH
PATIENTS	Patients under the age of 13 years old with a neck mass

Introduction

Neck masses are common in the paediatric population. Lymphadenitis is the most common cause. Lymphadenopathy secondary upper respiratory infections or local skin infections, or less commonly from lymphoma are frequently seen. Congenital developmental masses occur more rarely.

This guideline will assist doctors and nurses to categorise neck masses according to the likely cause before starting initial management or planning an appropriate referral.

Background

Lymph glands at the front of the neck can get larger (reactive lymphadenitis) during an infection of the oral cavity, throat or upper respiratory tract because they drain this area. Most of these infections are viral and self-limiting. Less commonly, a wide variety of bacterial infections can occur. Lymph glands in the posterior neck triangle drain the scalp and neck skin, and infections in these glands are usually from skin bacteria like Staphylococcus. If a bacterial infection stimulates the immune response to create pus (suppuration) an abscess can develop.

Lymphadenopathy secondary to a malignant cause in children is most likely to be due to lymphoma. Biopsy is needed in patients with no clear infective cause for this who have lymphadenopathy that is present for more than 4 – 6 weeks.

Masses in the neck may be due to tissue left behind during the development of the neck structures. Knowing a little about this process can help to improve your understanding about why this happens.

<u>Thyroid embryology:</u>

During the early development of the foetus, a small indentation in the base of the tongue grows down into the area of the neck. This indentation is called the foramen cecum and if you look carefully at your own tongue you will be able to see this small dimple in the centre of your tongue at the level where the surface texture changes about 2 third of the way back.

As this structure tracks down into the neck where the thyroid will end up developing, there is a small duct that connects the back of the tongue to the front of the lower neck called the thyroglossal duct. Normally this duct completely closes. but if it does not, a cyst develops at the end of this duct. This cyst is called a thyroglossal duct cyst.

Thyroglossal duct cysts are usually found in the midline of the front of the neck and move up when the patient sticks their tongue out because of the connection to the base of the tongue.

Embryology of the pharyngeal arches:

During very early development of the foetus, the bone, cartilage, nerves and muscles and glands of the lower face and neck develop from multiple symmetrical folds of the embryo in this area called the pharyngeal arches. These arches have a contribution from the all the layers of the embryo (ectoderm, endoderm and mesoderm) and will develop into multiple different structures ranging from the tiny bones that are in the ear to part of the thymus in the chest.

Along this zone there are 6 arches that develop, and these are separated by pouches and clefts. Each arch develops into different structures and some grow over the surface of others. In the case of a pharyngeal arch remnant, it is often the case that a cyst develops because of the neck structures grow around each other. A cyst, sinus tract (small hole in the skin), or small piece of left-over cartilage can develop from these folds.

These remnants are called pharyngeal arch remnants and are usually noted along the anterior border the sternocleidomastoid muscle, on either one or both sides of the neck.

Important details on history

Duration: Has the mass been there from birth or has it developed over time?
Speed of development: a slow growing TB node versus a rapidly increasing bacterial lymphadenitis
Pain: Is the mass tender? – this implies fast growth from infection
Associated symptoms: Fever, night sweats, loss of weight, chronic cough, other nodes (these may indicate a more systemic process)

Important details on examination

General examination:
- Other sites of lymphadenopathy
- Weight loss or growth faltering
- Pallor

Associated conditions: Examine the whole region, including inside the mouth to exclude tonsillitis, a dental problem or scalp dermatitis – if any of these are present the mass may be a reactive node

The mass itself:
- Nature of the lesion: mass versus sinus versus a pit
- Site: Is the mass central, or lateral?
- Size
- Consistency: Firm to rubbery nodes indicate serious underlying conditions
- Mobility: small mobile nodes are common in children, fixed firm nodes require investigation.
- Tenderness: this suggests infective process
- Overlying redness or oedema suggest infective process

Thyroglossal cysts occur in the midline of the front of the neck and usually move up when the patient sticks out their tongue because of the duct connection to the base of the tongue.

