

# The Delphian Node Revisited: An Uncommon Site of Recurrence

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The Delphian nodes (DNs) are frequently involved in cancers of the head and neck, including laryngeal and thyroid malignancies. Positivity in the DN has been considered a predictor of recurrence as well as an overall aggressive tumor biology. However, little has been written regarding the consequences of recurrence at the site of the DN. We present two case reports regarding recurrence in the DN and the unique challenges associated with DN metastases. In addition, we discuss our surgical approach to disease at the prelaryngeal space, including workup, imaging, and resection.

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**Freeform/Key Words:** delphian nodes, lymph node metastasis, recurrent cancer, thyroid cancer

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The prelaryngeal nodes, most commonly known as Delphian nodes (DNs), are frequently seen in the neck during surgery for malignant lesions of the thyroid. The term DN was initially described in 1948 and derives from the “Oracle of Delphi” secondary to the node’s prophetic role in predicting outcomes when involved with metastasis from head and neck malignancies [1]. There is no clear consensus as to whether these lymph nodes need to be resected at the time of total thyroidectomy for any type of differentiated or medullary thyroid cancer. A DN involved with metastatic thyroid carcinoma is thought to be a predictor of aggressive tumor biology [2]. This may increase the rate of metastatic central compartment and paratracheal lymph nodes. Aside from this predictive value, metastatic disease in the DN can lead to persistent or recurrent disease with possible invasion of surrounding structures when not resected. We present two cases of recurrence within the DN requiring surgical resection because of risk of invasive pathology and review the significance of DN resection in thyroid cancer.

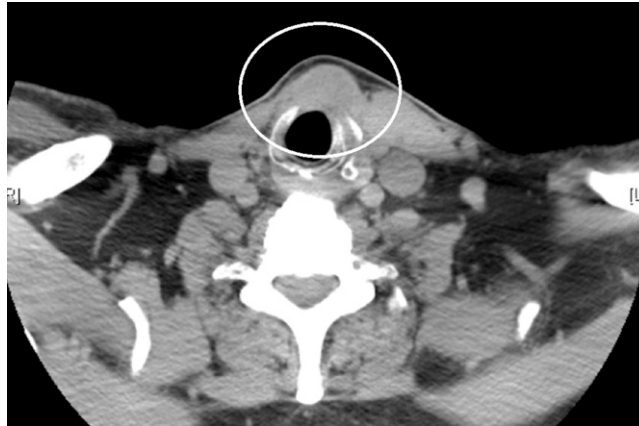
## 1. Case Reports

Our first patient is a 77-year-old man who presented in 2000 with a right 6-cm medullary thyroid carcinoma. He underwent a right thyroid lobectomy and was disease free until 2010, when recurrence in his right neck was treated with a right modified radical neck dissection. In 2017, his carcinoembryonic antigen was elevated to 43.3 ng/mL (normal, 0.0 to 5.0), and his calcitonin level was 5927 pg/mL (normal, <14.3), with a large palpable midline neck mass. On a computed tomography scan, a 2.2-cm nodule was identified anterior to the trachea, consistent with medullary carcinoma metastatic to a DN (Fig. 1).

Our second patient is a 71-year-old man who underwent a total thyroidectomy in 2000 for a papillary thyroid carcinoma and a subsequent modified radical neck dissection in 2001, with three rounds of radioactive iodine in 2000, 2001, and 2005 at an outside facility. A positron

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Abbreviation: DN, Delphian node.

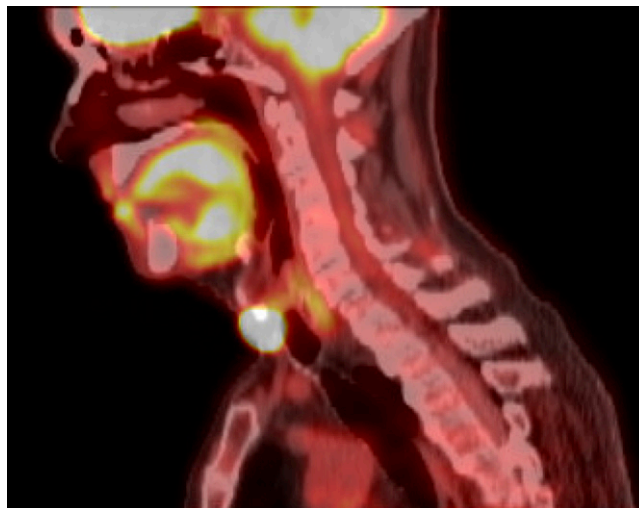


**Figure 1.** Axial CT scan of the neck. A 2.2-cm pretracheal DN involved with metastatic medullary cancer is shown anterior to the trachea, between the thyroid and cricoid cartilage.

emission tomography scan in 2017 revealed an avid lesion between the cricoid and thyroid cartilage, and a corresponding computed tomography scan demonstrated a 1.8-cm mass at the DN (Fig. 2). The patient underwent surgical resection with an intimately associated DN superior to the cricoid cartilage. The DN was densely adherent to the trachea but was removed with <1-mm negative margin and pathology demonstrating a metastasis within the DN.

