Operative procedure (Non-core)

Reason/Evidentiary Support:

Accurate designation of the operative procedure requires appropriate information from the head and neck surgeon, ideally with specimen orientation. A single operation may encompass more than one of the above-designated procedures, and the terminology may vary by institution. Some experts have proposed eliminating the above terminology, in favour of a more simplistic designation that includes the lymph node levels received and a listing of non-lymphatic structures that accompany them.[1] In some cases, it is not possible to specify or be certain of the operative procedure, and thus this element is considered non-core.

NECK DISSECTION TERMINOLOGY

The best known classification of lymph node groups in the neck is the so-called Robbins' classification, originally proposed by the American Academy of Otolaryngology – Head and Neck Surgery[2] in which the lymph node basins of the neck are divided into levels I to VI, as per the anatomical boundaries described further below and illustrated in Figure 1. This classification only includes lymph nodes commonly removed during neck dissection procedures, and therefore it does not include all the head and neck node groups such as the facial nodes. Level VII (the superior mediastinal lymph node compartment) is included in the illustration for completeness, but except for thyroid cancer, it is rarely involved by head and neck cancer. Additional node groups are described in the TNM atlas terminology, which divides the nodes into 12 groups, including retropharyngeal, parotid, buccal, retroauricular and occipital nodes (see Figure 2).[3] Further subdivisions of several node levels, based on specific anatomical landmarks, has clinical significance because they tend to be involved preferentially by tumours of specific primary sites. For instance, level IIb is more commonly involved by primary tumours of the oropharynx or nasopharynx, than by primaries of the oral cavity, hypopharynx or larynx.[4]

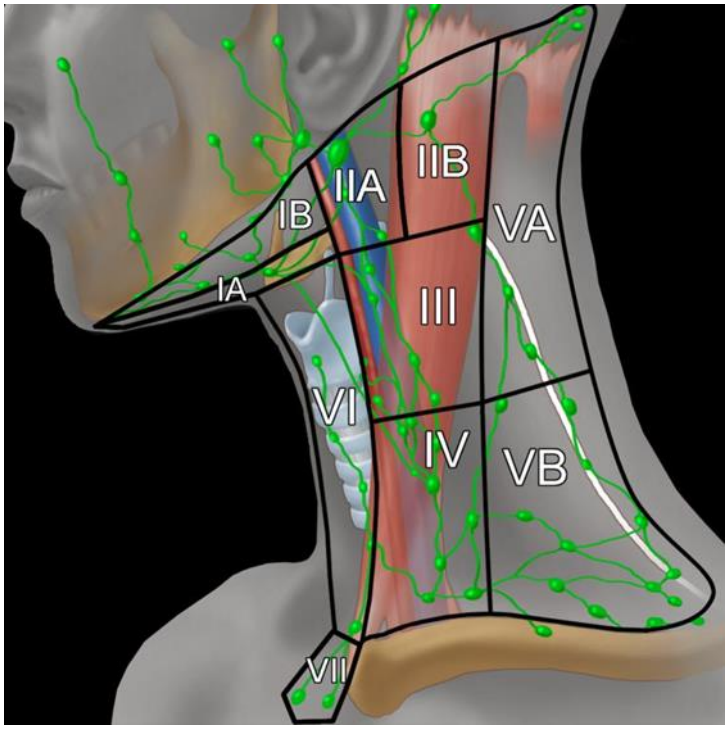

Figure 1. Illustration of the major neck lymph node levels, with anatomical boundaries, that are resected during neck dissections. *This figure was published in Imaging Anatomy: Brain, Head and Neck, Spine. Diagnostic and Surgical Imaging Anatomy, Cervical Lymph nodes, 2006, Gordon H and Harsnberger HR, page 253, Copyright Amirsys/Elsevier (2006). Reproduced with permission.*

The boundaries of the lymph node groups found within the levels and sublevels of the neck are as follows:[5]

Submental (sublevel IA)

Lymph nodes within the triangular boundary of the anterior belly of the digastric muscles and the hyoid bone. These nodes are at greatest risk for harbouring metastases from cancers arising from the floor of mouth, anterior oral tongue, anterior mandibular alveolar ridge, and lower lip.

Submandibular (sublevel IB)

Lymph nodes within the boundaries of the anterior belly of the digastric muscle, the stylohyoid muscle, and the body of the mandible. It includes the preglandular and the postglandular nodes and the prevascular and postvascular nodes. The submandibular gland is included in the specimen when the lymph nodes within the triangle are removed. These nodes are at greatest risk for harbouring metastases from cancers arising from the oral cavity, anterior nasal cavity, soft tissue structures of the midface, and submandibular gland.

