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Study of Incidence, Risk Factors and Natural Outcome of Vocal Cord Paresis in Thyroid Operations

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Abstract: ***Vocal fold (VFP) paresis caused by recurrent laryngeal nerve (RLN) injury is a well known complication of thyroid surgery and it has been widely documented in the literature. The rates of transient VFP ranged from 1.4 to 38.4% (mean 9.8%) and from zero to 18.6% (mean 2.3%)for permanent VFP. The incidence of VFP may be underestimated unless routine vocal fold evaluation is performed. Postoperative RLN injury is considered permanent if complete vocal fold immobility or dysfunction lasts more than 1 year. Permanent injuries have been documented in up to 1.4% and transient injuries in 5.2 to 12.6% of the patients according to studies which utilized routine post operative vocal fold examination. The reported risk factors for intra operative RLN injury include patients older age, intra thoracic goiter, thyrotoxicosis, thyroid malignancy, previous thyroidectomy, reoperation for bleeding, extended surgery, low or medium volume hospital, and low volume surgeons***

1. Materials and Methods

Study Patients

This was an observational single-institution study based on prospectively collected data.

- All consecutive patients who underwent primary or redo thyroid surgery between july 2018 to june 2019 were prospectively registered.
- All patients underwent clinical examination, thyroid ultrasound, and fine – needle aspiration (FNA) biopsy when appropriate.
- The indications for surgery were registered as primary goiter, recurrent goiter (previous thyroid surgery), suspicious thyroid nodule, malignant thyroid nodule, completion thyroidectomy, hyperthyroidism, or other indication.
- "Suspicious thyroid nodule" was defined as follicular neoplasm or clinical suspicion for malignancy (based on size, appearance, or growth rate in ultrasound imaging) when the FNA biopsy was inconclusive.

Vocal Fold Evaluation and Follow-Up

All patients underwent independent evaluation of vocal fold function by otolaryngologists who were not involved in the surgical procedure.

2. Results

During the 1 year study period, 180 thyroid surgeries were done in 172 patients with 238 nerves at risk.

Table 1: Patients, operations, and pre- and postoperative laryngoscopic findings

Patients	172
Mean age ± SD	55 ± 16 years
Male	8 (4.7%)
Mean age ± SD	57 ± 16 years
Female	164 (82.3%)
Mean age ± SD	55 ± 16 years
Thyroid operations	180
Total thyroidectomies	58
Partial/ hemithyroidectomies	122
Nerves at risk	238
Right RLN	68
Left RLN	54
Both RLNs	116
Undefined 0	
Preoperative laryngoscopy	180
Normal	175
Unilateral VFP	5
Bilateral VFP	0
Postoperative laryngoscopy	180
Normal	166
Unilateral VFP	14
Bilateral VFP	0
New VFP	9/180
New unilateral VFP	9
New bilateral VFP	0
Transient new VFP	5 with complete recovery, 3 with near-complete recovery
Permanent new VFP	1 definitive

Table 2: The rates of malignant histology at postoperative pathology examination, and the rates of new postoperative vocal fold pareses (VFPs), stratified by the indication for surgery

Indication for surgery	No. of cases	Mean age ± SD (year)	Female sex	Malignant histology	New VFP at discharge	Permanent VFP at 12- months
Primary goiter	75	58±14	75	8	0	0
Recurrent goiter	7	64±13	7	0	2	0
Suspicious thyroid nodule	53	54±16	50	13	0	0
Malignant thyroid nodule	8	52±19	4	8	5	1
Completion thyroidectomy	8	54±16	8	2	1	0
Hyperthyroidism	25	43±15	24	1	1	0
Thyroiditis	5	48±15	5	0	0	0
Total (per operations	180	55±16	172	32	9	1

3. Discussion

Although well known and widely reported in the literature, the incidence of VFP before and after thyroid surgery is exceptionally varying. According to our results, the incidence of new VFP was 9 in 180 (5%) operations. Compared to the results of previous studies in which routine laryngoscopy was used, our complication rate was lower (5% against 7.6 -13.9%).

