Al-Azhar Med. J . (E N T). *Vol. 51(2), April, 2022, 1234 – 1248*
DOI: 10.21608/amj.2022.230485
https://amj.journals.ekb.eg/article_230485.html

ROLE OF IDENTIFICATION AND STIMULATION OF RECURRENT LARYNGEAL NERVE IN THYROID SURGERY

By

Bahaa El-Deen El-Sayed Mohamad Abo-Zaid, Mostafa Shams El-Deen Khafagi, Mohamad Mahmoud El-Sawy and Ayman Yehia Abbas

Department of Otorhinolaryngology, Faculty of Medicine, Al-Azhar University

Corresponding author: Bahaa El-Deen El-Sayed Mohamad Abo-Zaid,

E-mail: drbahaa1986@gmail.com

ABSTRACT

Background: Thyroid surgery was associated with high mortality rates in the early nineteenth century. Recurrent laryngeal nerve injury (RLNI) is a disabling complication of thyroid surgery. Because of the close anatomical relation between thyroid gland and laryngeal nerves, impairment of laryngeal function is a well-known possible complication of thyroid surgery.

Objective: To assess the routine identification and stimulation of the recurrent laryngeal nerve (RLN) during thyroid operation, and to assess the risk of recurrent laryngeal nerve injury after the operation.

Patients and methods: A prospective study was carried out on cases of thyroid swelling undergoing total thyroidectomy in the Otorhinolaryngology and General Surgery Departments, Al-Azhar University Hospitals. This study included 50 cases: 27 females (54%) and 23 males (46%) ranging in age from 18 to 62 years with a mean of 34.6 years. We did identification of RLN in all cases in both sides with use of intra operative nerve monitoring.

Results: There were statistically significant differences between the right and left lobes in the relation between recurrent laryngeal nerve (RLN) and inferior thyroid artery (ITA). In the right lobe, 58.0% of the patients had the RLN placed in between ITA branches, 28.0 % had the RLN posterior to ITA branches, and 14.0 % had the RLN anterior to ITA branched. On the other hand, in the left lobe, 64.0% of the patients had the RLN placed posterior to the ITA, 20% had the RLN placed in between branches of the ITA and 16.0 % had the RLN anterior to the ITA. No statistically significant difference between the right and left lobe in postoperative vocal cord paresis. 2.0% of the studied patients had hoarseness of voice in early postoperative. This percentage disappeared after 48 hours with IV steroid therapy. Only 4.0% of the studied patients had hypocalcemia in early postoperative. This percentage decreased with time till it disappeared after three months. Only one patient had a surgical site infection (5 days after the operation). After histopathology, 88.0% of the studied patients had multinodular goiter, 10.0% had a colloid goiter, and only 2.0% had papillary thyroid carcinoma.

Conclusion: Proper assessment of vocal cord functions by indirect and direct laryngoscopy, pre-and post-operatively, is necessary to rule out injuries to these nerves during surgery. Current practice used anatomical dissection to identify and preserve the RLN during thyroid surgery, but nerve stimulation has been suggested as a more effective alternative.

Keywords: Recurrent laryngeal nerve, Thyroid surgery.

INTRODUCTION

Laryngeal nerve injury (RLNI) can lead to temporary or permanent paralysis. Mechanism of injury to the nerve includes complete or partial dissection, traction, contusion, crushing injury, thermal damage, misplaced ligature or compromised blood supply. Anything that increases local scar formation, e.g. thyroiditis, previous surgery and radiation, increases the chances of RLN injury *(Myssiorek, 2012).*

The consequence of RLN injury is the true vocal fold paresis or paralysis with varying degrees of symptoms and signs depending upon the severity and side of involvement. Unilateral RLN injury causes the ipsilateral vocal cord to remain in the median or paramedian position. The voice may be hoarse. The patient's cough is weak, and aspiration may occur. Presentation is often sub-acute. Definite voice changes may not manifest for days or weeks. The paralyzed vocal fold undergoes atrophy, causing voice to worsen. Dysphagia and aspiration are other potential sequelae of unilateral vocal fold paralysis *(Sinagra et al., 2012).*

Bilateral RLN paralysis may manifest immediately after extubation and patient exhibit signs of airway obstruction in the immediate postoperative period. Bilateral RLN injury is a severe, life threatening complication that results in airway obstruction and aspiration and requires immediate attention. In this condition, both vocal cords remain in a median or paramedian position. As a result, the patient exhibits inspiratory stridor, dyspnoea, tachypnoea, and nasal flaring, although the voice is near normal *(Schulte and Roher, 2010).*

