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# **Delphian lymph node in glottic carcinoma subjected to supracricoid partial laryngectomy with cricohyoidoepiglottopexy**

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## **Resumen**

**Objetivo:** las metástasis al ganglio delfiano se presentan de manera poco frecuente en tumores laríngeos. Este reporte describe su frecuencia en pacientes con cáncer glótico sometidos a laringectomía parcial supracricoidea con cricohyoidoepiglottopexia.

**Material y métodos:** catorce pacientes (13 hombres y una mujer) con una media de edad de 58 años, se sometieron a laringectomía parcial supracricoidea con cricohyoidoepiglottopexia y disección cervical funcional bilateral (niveles II a V) en búsqueda del ganglio delfiano. Cuatro pacientes se encontraban en estadio I, cinco en II, cuatro en III y uno en IV. Los márgenes quirúrgicos y el ganglio delfiano fueron analizados en todas las laringectomías parciales supracricoideas.

**Resultados:** la media de seguimiento fue de nueve meses. La disección cervical derecha obtuvo en promedio 18 ganglios y la del lado izquierdo 22, con ningún ganglio afectado en el análisis definitivo. Sólo un paciente (7%) tuvo afección tumoral en el ganglio delfiano y seis meses después se encontró un ganglio linfático cervical metastásico ipsilateral a la lesión del cuello. Se sometió al paciente a radioterapia estándar (66 Gy) dirigida a la laringe y áreas ganglionares, así como a región supraclavicular (20 Gy).

**Discusión:** la disección cervical funcional bilateral está indicada ante afección tumoral al ganglio delfiano. La radioterapia postoperatoria puede ser usada de manera ocasional en ganglio delfiano positivo, a pesar de reportes negativos de las disecciones cervicales en laringectomía parcial supracricoidea debido a otras probables rutas de diseminación. La disección cervical funcional bilateral debe ser indicada basándose en la localización y tamaño del tumor.

**Palabras clave:** ganglio delfiano, laringectomía parcial, cáncer glótico, cricohyoidoepiglottopexia.

## **Summary**

**Introduction:** Metastases to Delphian lymph node is rarely present in laryngeal malignancy. This report describes its frequency in patients with glottic cancer undergoing supracricoid partial laryngectomy (SCPL) with cricohyoidoepiglottopexy (CHEP).

**Material and methods:** Fourteen patients (13 male and 1 female) with a mean age of 58 years underwent a SCPL with CHEP and functional bilateral neck dissection (levels II-V) searching for the Delphian lymph node. Four patients were in stage I, five in stage II, four in stage III, and one in stage IV. Surgical margins and Delphian lymph nodes were searched for in each partial laryngectomy sample.

**Results:** The mean follow-up was 9 months. The right-side dissection yielded an average of 18 lymph nodes and the left-side dissection yielded an average of 22 lymph nodes, with no metastatic disease on the ultimate examination. Only one patient (7%) revealed a carcinoma-positive Delphian lymph node, and 6 months later a metastatic lymph node was found on the same side as the primary tumor. The patient underwent standard radiation therapy (66 Gy) targeted to larynx and lymph node areas, as well as to the supraclavicular region (20 Gy).

**Discussion:** Bilateral functional dissection is indicated in the presence of Delphian lymph node metastatic spread. Post-operative radiation therapy may occasionally be used as an adjuvant treatment in cases with positive Delphian lymph node in spite of a negative functional dissection in partial laryngectomies due to other possible node spread routes. Bilateral functional dissection should be chosen based on tumor site and size.

**Key words:** delphian lymph node, partial laryngectomy, glottic cancer, cricohyoidoepiglottopexy.

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### *Solicitud de sobretiros:*

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## Introduction

The cricothyroid prelaryngeal lymph node or Delphian node has been previously defined and analyzed from a historical point of view. This node lies between the thyroid and cricoid cartilages and drains the thyroid gland and larynx, which includes a complex drainage system as it may collect fluid from its three segments (supraglottis, glottis, and subglottis).<sup>1</sup> The frequency of Delphian node metastatic disease in patients with larynx cancer is unknown, but it has been estimated that 1 in every 100 patients with this malignancy have metastatic Delphian node. The probability of metastatic disease from a glottic carcinoma, according to T-grade, is <1% for T1 malignancies, nearly 7% for T2, and <20% for T3,<sup>2</sup> this is particularly significant due to the increased frequency of conservative larynx surgery.