Upper jugular (includes sublevels IIA and IIB)

Lymph nodes located around the upper third of the internal jugular vein and adjacent spinal accessory nerve extending from the level of the skull base (above) to the level of the inferior border of the hyoid bone (below). The anterior (medial) boundary is the stylohyoid muscle (the radiologic correlate is the vertical plane defined by the posterior surface of the submandibular gland) and the posterior (lateral) boundary is the posterior border of the sternocleidomastoid muscle. Sublevel IIA nodes are located anterior (medial) to the vertical plane defined by the spinal accessory nerve. Sublevel IIB nodes are located posterior (lateral) to the vertical plane defined by the spinal accessory nerve. The upper jugular nodes are at greatest risk for harbouring metastases from cancers arising from the oral cavity, nasal cavity, nasopharynx, oropharynx, hypopharynx, larynx, and parotid gland.

Middle jugular (level III)

Lymph nodes located around the middle third of the internal jugular vein extending from the inferior border of the hyoid bone (above) to the inferior border of the cricoid cartilage (below). The anterior (medial) boundary is the lateral border of the sternohyoid muscle, and the posterior (lateral) boundary is the posterior border of the sternocleidomastoid muscle. These nodes are at greatest risk for harbouring metastases from cancers arising from the oral cavity, nasopharynx, oropharynx, hypopharynx, and larynx.

Lower jugular (level IV)

Lymph nodes located around the lower third of the internal jugular vein extending from the inferior border of the cricoid cartilage (above) to the clavicle below. The anterior (medial) boundary is the lateral border of the sternohyoid muscle and the posterior (lateral) boundary is the posterior border of the sternocleidomastoid muscle. These nodes are at greatest risk for harbouring metastases from cancers arising from the hypopharynx, thyroid, cervical oesophagus, and larynx.

Posterior triangle group (includes sub levels VA and VB)

The group is composed predominantly of the lymph nodes located along the lower half of the spinal accessory nerve and the transverse cervical artery. The supraclavicular nodes are also included in posterior triangle group. The superior boundary is the apex formed by convergence of the sternocleidomastoid and trapezius muscles, the inferior boundary is the clavicle, the anterior

(medial) boundary is the posterior border of the sternocleidomastoid muscle, and the posterior (lateral) boundary is the anterior border of the trapezius muscle. Sublevel VA is separated from sublevel VB by a horizontal plane marking the inferior border of the anterior cricoid arch. Thus, sublevel VA includes the spinal accessory nodes, whereas sublevel VB includes the nodes following the transverse cervical vessels and the supraclavicular nodes with the exception of the Virchow node, which is located in level lV. The posterior triangle nodes are at greatest risk for harbouring metastases from cancers arising from the nasopharynx, oropharynx, and cutaneous structures of the posterior scalp and neck.

Anterior compartment group (level Vl)

Lymph nodes in this compartment include the pretracheal and paratracheal nodes, precricoid (Delphian) node, and the perithyroidal nodes including the lymph nodes along the recurrent laryngeal nerves. The superior boundary is the hyoid bone, the inferior boundary is the suprasternal notch, and the lateral boundaries are the common carotid arteries. These nodes are at greatest risk for harbouring metastases from cancers arising from the thyroid gland, glottic and subglottic larynx, apex of the piriform sinus, and cervical oesophagus.

Superior mediastinal (level VII)

Lymph nodes in this group include pretracheal, paratracheal and oesophageal groove lymph nodes, extending from the level of suprasternal notch cephalad and up to the innominate artery caudad. These nodes are at greatest risk of involvement by thyroid cancer and cancer of the oesophagus.

The most widely used classification of neck dissection procedures is based on the original system proposed by the Committee for Head and Neck Surgery and Oncology of the American Academy of Otolaryngology-Head and Neck Surgery in 1991.[2] This was revised in 2002[6] and updated in 2008.[7] The classification includes 4 basic procedures: *radical* neck dissection, *modified radical* neck dissection, *extended* neck dissection and *selective* neck dissection. The term *comprehensive* neck dissection refers to any neck dissection in which all nodes in levels I to V are removed, and therefore it includes *radical, modified radical* and *extended* neck dissections, as explained below.[8]

A *radical* neck dissection involves removal of levels I-V, as well the sternocleidomastoid muscle, spinal accessory nerve and internal jugular vein. A *modified radical* neck dissection spares at least one of the above non-lymphatic structures. An *extended* neck dissection involves removal of additional lymph nodes or non-lymphatic structures, beyond those removed as part of a radical neck dissection.