RLN injury is a major concern in thyroid and parathyroid surgery. Therefore, methods that can reduce the incidence of this complication are of great interest. Careful identification and meticulous thyroid dissection is essential to prevent RLN injury. Some surgeons are of the opinion that it is not possible to identify the recurrent laryngeal nerve in every case. In these circumstances, technique of staying close to the thyroid capsule and division of terminal branches at capsular level is recommended *(Chiang et al., 2010).*

Current practice uses anatomical dissection to identify and preserve the RLN during thyroid surgery, but nerve stimulation has been suggested as a more effective alternative *(Loch-Wilkinson et al., 2010).*

Routine exposure of RLN throughout its course has been shown to reduce the rate of nerve injury. By adopting this principle, nerve injury rate of zero has been reported in the literature even after total thyroidectomy for thyroid cancer. Conversely, when nerve is not clearly identified, the reported injury rate is three to four times higher *(Dionigi et al., 2012).*

Proper assessment of vocal cord functions by indirect and direct laryngoscopy, pre and post operatively, is necessary to rule out injuries to these nerves during surgery *(Mohil et al., 2011).*

Discontinuous nerve stimulation in conjunction with digital palpation involves stimulating the RLN at its proximal exposed site. The surgeon then determines nerve function by inserting a finger into the postcricoid region of the larynx to feel for contraction of the posterior cricoartenoid (PCA) muscle in

response to RLN stimulation. Anatomical dissection for the identification of the RLN is the current standard of care for preserving nerve integrity during thyroid surgery, and is the main comparator for discontinuous nerve stimulation with palpation for RLN identification *(Loch-Wilkinson et al., 2010).*

The aim of this study was to assess the routine identification and stimulation of the recurrent laryngeal nerve (RLN) during thyroid operation, and to assess the risk of recurrent laryngeal nerve injury after the operation.

PATIENTS AND METHODS

A prospective study was carried out on cases of thyroid swelling undergoing total thyroidectomy in the Otorhinolaryngology and General Surgery Departments, Al-Azhar University Hospitals. This study included 50 cases: 27 females (54%) and 23 males (46%) ranging in age from 18 to 62 years with a mean of 34.6 years. We did identification of RLN in all cases in both sides with use of intra operative nerve monitoring.

The study was approved by medical ethical committee. All patients were informed and a written consent was obtained from every patient.

Inclusion criteria: History of swelling in the neck despite appropriate medical therapy (antibiotic and anti-inflammatory), palpable and/or visible enlargement of the thyroid gland at the base of the neck, and thyroid enlargement with solid, cystic or mixed cystic and solid swelling on neck U/S 4 weeks after medical therapy without intervening acute infection.

Exclusion criteria: History of neck trauma, history of previous neck surgery, acute upper respiratory tract infections, patients with unilateral thyroid enlargement such as solitary thyroid nodule, patients with underlying systemic disease such as immune deficiency, patients with chronic specific inflammatory disease such as T.B and syphilis, patients with previous neck irradiation, history of bleeding disorders, and patients with abnormal thyroid function tests. Patients with abnormal thyroid function were treated well before the surgery till euthyroid state was achieved.

Every patient in this study had been submitted for:

A. Full history taking: Personal history, main complaint, history of present illness and past history.

B. General examination: Vital signs, body built, decubitus, mental function, chest and heart examination.

C. Full neck examination: Thyroid examination, lymph node palpation

D. Investigations: Routine preoperative laboratory investigations, thyroid U/S, CT scan of the neck and videostroboscopy.

Operative procedure: All surgeries were done by conventional technique of a capsular dissection of a thyroid lobe, which extended to a total thyroidectomy.

Following surgery, patients were followed at outpatient clinic for evaluation 3 months after surgery, i.e. after complete healing. The outcome of surgery was evaluated subjectively and objectively:

1. **Subjective evaluation:** Symptoms were assessed concerning the degree of improvement (cured, improved, unchanged or worsened). The outcome was classified as cured if there was no more symptoms, and as improved if symptoms of the disease become better after surgery. When the symptoms remained the same, the outcome was classified as unchanged. It was classified as worsened when the symptoms become more than before surgery.
2. **Objective evaluation:** It was done by fibro-optic laryngoscopic examination. It was done to inspect the vocal cords mobility, and post-operative blood calcium level also estimated.