Make a diagnosis

Position of the mass	Diagnosis	Clinical features

Midline	Thyroglossal cyst*	Midline mass that moves upwards on protrusion of the tongue. Large, uninfected ones can also sometime transilluminate because they are full of mucous
	Dermoid cyst	Midline mass, does not move on protrusion of the tongue.
	Pyramidal lobe of the thyroid	Non-cystic mass in the midline, closely associated with the thyroid.
	Submental lymph node	Mass in the midline of the floor of the mouth
Lateral	Pharyngeal remnants *	Cystic lesions, cartilage remnants or small duct opening along the anterior border of the sternocleidomastoid muscle; It may be bilateral.
	Lymphadenopathy	Can be in the anterior or posterior triangle of the neck. May be reactive, infective or neoplastic.
	Lymphadenitis	Bacterial infection of lymph nodes. These nodes can become very swollen and tender with redness of the overlying skin. It is common for an abscess to develop over time in the area as the process evolves.
	Lymphatic or vascular malformations	These are congenital. Most are cystic. Overlying skin changes (e.g. blue discolouration or small vesicle-like lymph blebs) are often seen. They may fluctuate in size in response to trauma, viral illnesses or valsalva manoeuvre.
Sublingual	Ranula	A mucous retention cyst related to a sublingual salivary gland. These are usually just off the midline and can look shiny when large and the mucosa is stretched out.
	Teratoma	A tumour of the floor of the mouth which often presents at birth or soon afterwards. These masses may be cystic or solid and can contain hair, of even nervous tissue.

*Secondary infection of thyroglossal cysts or pharyngeal remnants can result in an abscess forming along the classical anatomical lines that these lesions are found. It is important to avoid incision and drainage of these abscesses when they occur within a congenital cyst. This is because the scaring caused by incision and drainage will make the tissue planes difficult to follow when the definitive management of excision is done later.

Management and referral guidance

Diagnosis	Management and referral guidance
Thyroglossal cyst	It may be difficult to differentiate these lesions clinically in the primary care setting. Patients with a midline mass that is not inflamed should have a non-urgent referral for review at the paediatric surgical outpatients department.
Dermoid cyst	
Pyramidal lobe of the thyroid	

	Clinical review and further investigation will be arranged as necessary. Inflamed (tender, red) midline masses should be managed with oral broad spectrum antibiotics Avoid incision which can cause scarring complicating future excision of the developmental cyst. Instead, refer for aspiration (not incision and drainage) of a pus collection if present.
Submental lymph node	See management of lymphadenopathy below
Pharyngeal remnants	Patients with non-inflamed cystic masses or fistulae along the anterior boarder of the sternocleidomastoid muscle should have a non-urgent referral for review at the paediatric surgical outpatients department.
Lymphadenopathy	A careful assessment for features to suggest underlying conditions is essential. Important causes to consider are reactive lymphadenopathy due to a viral or localised infection, TB lymphadenopathy or the possibility of malignancy. Unexplained lymphadenopathy should be considered for further investigation by a general paediatric team.
Lymphadenitis	Patients with lymphadenitis, with no area of fluctuance and who are eating and drinking well can be managed with oral antibiotics. Cefalexin is a good choice. Patients who have decreased oral intake will need admission for ivi antibiotics until they are able to tolerate oral antibiotics. In this case of initial antibiotic management, parents should be warned that as the condition evolves, an abscess may develop. Patients with fluctuance of the affected lymph node at presentation or after initial antibiotics require incision and drainage of the abscess.
Lymphatic or vascular malformations	Patients with lymphatic and vascular malformations should have a non-urgent paediatric surgery outpatient department review.
Ranula	Patients with a ranula should have a non-urgent paediatric surgery outpatient department review.
Teratoma	Patients with lesions of the floor of the mouth which appear to be a tumour should be referred to paediatric surgery for urgent assessment.

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