A *selective* neck dissection is a more limited procedure, in which one or more of the level I to V lymph node groups are spared, typically for malignancies of specific locations and with no or limited clinical evidence of lymph node involvement (N0 or N1).[9] S*upraomohyoid* neck dissection refers to removal of levels I to III, and is commonly performed for tumours of the oral cavity. *Lateral* neck dissection refers to removal of levels II to IV, performed for tumours of the larynx, oropharynx and hypopharynx. *Posterolateral* neck dissection refers to removal of levels II to V, for example for skin malignancies of the posterior scalp or upper, posterolateral neck.

Central or *anterior compartment* neck dissection removes level VI nodes (pretracheal, paratracheal, precricoid/Delphian and perithyroidal nodes) and is most commonly performed during surgery for thyroid carcinoma. Level VI lymph nodes are uncommonly received as neck dissections for head and neck skin or mucosal malignancies, but these nodes may be involved by primary cancers of the larynx or hypopharynx. Superior mediastinal nodes (level VII) may also be removed in central neck dissections, particularly for thyroid cancer.

A conspicuous member of the “other” category is the parotid lymph node basin, which is usually received as part of a parotidectomy specimen for primary salivary gland tumours or for metastatic skin cancers of the face and scalp (see Figure 2).

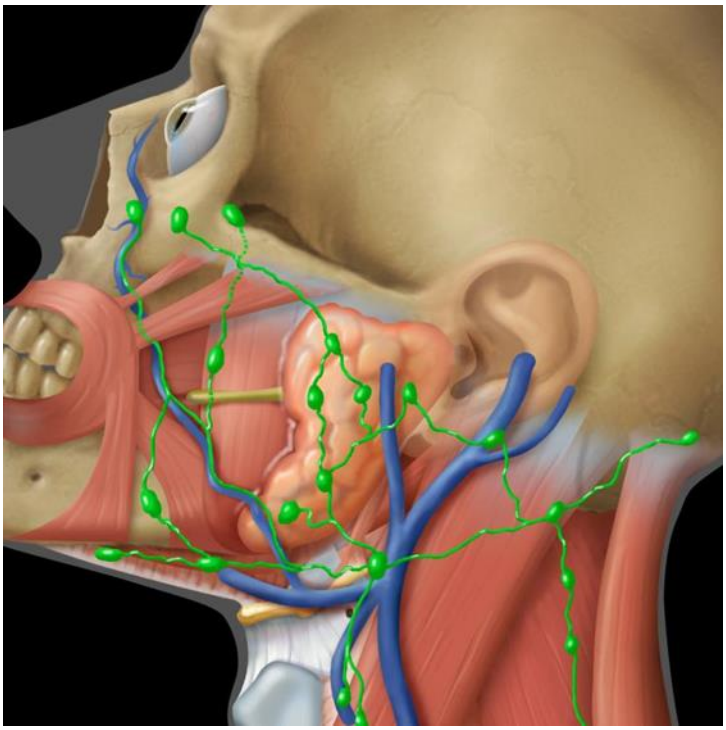

Figure 2. Head and neck lymph node groups of the facial area, including the parotid, bucco-facial, retroauricular and occipital groups. These nodes are more commonly involved with tumours of the head and neck skin and parotid gland. *This figure was published in Imaging Anatomy: Brain, Head and Neck, Spine. Diagnostic and Surgical Imaging Anatomy, Cervical Lymph nodes, 2006, Gordon H and Harsnberger HR, page 253, Copyright Amirsys/Elsevier (2006). Reproduced with permission.*

This dataset does not specifically address the issue of sentinel lymph node biopsy (SLNB) for head and neck cancers. The experience with SLNB is greatest for melanoma and breast cancer. While SLNB is a valid diagnostic technique to correctly predict the stage of regional nodes in head and neck cancer, it is not yet standard of care in most countries.[10,11] In general, the same principles of lymph node reporting as listed in this dataset can be applied to sentinel lymph nodes, except where additional information is required by local convention or study protocols. A negative sentinel lymph node supports the cN0 category, assuming a formal neck dissection has not been performed.[5]

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