The measures used to decrease risks were complete antiseptic technique with prophylactic postoperative antibiotics. Postoperative asymptomatic hypocalcaemia was treated by supplemental Ca (one to two grams of elemental oral calcium were supplied each day).

Statistical analysis:

Statistical analysis was done using SPSS software version 27 (IBM, 2020). Data were presented in tables and figures. Quantitative variables were presented as mean, median, standard deviation, range and median. Qualitative variables were presented as frequencies and proportions. Pearson's chi-squared test and fisher's exact test were used to analyze qualitative independent variables as appropriate. A P-value of <0.05 was accepted as statistically significant.

RESULTS

This study was conducted on 50 patients: 27 females (54 %) and 23 males (46 %) ranging from 18 to 62 years with a mean of 34.6 years with thyroid swelling undergoing total thyroidectomy. We did identification of RLN in all cases in both sides with additional use of intra operative nerve monitoring.

The clinical presenting symptoms in the studied patients were 34 patients (68.0%) had neck disfigurement, 12 patients (24.0%) had mild swallowing difficulty, 1 patient (2%) had marked swallowing difficulty, 2 patients (4 %) had hoarseness of voice, and 1 patient (2%) had protrusion of the eyes **(Table 1)**.

Table (1): Age and sex distribution and clinical presenting symptoms of the studied patients

Variables	**Study patients (n=50)**	
Age (years): Mean ± SD Range	34.6 ± 11.8 18.0 – 62.0	
	No.	**%**
Sex: Males Females	 23 27	 46.0 54.0
Clinical presenting symptoms: Neck swelling Neck disfigurement Mild difficulty of swallowing Marked difficulty of swallowing Hoarseness of voice Protrusion of the eyes	 50 34 12 1 2 1	 100 68.0 24.0 2.0 4.0 2.0

There was a statistically significant difference between right and left thyroid lobes in morphology. The right lobe had more solid enlargement, and the left lobe had more mixed enlargement. There was no statistically significant difference regarding the size of the right and left lobes. Most of the patients (94.0%) had normal vascularity of the thyroid gland. The studied patients (98.0%) had no retrosternal extension of thyroid swelling. Only one patient had a retrosternal extension. All of the studied patients had freely mobile both vocal cords before the operation. 86.0% of the studied patients had normal thyroid functions, 10.0 had hypothyroidism, and only 4.0% had hyperthyroidism. The mean pre-operative serum calcium level in the studied patients was 9.3 mg/dl. All patients had normal serum calcium before the operation **(Table 2)**.

Table (2): Pre-operative neck ultrasonography, CT, fiber-optic laryngoscopic, thyroid function tests and serum calcium level findings in the studied patients

Side / Ultrasonography	Right lobe		Left lobe		P
	No.	%	No.	%	
Morphology:					
• Solid	40	80.0	20	40.0	
• Cystic	3	6.0	7	14.0	**<0.001**
• Mixed	7	14.0	23	46.0	
Size:					
• ≤ 7 cm	11	22.0	19	38.0	0.081
• > 7 cm	39	78.0	31	62.0	
Vascularity:					
• Normal vascularity	47	94.0	47	94.0	**<0.05**
• Hypervascularity	3	6.0	3	6.0	
	No.		**%**		
CT:					
• Retrosternal extension	1		2.0		**>0. 05**
• No retrosternal extension	49		98.0		
Fiber-optic laryngoscopic:					
• Freely mobile, both vocal cords.	20		100		**>0. 05**
Thyroid function tests:					
• Euthyroid	43		86.0		
• Hypothyroid	5		10.0		**>0. 05**
• Hyperthyroid	2		4.0		
Pre-operative serum calcium (mg /dl):					
Mean ± SD	9.3 ± 2.4				
Median	9.3				
Range	9.1 – 10.1				

There were statistically significant differences between the right and left lobes in the relation between recurrent laryngeal nerve (RLN) and inferior thyroid artery (ITA). In the right lobe, 58.0% of the patients had the RLN placed in between ITA branches, 28.0 % had the RLN posterior to ITA branches, and 14.0 % had the RLN anterior to ITA branched. On the other hand, in the left lobe, 64.0% of the patients had the RLN placed posterior to the ITA, 20% had the RLN placed in between branches of the ITA and 16.0 % had the RLN anterior to the ITA. This table shows no statistically significant difference between the right and left lobe in postoperative vocal cord paresis **(Table 3)**.

