



Research Article

ISSN : 2277-3657  
CODEN(USA) : IJPRPM

## ***Routine Bilateral Neck Dissection in Management of Supraglottic Carcinoma***

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### **ABSTRACT**

*Objectives : To determine the importance of bilateral neck dissections which is done as a routine procedure in patients with supraglottic carcinoma and N0 neck, in terms of detecting the incidence of positive lymph nodes on the contralateral side. Study Design : Prospective study including 50 patients with supraglottic carcinoma & N0 neck. Setting : 50 patients were admitted from Otolaryngology department, Kasr-Al Aini hospital, Cairo University during the period from January 2016 till August 2017. Subjects and Methods : All patients were diagnosed with supraglottic carcinoma with N0 lymph nodes. Bilateral neck dissections were done – in conjugation to laryngectomy - to detect the incidence of the positive contralateral lymph nodes in these cases. Those with the extensive tumor midline cross over, unfit ones, or who were refusing surgery were excluded. Results : In this study, 48% of the cases had positive lymph nodes on the ipsilateral side while 16% had positive lymph nodes on the contralateral side. Level II on both sides was the most affected with 67% on the ipsilateral side & 100% on the contralateral side. A correlation was detected between the T-stage of the primary lesion of the larynx and the incidence of positive lymph nodes for both sides of neck ( $p$  value  $<0.05$ ). It was also revealed that the incidence of the contralateral positive neck nodes was increased as the incidence of the ipsilateral positive nodes increased in N0 cases ( $p$  value  $<0.05$ ). Conclusions : It could be concluded that bilateral neck dissections should be routinely done in cases of supraglottic carcinoma N0 patients, especially with the higher T stages.*

**Key words:** *Supraglottic Carcinoma, N0 Neck, Total Laryngectomy, Bilateral Neck Dissections.*

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### **INTRODUCTION**

Supraglottic cancer is the second most common site of cancer in larynx, but it has been known to produce the most common cervical lymph node metastasis. This nodal metastasis is often bilateral ; therefore, bilateral neck dissections should be performed in conjunction with laryngectomy. The supraglottic region has numerous sub mucosal lymphatic plexus, which gives rise to bilateral involvement of cervical lymphatic system owing to its embryological development. However, there has been no consensus about how frequently unilateral supraglottic cancer metastasizes to contralateral lymphatics [1].

Structures in the larynx in well-lateralized location (false vocal cord, ventricle, aryepiglottic fold, etc.) are likely to spread to ipsilateral cervical side, while those in central location in larynx have an increased incidence of sending metastasis to both sides of neck. This is because of the allocation of the lymphatic drainage of the supraglottic area. However, this principal has some exceptions especially when there is an ipsilateral involvement of the neck nodes which creates an additional risk for the development of positive nodes on the contralateral side of neck especially when the ipsilateral nodes are multiple and large [2].

The prognosis of supraglottic carcinoma is mainly relying on the cervical metastasis, even in cases of small laryngeal cancers, so the cervical metastasis has a greater effect on the survival of these patients than does the primary lesion of the supraglottic larynx. Accordingly, failure to treat the neck nodes in cases of supraglottic cancer is the most likely cause of the recurrences in many of these cases [3].

Many authors have disputed in favor of doing bilateral neck dissections in patients of supraglottic laryngeal carcinoma even if the patients have been presented with N0 neck. This has been due to the high incidence of the affection of both or the opposite side in these patients because of the histological predominance even if the patients had a lateral lesion. Also, doing bilateral dissections would help in eradicating the N0 nodes that harbor malignancy to be detected pathologically, and also assist in the proper staging and accordingly the treatment and prognosis. Furthermore, the results of doing bilateral neck dissections in supraglottic cancers would lead to the lower incidence of recurrences in follow-ups [4].

#### **Aim of the Study**

The aim of this study was to determine the importance of bilateral neck dissections, as a routine procedure in patients with supraglottic carcinoma and N0 neck, and candidate for laryngectomy.

#### **MATERIALS AND METHODS**

This study was conducted on 50 patients who were admitted at the Otolaryngology-Head and Neck surgery department, Kasr-Al Aini hospital, Cairo University during the period from January 2016 till August 2017. All patients were diagnosed with supraglottic carcinoma with N0 lymph nodes.

Informed consent from all the patients, and ethical approval from the ethical committee (Cairo University) were obtained.

All the patients were subjected to a preoperative assessment protocol that included history taking, examinations and investigations such as radiology, where CT scan of neck with contrast included axial and coronal cuts, and sagittal reconstruction was done to detect the actual size of the tumor, its extension, cartilage invasion, the possibility of extra-laryngeal spread, non-palpable nodal metastasis and invasion of the para-glottic and pre-epiglottic spaces which are important for not leaving residues of tumor during surgery, and helping in accurate staging.