The present report describes the frequency of Delphian node in a group of patients with glottic carcinoma who underwent a supracricoid partial laryngectomy (SCPL) with cricothyroidoepiglottomy (CHEP).

## Material and Methods

The study group comprised 14 patients with a diagnosis of glottic epidermoid carcinoma, who were treated at the Instituto Nacional de Cancerología in Mexico City between June

2000 and September 2002. All patients were staged according to AJCC.<sup>3</sup> Four patients were in stage I, five in stage II, four in stage III, and one in stage IV.

All patients underwent direct and indirect laryngoscopy obtaining a biopsy sample whenever feasible. When tumor extension was uncertain and in patients in whom a biopsy was not feasible, a suspension microlaryngoscopy was performed. Similarly, all patients underwent a CT scan. Routine MRIs were not performed owing to the lack of availability of the equipment in our institution.

Ten patients received primary treatment; three were treated due to postradiation therapy recurrence and one due to a histopathologically positive anterior commissure after laser endoscopic excision completed with surgery (Table 1). All patients underwent SCPL with CHEP, bilateral neck dissection in levels II to V, and deliberate search of Delphian node with transoperative examination as proposed by Olsen et al.<sup>1</sup> Adjuvant radiation therapy was not considered since post-radiation tissue reaction invalidates the functional principles of conservative surgery.<sup>4</sup> Surgical margins were evaluated during surgery in all SCPL samples.

## Results

The study group comprised 13 men and one woman, with a mean age of 58 years (range, 37-78 years). Tumor staging is

**Table 1.** Clinicopathological correlation and histological grade

Case	T	N	Clinical stage	Tp	Np	Pathological stage	Histological grade
1	1a	0	I →	1b	0	I	Well differentiated
2	1b	0	I →	2	0	II	Well differentiated
3	3	0	III	3	1	III	Moderately differentiated
4	3	0	III	3	0*	III	Moderately differentiated
5	1a	0	I	1a	0	I	Moderately differentiated
6	2	0	II →	3	0	III	Moderately differentiated
7	2	1	III	2	0	II	Well differentiated
8**	1b	0	I →	2	0	II	Well differentiated
9***	4	0	IVa	2	0	IVa	Well differentiated
10**	2	0	II	2	0	II	Moderately differentiated
11**	2	0	II	2	0	II	Well differentiated
12	2	0	II	2	0	II	Well differentiated
13	2	0	II ←	1a	0	I	Well differentiated
14	3	0	III	3	0	III	Well differentiated

\* The patient had lymph node metastases of a co-existing papillary thyroid carcinoma

\*\* Postradiation therapy recurrence

\*\*\* CO<sub>2</sub> laser resection

→ or ← show change in clinical stage

shown in Table 1. Mean follow-up for this group was 9 months (range, 1-18 months).

An average of 18 (range, 9-30) lymph nodes was found in right-sided dissections and 22 (range, 9-47) in left-sided dissections. Only one patient had a carcinoma-positive Delphian node (case #4), which was diagnosed during surgery. The ultimate result was metastatic epidermoid carcinoma without capsular rupture, and the report from both necks was metastasis-negative. Therefore, observation was chosen in this case. This patient suffered a relapse at 6 months of follow-up in level V on the same side of the primary tumor. A neck dissection at that time disclosed one lymph node positive for epidermoid carcinoma, and as a result the patient was referred to radiation therapy where 66 Gy was administered to larynx and lymph node areas and 20 Gy to the supraclavicular region. At present, 15 months after this event, the patient is alive and free of disease.

A thyroid papillary carcinoma was found during surgery of patient #5, and accordingly a simultaneous total thyroidectomy was performed. One enlarged lymph node located on the same side of the tumor was histopathologically confirmed to be a metastatic lesion, and for this reason the patient underwent radionuclide scanning using  $^{131}\text{I}$  with a negative result and received suppressive therapy with thyroid hormones.

Table I compares the clinical and pathological staging, showing T understaging in four cases, and in two of them clinical stage had to be modified as well. In addition, stage modification in case #9 was due to overstaging, since lymph node enlargement had been palpable but its pathological findings were negative to metastasis.