Table (3): Intraoperative relation between recurrent laryngeal nerve (RLN) and inferior thyroid artery (ITA) and postoperative vocal cord paresis in the studied patients.

Variables \ Side	Right lobe		Left lobe		P
	No.	%	No.	%	
The RLN was placed in **between** branches of the ITA	29	58.0	10	20.0	**<0.001**
The RLN was placed **posterior** to the ITA	14	28.0	32	64.0	**<0.001**
The RLN was placed **anterior** to the ITA	7	14.0	8	16.0	0.779
Postoperative vocal cord paresis:					
Early postoperative: -Yes -No	 1 49	 2.0 98.0	 0 50	 0.0 100	0.315
After 48 hours with IV steroid therapy: -Yes -No	 0 50	 0.0 100	 0 50	 0.0 100	 **>0. 05**

There was 2.0% of the studied patients had hoarseness of voice in early postoperative. This percentage disappeared after 48 hours with IV steroid therapy. Only 4.0% of the studied patients had hypocalcemiain early postoperative. This percentage decreased with time till it disappeared after three months **(Table 4)**.

Table (4): Postoperative hoarseness of voice and serum calcium level in the studied patients

Hoarseness of voice	Yes		No		P
	No.	%	No.	%	
Early postoperative	1	2.0	49	98.0	0.315
After 48 hours with IV steroid therapy	0	0.0	50	100	
Calcium level	**Hypocalcemia**		**Normal**		
	No.	**%**	**No.**	**%**	
Early postoperative	2	4.0	48	96.0	0.360
After drainage removal (third post-operative day)	1	2.0	49	98.0	
After 3 months	0	0.0	50	100	

Only one patient had a surgical site infection (5 days after the operation). After histopathology, 88.0% of the studied patients had multinodular goiter, 10.0% had a colloid goiter, and only 2.0% had papillary thyroid carcinoma **(Table 5)**.

Table (5): Surgical site infection (5 days after the operation) and histopathology results in the studied patients

Variables	Study patients (n=50)	
	No.	%
Surgical site infection:		
• Yes	1	2.0
• No	49	98.0
Histopathology results:		
• Multinodular goiter	44	88.0
• Colloid goiter	5	10.0
• Papillarythyroid carcinoma	1	2.0

DISCUSSION

This study was conducted on 50 patients, 27 females (54 %) and 23 males (46 %) ranging in age from 18 to 62 years with a mean of 34.6 years with thyroid swelling undergoing total thyroidectomy. We did identification of RLN in all cases in both sides with additional use of intra operative nerve monitoring.

The studied patients' mean age was 34.6 years old, and 54.0% were females and 46 % were males. The clinical presenting symptoms in the studied patients as all the studied patients had neck swelling, 68% had neck disfigurement, 24% had mild swallowing difficulty, 2% had marked swallowing difficulty, 4 % had hoarseness of voice, and 2% had protrusion of the eyes.

Loch-Wilkinson et al. (2010) conducted the non-randomised comparative study of the outcomes of total thyroidectomy using discontinuous nerve stimulation with palpation and total thyroidectomy using anatomical dissection. Both the study and control groups were comparable in terms of mean age, gender ratio and pathological makeup. A twitch response (felt by palpation technique) confirmed the nerves location and functionality. The vocal cords and voice of both patient groups were assessed before and after surgery by an independent ear, nose and throat surgeon, and patients completed dysphagia score sheets (scores ranged from 0 = ‘no symptoms’ to 10 = ‘real difficulty swallowing’).

In the study done by *Loch-Wilkinson et al. (2010),* there were no instances of equipment malfunction. The adverse effects associated with the technique included nerve palsy, severe dysphagia and dysphonia. Postoperatively, complete unilateral temporary RLN palsy (predicted intraoperatively) occurred once and there were two cases of mild dysphonia (not predicted) reported. All three patients recovered completely within a short period; the latter two were not considered to be true RLN injuries. The study group displayed no bilateral nerve palsies or permanent vocal cord paralysis. Dysphagia scores were completed by 82% of patients in the stimulation group and 100% in the control group. The average scores were 3.6 (95% confidence interval (CI), 2.99 to 4.20) and 3.4 (95% CI, 2.52 to 4.28), respectively. Therefore, there was no significant difference in rates of dysphagia between the two groups. Other postoperative complications in the study group included four patients with temporary hypocalcemia and one with hematoma. In the control group, two patients reported temporary hypocalcemia and one required reoperation due to hemorrhage.