Direct laryngoscopy under general anesthesia was done to report the site and extent of the primary tumor for a proper T stage, and take biopsy for histopathological examination to confirm the diagnosis. Metastasis work-up included chest CT and abdominal ultrasound which were done to evaluate distant metastases.

Routine counseling of the patients about voice and swallowing expectations was done. A written consent was taken for the operation. The patient was told of the need for a temporary nasogastric tube and tracheostomy. The surgeries for the primary tumor and the neck dissections were done in the same setting.

- 1. Surgery for the primary tumor :** The surgeries performed included total or partial laryngectomy selected according to the site and stage of the primary tumor.
- 2. Surgery for lymph node control :** Selective neck dissections were performed bilaterally (all of which were lateral selective neck dissections on level II, III & IV).

#### **Processing the excised specimen :**

The specimen including the laryngectomy and the neck dissections as was immersed into a container of formalin, was sent to the pathology department, where the specimen was sliced and examined microscopically for a thorough histopathological examination by a pathologist with the documentation of the data for each patient including confirming the diagnosis, degree of tumor differentiation, site, size & extensions of the primary lesion, free versus invaded margins, cartilage invasion, and any positive nodes on both sides of neck dissections, including their number and levels.

#### **Post-Operative Care:**

The patient was nursed, head up with nothing by mouth for 7-12 days. Intravenous broad-spectrum antibiotics were prescribed. Intravenous fluids were given as appropriate, along with routine analgesics for pain management. Nasogastric tube feeding was commenced 24 hours after the surgery, and continued for 7-12 days. The care of the tracheostomy tube was given appropriate attention.

On the 7<sup>th</sup> to the 10<sup>th</sup> day, oral feeding was attempted with milk to see if there was leakage from the neck or wound site, if there was none, fluids were continued in graded fashion with the nasogastric tube in place; and if after 24 hours there was still no leakage, the nasogastric tube was removed. Graded fluid-form high-protein diet was continued for 1 week before semisolids were commenced in a graded manner before the introduction of solids. Stitches were removed on the 6<sup>th</sup> to the 7<sup>th</sup> postoperative days. The patient was referred for the postoperative radiotherapy, generally 6 weeks after the surgery if needed.

## RESULTS

This study included 48 male and 2 female patients. The age of the patients ranged from 45 till 72 years with the mean value of 58.80. Most of the patients presented with stage T4 representing 22 cases with the percent of 44% of total cases, 20 cases presented with T3 staging with the percent of 40%, & 8 cases were of T2 with 16%.

In this study, a correlation was detected between the T-stage of the primary lesion of the larynx and the incidence of positive lymph nodes detected on the postoperative pathological analysis (**p value <0.05**) for both sides of neck. T2 cases showed positive lymph nodes in two cases only on the ipsilateral side & no positive lymph nodes on the contralateral side. In cases of T3 and T4, the neck dissections yielded more positive lymph nodes on both sides of the neck with T3 showing 10 cases of positive lymph nodes on the ipsilateral side, and 2 cases had contralateral positive nodes. T4 cases had 12 cases of positive ipsilateral lymph nodes, and 6 cases had contralateral positive nodes.

In this study, total laryngectomy was performed in most of the cases (39 cases) representing 78%, while partial laryngectomy was performed 11 times representing 22%, with 6 cases in the form of supracricoid laryngectomy & 5 cases in the form of supraglottic laryngectomy.

The total number of cases with positive lymph nodes on the ipsilateral side was 24 cases with the percent of 48%, and 8 cases had positive lymph nodes on the contralateral side with the percent of 16%, as shown below :

This study showed that the incidence of the contralateral positive nodes was directly related to that of the positive ipsilateral nodes, where 6 cases out of 8 cases (75%) with the contralateral positive nodes had also positive ipsilateral neck nodes, and only 2 cases had positive contralateral nodes without positive ipsilateral nodes (p value <0.05).

In this study, level II had the most positive nodes on both sides of the neck with 16 cases (67%) on the ipsilateral side & all 8 cases (100%) on the contralateral side. For level III, there were 6 cases (25%) on the ipsilateral side with none on the contralateral side. 2 cases (8%) had positive nodes at the level IV on the ipsilateral side, and again none on the contralateral side.

## DISCUSSION

The proper management of the clinically negative (N0) neck has remained as a subject of much debate. The main question that has remained is : in the clinically N0 neck, whether steps should be taken to eradicate occult metastases or not. If the decision is made to do this, should it be by surgery or by irradiation, and should it be only on the side of the lesion or on both sides ? [5].