## 2. Discussion

A literature search regarding the DN and its involvement with thyroid malignancy revealed scant information, with <500 patients reported in retrospective reviews. Iyer *et al.* [2] previously reported their experience with resection of DN in 101 patients, with 25% of those with medullary and papillary thyroid carcinomas having DN metastases at the time of thyroidectomy. The size of lymph node metastasis ranged from 0.1 to 1.3 cm, with a median size of 0.3 cm. This was further delineated by Isaacs *et al.* [3] with a DN metastasis rate of 21%. This had important prognostic implications for greater nodal disease in both the central and lateral neck compartments. A review of the literature (Table 1) revealed an association with tumors present in the isthmus or upper third of the thyroid and more than 79% of patients having



**Figure 2.** A positron emission tomography scan (sagittal view) shows an avid lesion corresponding to a 1.8-cm DN involved with metastatic papillary carcinoma with infiltrative borders.

**Table 1. DN Positivity During Thyroidectomy for Differentiated Papillary Thyroid Cancer**

	No. of Patients	% + DN	Additional % + LN	Mean Tumor Size
Iyer <i>et al.</i> [2]	101	25%	72%	18 mm
Isaacs <i>et al.</i> [3]	103	21%	90%	13 mm
Chai <i>et al.</i> [4]	370	12%	79.1%	18 mm

Abbreviation: +LN (positive lymph node).

additional positive level VI nodes when metastasis was present in the DN [2–4]. In fact, it has been postulated that the DN may be the “sentinel node” of thyroid malignancies [5, 6]. Its predictive significance is not clear, although a recent review by Chai *et al.* [4] associated positivity at the DN with larger tumors, extrathyroidal extension, and lymphovascular invasion.

The high rate of positivity is notable because these nodes are rarely reported as suspicious on preoperative ultrasonography. These nodes are not consistently resected and are not specifically addressed in the current 2016 American Thyroid Association guidelines for thyroid nodules and differentiated malignancy or in the eighth edition of the American Joint Committee on Cancer staging system [7].

Scant literature has specifically examined the consequences of leaving the DN in place. In differentiated thyroid cancer, lymph node metastasis does not impact overall survival but can be a factor in the disease-free interval [8]. The 20% to 25% rate of metastasis to the DN is an important consideration with attempts to render a patient disease free at initial operation. The DN can be difficult to identify when not purposefully sought and resected. It can be split or damaged when the strap muscles are separated when opening the neck. It can be concealed under the pretracheal fascia, mimicking cricoid muscle, a pyramidal lobe, or fatty tissue.

When the DN is left in place, consequences can include an elevated postoperative thyroglobulin, carcinoembryonic antigen, or calcitonin level, especially when infiltrated with substantial tumor. It can become a cosmetic concern for patients because its superficial location can lead to a double chin appearance or Adam’s apple morphology in female patients.

More importantly, its location between the thyroid and cricoid cartilage can lead to tracheal invasion when left in place. It is unlikely that a patient will require a total laryngectomy. Cross-sectional imaging used in conjunction with ultrasonography is a necessity to define the extent of disease and relation to critical structures. When neglected, the DN can grow into the endolarynx and be an indication for laryngeal resection. During surgery, it is important to avoid a tear in the cricothyroid membrane; however, when gross invasion is present, removal of a portion of the membrane or cricothyroid muscle with cricothyrotomy or tracheostomy may be needed to achieve an R0 resection.

In the presence of advanced disease, as in these two patients, the current experience reported from Australia, Korea, and New York indicates that 20% to 25% of patients will have metastatic disease within the DN [2–4]. The DN should be removed as part of the clearance of the central compartment. This involves removal of tissue from the prelaryngeal space at the cricothyroid membrane down to the thoracic inlet inferiorly and laterally up to the carotid artery, taking care to protect the parathyroid glands and recurrent laryngeal nerve.

Although the need for clearance of central nodes has been a source of debate for many years, we routinely remove these nodes, especially when gross disease is evident, to prevent recurrent disease. Our practice is to use a frozen section for examination of the DN. When this is positive, we pay closer attention to the central compartment lymph nodes in the paratracheal space, which are more likely to be positive. Clearance of this area allows for removal of potentially recurrent lymph nodes that may be difficult to resect during a subsequent operation.

### 3. Conclusion

The DN is an underrecognized site of metastasis in medullary and differentiated thyroid cancer. Aside from the DN’s predictive value in metastasis, the risks of persistent disease and

recurrence support resection of the node during the initial operation to prevent a potentially treacherous reoperation.

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