Positive and negative likelihood ratios (LRs) were reported where possible. A positive LR is the ratio of the true-positive rate to the false-positive rate (sensitivity/ (1 - specificity)). A negative LR is the ratio of the false-negative rate to the true-negative rate ((1 - sensitivity)/specificity). A LR > 1 indicates a higher likelihood of having the condition, whereas LRs < 1 indicate a higher likelihood that the condition is absent. LRs above 10 and below 0.1 indicate that the test has a strong ability to detect the presence or absence of the condition, respectively *(Deeks andAltman, 2011).*

In our study, there were high statistically significant differences

between the right and left lobes in the relation between recurrent laryngeal nerve (RLN) and inferior thyroid artery (ITA). In the right lobe, 58.0% of the patients had the RLN placed in between ITA branches, 28.0 % had the RLN posterior to ITA branches, and 14.0 % had the RLN anterior to ITA branched. On the other hand, in the left lobe, 64.0% of the patients had the RLN placed posterior to the ITA, 20% had the RLN placed in between branches of the ITA and 16.0 % had the RLN anterior to the ITA. There was no statistically significant difference between the right and left lobe in postoperative vocal cord paresis.

In the study done by *Loch-Wilkinson et al. (2010)*, there were 100 RLNs and 100 external branch of superior laryngeal nerve (EBSLN) s at risk for investigation. Intraoperative, 100% of the RLNs and 86% of the EBSLNs were identified without the need for nerve stimulation. A negative twitch result occurred in 7% of RLNs (2 bilaterally and 3 unilaterally). Postoperative assessment found only 1 RLN palsy, thus 6 false-positives and 1 true-positive were found by nerve stimulation. 30% EBSLNs could not be identified by dissection, and only one was then found with nerve stimulation. Thus, a total of 12 nerves were not found by either method. A negative twitch response occurred in 14% of EBSLNs (8 unilaterally and 3 bilaterally; n=11 patients). Of the 8 unilateral negative twitches, there were 2 negative twitches for the RLN in the same patient. These false-positives may have been due to the residual effect of the neuromuscular blocking agents or a secondary effect of the reversal agent. Overall, the sensitivity and specificity of RLN stimulation was 100% and 94%, with a positive predictive value (PPV) of 14% and negative predictive value (NPV) of 100%. The positive and negative LRs were 16.7 and 0, which indicate that discontinuous nerve stimulation provides definitive diagnostic evidence.

In our study, there was 2.0% of the studied patients had hoarseness of voice in early postoperative. This percentage disappeared after 48 hours with IV steroid therapy. Only 4.0% of the studied patients had hypocalcemia in early postoperative. This percentage decreased with time till it disappeared after three months. In our study only one patient had a surgical site infection (5 days after the operation). After histopathology, 88.0% of the studied patients had multinodular goiter, 10.0% had a colloid goiter, and only 2.0% had papillary thyroid carcinoma.

Tomoda et al. (2011) conducted a prospective case series study included patients with malignant or benign tumors, as well as those undergoing primary or secondary thyroid surgery. Complete RLN identification and dissection was carried out in all patients followed by neural stimulation (1.0 m Amp) at the end of each surgery. Palpation for contraction of the PCA muscle was performed to confirm the location and function of the RLN.

In the study done by *Tomoda et al. (2011)*, the overall, 3.6% nerves at risk experienced temporary palsy and 1% experienced permanent palsy. Temporary and permanent RLN palsy was more common in patients with cancer and those undergoing a secondary thyroid surgery. Eleven patients with RLN palsy reported no symptoms. Recovery time for

temporary palsy ranged from seven days to 12 months, with 92.1% of patients recovered fully within six months. Thirty patients experienced hoarseness (from one or more causes) but did not have RLN palsy. The cause was attributed to hematoma, oedema with vocal cord and/or arytenoid involvement, acute laryngitis, chronic laryngitis or vocal cord polyps. Eight patients had no identifiable cause for their hoarseness.