There has been a general agreement in that the surgical treatment of the primary tumor should be performed in conjunction with the bilateral neck dissection in patients with ipsilateral or bilateral N+ neck(s). The indication to treat both sides of the neck electively in patients with clinically N0 necks has been less clear [6].

In this study, a correlation was detected between the T-stage of the primary lesion of the larynx and the incidence of positive lymph nodes detected on the postoperative pathological analysis (p value <0.05) for both sides of neck.

**Cagh et al.** [7] reported that the prevalence of the bilateral occult metastasis proportionally was increased with T stage from 8.3 to 22.7% and to 31.2% ; respectively, for T2, T3 and T4.

**Luca et al.**, [8] also showed an increased incidence of the occult lymph node metastases as the T stage was increased, with T1, T2, T3& T4 cases showing 0%, 20%, 25% & 40%; respectively.

**Kaur et al.**, [9] observed in their study that as the T stage progressively advanced, the incidence of the nodal metastases also progressively increased - 8.3% (1 case) showed metastases out of 12 T1 lesions, 20% (1 case) showed nodal metastases out of 5 T2 lesions, 50% (8 cases) showed nodal metastases out of 16 T3 lesions and 64.7% (11 cases) showed nodal metastases out of 17 T4 lesions.

On the other hand, **Amar et al.**, [10] stated that although the T staging has been very important in the definition of the risk of ipsilateral metastases, its relationship with the risk of contralateral metastases seemed to be indirect, considering that the tumor size has been associated to the possibility of reaching areas (anatomical subsites) with the crossed lymphatic drainage. The T stage alone did not prove applicable in indicating the contralateral elective dissection.

In this study, it has been revealed that the incidence of contralateral positive neck nodes was increased as the incidence of the ipsilateral positive nodes in N0 cases had a p value of less than 0.05.

**Öztürkcan et al.**, [11] reported a frequency of contralateral metastasis in the laterally located supraglottic cancers with largely involving one side, and not crossing the midline was significantly higher in the patients with ipsilateral node metastases than the patients without ipsilateral metastatic nodes (44 and 5.3%, respectively)

**Gallo et al.** [12] found contralateral metastases in 40.9 and 36% of the patients with and without ipsilateral extracapsular tumor spread, respectively.

**Luca et al.**, [8] concluded that the strictly lateral tumors with the contralateral metastases were observed in 5% of the patients only in the absence of the ipsilateral positive nodes, and increased to 12% when the ipsilateral metastases were present.

In this study, level II had the most positive nodes on both sides of the neck with 16 cases (67%) on ipsilateral side, and all 8 cases (100%) were on the contralateral side. For level III, there were 6 cases (25%) on the ipsilateral side with none on the contralateral side. 2 cases (8%) had positive nodes at the level IV on the ipsilateral side, and again there was none on the contralateral side.

In his study, **Djordjevic et al.**, [13] concluded that the level II showed the greatest incidence of the positive nodes with 77.5% of the cases, while 20% were in level III, and only 2.5% were in level IV.

According to the study done by **Amar et al.** [10], the metastases were concentrated in levels II and III, which represented the first drainage stage of these tumors, enabling a super-selective dissection only in these levels in a negative neck. Isolated metastases outside of this level were rare, and happened in only around 1% of the cases.

**Deganello et al.**, [14] showed that the incidence of the involvement per level was : 47.6% at level II, 38.1% at level III, 9.5% at level IV.

**Grene et al.**, [15] reported that level II (superior jugular lymph node chain) was the most commonly involved level with head and neck cancers.

**Çagh et al.**, [7] showed that level II was the most involved zone (19 necks of 16 patients) followed by level III (7 necks of the 16 patients). Level II involvement was associated with level III positivity in 7 patients. Level II through level IV involvement was determined in only 1 patient. Isolated level III and IV positivity was not established.

**Luca et al.**, [8] confirmed that the process of metastasis follows a fairly predictable pattern. Levels II or III were the first involved in every patient, whereas levels I, IV, and V were only affected in conjunction with the former levels. For occult metastases, the same pattern of distribution was observed.

In the present study, it was observed that the elective bilateral neck dissections for cases of lateralized supraglottic carcinoma yielded eight cases of positive contralateral lymph nodes with the percent of 16% in all cases.

**Lutz et al.**, [16] reported a 20% incidence of recurrence in the cervical region irrespective of the use of postoperative radiotherapy (at mean dosage of 62 Gy for 99 patients). The current series of patients treated with bilateral neck dissection demonstrated a regional recurrence rate of 9%.

In addition, **Bailey**, [17] proposed that the bilateral neck dissection allowed the removal of subclinical and subpathologic metastases, and thus allowed the accurate staging and treatment of the occult diseases and assisted in patient counseling and prognostication.