## Discussion

The organs that may produce metastases to the Delphian node are larynx and thyroid gland. More than 90% of the cases originating from the larynx are epidermoid carcinomas, while most metastatic thyroid tumors are well-differentiated papillary carcinoma. However, it is important to note that prognosis and treatment differ in both cases, since the presence of a Delphian node in well-differentiated thyroid carcinomas has no impact on survival.<sup>5</sup> This is evident in the present series where one patient experienced simultaneous larynx carcinoma and thyroid papillary carcinoma with metastatic disease; nevertheless, the larynx carcinoma had no lymph node metastasis, and this finding determined the prognosis (Table 1).

According to T staging, the probability of metastatic disease in a glottic carcinoma is < 1% for T1 malignancies, nearly 7% for T2 neoplasms, and < 20% for T3 tumors.<sup>2</sup> Johnson et al.<sup>6</sup> found 10.4% of laterocervical metastases in clinically N0 malignancies; Piquet and Chevalier<sup>7</sup> described

20% of laterocervical metastases in pathologically T2 and T3 tumors and a 6% recurrence for T1 tumors not treated with SCPL. This is the basis for elective neck dissection in these patients. The present series describes bilateral elective neck surgery as a larynx conservative treatment, as proposed by Filipowski et al.<sup>4</sup> and Bocca et al.,<sup>8</sup> who demonstrated that elective functional dissection offers the best oncologic safety warranty. However, four (23%) of our patients were T understaged, which also justified the supplementary neck dissection and reinforces the need for better staging methods. In spite of this, no patients in this series has shown metastasis in the functional dissections, which allows the assumption that in the near future the indication in glottic neck carcinoma will depend solely on the site and size of the tumor, as stated by Vincentis et al.,<sup>9</sup> who could not find a clear indication for elective dissection and performed this surgery in 4% of SCPL patients.

Candela et al.<sup>10</sup> and McGrayran et al.<sup>11</sup> found a predominance of metastases to levels II to IV, but none of these authors makes reference to either the Delphian node or the paratracheal nodes in larynx cancer.

The frequency of Delphian node metastatic disease in larynx malignancy is very low, as shown by Olsen et al.<sup>1</sup> in their review of 2232 laryngectomy samples where they found only 20 cases of Delphian node metastases. Thirteen had a glottic primary tumor, indicating a 0.5% incidence. Thaler et al.<sup>12</sup> reported a positive Delphian node in 2/40 patients with glottic malignancy, which represents 5%. This figure is consistent with the findings of other authors who have shown an incidence of Delphian lymph node metastases ranging from 0.9% to 12.5%.<sup>13-16</sup>

Thaler et al.<sup>12</sup> have shown a 50% mortality rate in presence of a Delphian node, in contrast to a 21% mortality rate when this node is absent. The rationale may be that the Delphian node has lymphatic connections with the subdelphian nodes, which communicate with the mediastinal and supraclavicular nodes (level V), as well as the inferior thyroid artery, paratracheal, and low jugular nodes (level IV).<sup>1</sup> In the present Delphian node case, a bilateral functional dissection was performed, and 6 months later ipsilateral supraclavicular metastases occurred. Based on the above-mentioned possibility of lymph node metastases in other areas, standard neck and larynx radiation therapy was given. This was contrary to Laccourreye's suggestion for conservative surgery, where he spares the larynx with the purpose of protecting its function due to its deterioration after radiation therapy.<sup>17</sup> However, in the present study, the function remained normal.

Modifications in surgical concepts focused towards organ preservation with the purpose of maintaining the function without sacrificing the oncological concepts of radicalism have allowed to leave behind some contraindications for conservative surgery as proposed by Jackson,<sup>18</sup> who believed that a

positive Delphian node was a contraindication for laryngofissure and cordectomy.

In conclusion, bilateral functional dissection is well indicated in presence of metastatic Delphian node. Postoperative radiation therapy may be exceptionally used as an adjuvant treatment in cases of a positive Delphian node, in spite of negative functional dissection during partial laryngectomies, due to the possibility of alternative lymph node spread routes. Bilateral functional dissection should be chosen based on the site and size of the tumor.

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