In *Tomoda et al. (2011),* there were 76 negative RLN twitch results, 70 of which were true-positives for RLN palsy. Of these true-positive results, 25.7% of nerves experienced permanent palsy. There were 90% of RLN palsies resolved within a year. For identifying immediate (temporary) postoperative vocal cord palsy, the sensitivity and specificity of nerve stimulation was 69.3% and 99.7%, with a PPV of 92.1% and a NPV of 98.5%. For permanent vocal cord palsy, the sensitivity and specificity of nerve stimulation was 85.7% and 97.3%, with a PPV of 23.7% and a NPV of 99.8%. The positive and negative LRs for temporary RLN palsy were 231 and 0.31, which indicate that in this case nerve stimulation provides moderate to strong diagnostic evidence as it is very good at detecting a positive result (ruling in nerve palsy) rather than ruling it out. The positive and negative LRs for permanent RLN palsy were 31.7 and 0.15, which indicate that nerve stimulation provides strong diagnostic evidence as its ability to detect both positive and negative results was high.

Otto et al. (2010) conducted a prospective case series study of 55 patients (81 nerves at risk) who underwent thyroid or parathyroid surgery. Each patient underwent pre- and postoperative assessment by an otolaryngology resident proficient in laryngeal examination to evaluate vocal cord mobility. During surgery all RLNs at risk were identified and exposed. At the conclusion of each surgery the RLNs were stimulated using 0.5 mAmp to confirm their integrity. A second 0.5 mAmp stimulus was applied if the first attempt was unsuccessful. Digital palpation was used to detect contraction of the PCA muscle during stimulation. Results were recorded as ‘positive’ (no contraction) or ‘negative’ (palpable contraction).

Little safety data were reported by *Otto et al. (2010),* four patients incurred damage to their RLN, which resolved in three cases by the time of the postoperative examination (follow-up time not specified). The remaining patient did not attend a follow-up appointment but reported no adverse outcomes from surgery. There were a total of 72 palpable contractions (positives) and 9 non-contractions (negatives). Of these, six were false-positives and one was a false-negative. The sensitivity and specificity of intraoperative RLN stimulation for predicting laryngeal damage after thyroid surgery was 75% and 92.2%, respectively. The PPV and NPV were 33.3% and 98.6%. The positive and negative LRs were 9.62 and 0.27, which indicate that nerve stimulation provides moderate to strong diagnostic evidence.

CONCLUSION

Proper assessment of vocal cord functions by indirect and direct laryngoscopy, pre and post operatively, is necessary to rule out injuries to these

nerves during surgery. Current practice uses anatomical dissection to identify and preserve the RLN during thyroid surgery, but nerve stimulation has been suggested as a more effective alternative.

REFERENCES

1. **Chiang FY, Lee KW and Chen HC. (2010):** Standardization of intraoperative neuromonitoring of recurrent laryngeal nerve in thyroid operation. World J Surg., 34:223–9.
2. **Deeks JJ and Altman DG. (2011):** Diagnostic tests 4: likelihood ratios. BMJ, 329 (7458): 168-9.
3. **Dionigi G, Alesina PF, Barczynski M, Boni L, Chiang FY and Kim HY. (2012):** Recurrent laryngeal nerve injury in video-assisted thyroidectomy: lessons learned from neuromonitoring. Surg Endosc., 26:2601-8.
4. **Loch-Wilkinson TJ, Stalberg PL, Sibhu SB, Sywak MS, Wilkinson JF and Delbridge DW. (2011):** Nerve stimulation in thyroid surgery: is it really useful? ANZ Journal of Surgery, 77(5): 377-380.
5. **Mohil RS, Desai P, Narayan N, Sahoo M, Bhatnagar D and Venkatachalam VP. (2011):** Recurrent laryngeal nerve and voice preservation: routine identification and appropriate assessment - two important steps in thyroid surgery. Ann R Coll Surg Engl., 93:49-53.
6. **Myssiorek D. (2012):** Recurrent Laryngeal nerve paralysis: anatomy and etiology. Otolaryngol Clin N Am., 37:25-44.
7. **Otto RA and Cochran CS. (2010):** Sensitivity and specificity of intraoperative recurrent laryngeal nerve stimulation in predicting postoperative nerve paralysis. Annals of Otology, Rhinology and Laryngology, 111(11): 1005-7.
8. **Schulte KM and Roher HD. (2010):** Complications in the surgery of benign thyroid disease. Acta Chir Austriaca., 33:164-72.
9. **Sinagra DL, Montesinos MR, Tacchi VA, Moreno JC, Falco JE and Mezzadri NA. (2012):** Voice changes after thyroidectomy without recurrent laryngeal nerve injury. J Am Coll Surg., 199:556-60.
10. **Tomoda C, Hirokawa Y, Uruno T, Takamura Y, Ito Y, Miya A, Koboyashi K, Matsuzuka F, Kuma K and Miyauchi A. (2011):** Sensitivity and specificity of intraoperative recurrent laryngeal nerve stimulation test for predicting vocal cord palsy after thyroid surgery. World Journal of Surgery, 30(7): 1230-3.