**Djordjevic et al.**, [13] yielded that the incidence of the postoperative regional recurrences was much higher in patients in whom the bilateral selective neck dissection was not performed simultaneously with the primary tumor operation, but with no influence on the 5-year overall survival rate.

**Amar et al.**, [10] concluded that the contralateral metastases in lateral tumors were observed in 26% of supraglottic lesions.

**Chiu et al.**, [4] argued in favor of the bilateral neck dissections because of the high histological prevalence of bilateral or contralateral diseases in supraglottic carcinomas, even in lateral tumors, as they reported this resulted in reduced neck recurrences.

**Godden et al.**, [18] postulated an important argument in favor of the bilateral procedure and declared that the better survival rate was observed in patients in whom the occult cancer was removed compared to that of those patients who were only treated if metastases were clinically manifested.

**Çagh et al.**, [7] in their study did not support the use of routine bilateral neck dissection in the treatment of all the lateral supraglottic carcinomas with the clinically N0 neck.

## CONCLUSION

In the present study, depending on the number of the postoperatively assessed positive lymph nodes on both sides of the neck, it could be concluded that in performing selective neck dissections for supraglottic carcinoma, the

supraglottic area should be regarded as a midline structure, with the expected metastatic nodes on both sides of the neck.

It could also be concluded that there was a correlation between the T stage of the primary supraglottic carcinoma and the incidence of positive nodes on both sides of neck. Also, a correlation was found between the positive nodes on the ipsilateral side and that of the contralateral side. It was also found that level II is the most commonly affected level in cases of supraglottic carcinoma on both sides of neck.

Finally, the authors would recommend to do a bilateral selective neck dissection in cases of supraglottic carcinoma even in lateralized lesions with N0 neck, as an effective management of the disease.

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**Table 1:** T stage distribution

		Count	%
T stage	T2	8	16%
	T3	20	40%
	T4	22	44%

**Table 2:** Correlation between the T stage & positive nodes on both sides of neck

	T2	T3	T4
Ipsilateral	2	10	12
Contralateral	0	2	6

**Table 3:** Type of surgery for the primary supraglottic carcinoma

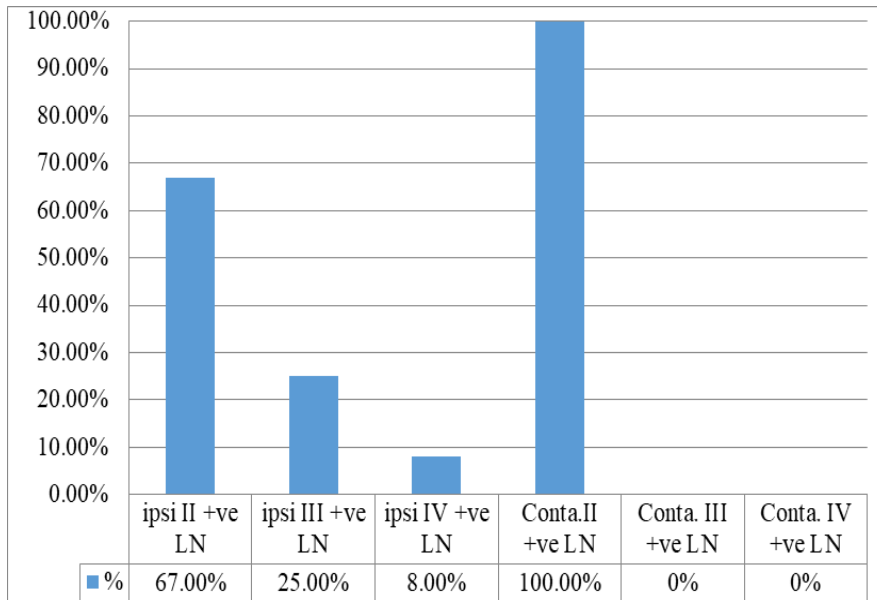
Type of Operation	Partial Laryngectomy		Total Laryngectomy
	Supracricoid Laryngectomy	Supraglottic Laryngectomy	
Count	6	5	39
Percentage	12%	10%	78%

**Table 4:** Count & percent of positive nodes on both sides of neck

		Count	%
+ve LNs. (ipsilateral)	yes	24	48%
	no	26	52%
+ve LNs.(Contralateral)	yes	8	16%
	no	42	84%

**Table 5:** Relation between ipsilateral & contralateral neck dissections

+ve LNs. (ipsilateral)		Yes		no	
		Count	%	Count	%
+ve LNs. (Contrlateral)	yes	6	25%	2	7.7%
	no	18	75%	24	92.3%



**Figure 1:** Distribution of the lymph nodes (positive & negative) among the cases, on both sides according to the level