دور التعرف والتنبيه على العصب الحنجرى الراجع فى جراحة الغدة الدرقية

بهاء الدين السيد محمد أبوزيد، مصطفى شمس الدين خفاجى، محمد محمود الصاوى، أيمن يحيى عباس

قسم الأذن والأنف والحنجرة، كلية الطب، جامعة الأزهر

E-mail: drbahaa1986@gmail.com

خلفية البحث: تعتبر أورام والتهابات الغدة الدرقية شائعة للغاية .ويُعد شلل العصب الحنجري الراجع من المضاعفات المهمة والكارثية المحتملة لجراحة الغدة الدرقية ويمكن أن يتسبب تلف العصب الحنجري الراجع الى شلل بالأحبال الصوتية وظهور أعراض تتراوح بين بحة في الصوت لا يمكن إكتشافها تقريبًا إلى انسداد مجرى الهواء الحاد.

الهدف من البحث: تقييم دورالتعرف والتنبيه على العصب الحنجري الراجع أثناء عملية الغدة الدرقية وتقييم مخاطر إصابة العصب الحنجري الراجع بعد العملية وكيفية التعامل مع هذه المشكلة.

المرضى وطرق البحث: تم إجراء دراسة استطلاعية على 50 حالة من حالات تورم الغدة الدرقية الخاضعة لاستئصال الغدة الدرقية الكلي في قسم طب الأنف والأذن والحنجرة والجراحة العامة بمستشفيات جامعة الأزهر. شملت هذه الدراسة 27 أنثى (54٪) و 23 ذكراً (46٪) تتراوح أعمارهم بين 18 إلى 62 سنة بمتوسط 34.6سنة. لقدحددنا العصب الحنجري الراجع في جميع الحالات في كلا الجانبين باستخدام مراقبة العصب داخل المنطوق.

نتائج البحث: كان لدى جميع المرضى تورم في الرقبة ، وكان 34 مريضًا (68٪) يعانون من تشوه في الرقبة ، و 12 مريضًا (24٪) يعانون من صعوبة خفيفة في البلع، و 1 مريض (2٪) يعاني من صعوبة ملحوظة في البلع، و 2 مريض (4٪) يعاني من بحة في الصوت. من الصوت، ومريض واحد (2٪) كان لديه جحوظ في العينين، وقد تم عمل تصوير حنجرى لجميع المرضى قبل العمليةالجراحية، وكان جميع المرضى الذين خضعوا للدراسة يتمتعون بحرية

حركة الأحبال الصوتية قبل العملية، كما أظهرت الأشعة المقطعية للرقبة قبل الجراحة أن معظم المرضى الخاضعين للدراسة (98٪) لم يكن لديهم امتداد لتورم الغدة الدرقية خلف عظمة القص، في حين أن مريضاً واحداً فقط (2٪) كان لديه إمتداد خلف عظمة القص وأظهرت الدراسة أن 2 ٪ من المرضى الخاضعين للدراسة يعانون من بحة في الصوت في فترة ما بعد الجراحة المبكرة. وإنخفضت هذه النسبة إلى 0٪ بعد 48 ساعة. وقد حدث شلل جزئي مؤقت للحبل الصوتي بعد الجراحة في حالة واحدة فقط على الجانب الأيمن مع تحسن واضح بعد 48 ساعة مع إعطاء الكورتيزون الوريدي.

الاستنتاج: التقييم الصحيح لوظائف الأحبال الصوتية عن طريق تنظير الحنجرة غير المباشر والمباشر قبل الجراحة وبعدها ضروري لاستبعاد إصابات هذه الأعصاب أثناء الجراحة، وتستخدم الممارسة الحالية التشريحية لتحديد والحفاظ على العصب الحنجري الراجع أثناء جراحة الغدة الدرقية، ولكن تم إقتراح تحفيز الأعصاب كبديل أكثر فعالية.

الكلمات الدالة: العصب الحنجري الراجع، جراحة الغدة الدرقية.