In our study only one patient had permanent vocal fold paresis (11%) in comparison with approximately 50%- 55% in other studies. These remarkable differences need to be analyzed focusing on patients characteristics, diagnoses, extent of surgical procedures, reporting standards, and hospital and surgeon volume.

The routine visualization of RLN is regarded as a gold standard for nerve injury prevention.

Interestingly, we found no difference in VFP rates in cases where RLN was visualized compared to cases where RLN was not seen. The effect of energy devices in RLN injury rate could not be assessed because there were not enough cases for control group. Only a few patients were operated without using any vessel sealing devices.

Routine postoperative laryngoscopy enables early diagnosis and thus initiation of voice therapy without delay, which is also important in the prevention of aspiration related problems. Furthermore, routine vocal fold screening gives direct feedback to the surgeon and may help avoid RLN injuries in the future.

Table 3: Univariate analysis of independent risk factors associated with new vocal fold paresis (VFP) at discharge

Risk factor	VFPs/cases with risk factor (%)	VFPs/cases with risk factor (%)	P	Odds ratio	95% confidence interval
Preoperative risk factors					
Recurrent goiter	2/7	7/173	0.0146	9.4	1.562 to57.7
Malignant thyroid nodule	5/8	4/174	<0.0001	9.3	14.9 to 582.3
Perioperative risk factors					
Total thyroidectomy	9/58	0/122	0.0084	47.02	2.67 to823.4
Use of energy device	9/180	_	_	_	_
Nerve at risk identified	8/150	1/30	0.65	1.633	0.196 to 13.57
Lymph node dissection	3/10	6/170	0.0023	11.71	2.41 to 56.8
Drain	5/70	4/10	0.3013	2.0385	0.528 to 7.86
Intraoperative bleeding	1/1	8/179	0.0140	60.529	2.29 to 1598.88
Additional parathyroid procedure	_	_	_	_	_
Postoperative risk associations					
Hemorrhage requiring reoperation	_	_	_	_	_
Hypocalcemia	4/20	5/160	0.0045	7.75	1.89 to 31.8
Surgical wound infection	_	_	_	_	_
Malignant histology	6/32	3/148	0.0011	11.153	2.62 to 47.4
Metastatic versus local disease	1/6	5/26	0.8848	0.8400	0.08 to 8.8

Table 4: Multivariate analysis of risk factors associated with new vocal fold paresis

Risk factor	P	Odds ratio	95% confidence interval
Total thyroidectomy	0.004	2.39	1.32–4.31
Recurrent goiter	<0.001	8.82	3.71–21
Drain	0.030	2.56	1.10–5.99
Malignant histology	0.001	3.01	1.60–5.66

4. Conclusions

This study highlights the significance of routine screening of VFP in thyroid surgery.

Almost 3% of patients had incidental VFP preoperatively' which can only be verified with routinely performed preoperative laryngoscopy. The risk of postoperative new-onset VFP was highest among patients with thyroid malignancy.

These patient groups need to be well informed of the increased risk before surgery.

Almost half of VFP resolved completely spontaneously, which was higher rate than previously reported.

References

[1] Jeannon JP, Orabi AA, Bruch GA, Abdalsalam HA, Simo R (2009) Diagnosis of recurrent laryngeal nerve palsy after thyroidectomy: a systematic review. Int J Clin Pract 63:624– 629
[2] Bergenfelz A, Jansson S, Kristoffersson A et al (2008) Complications to thyroid surgery: results as reported in a database from a multicenter audit comprising 3,660 patients. Langenbecks Arch Surg 393:667–673
[3] Stager SV (2014) Vocal fold paresis: etiology, clinical diagnosis and clinical management. Curr Opin Otolaryngol Head Neck Surg 22:444–4494.Lo CY, Kwok KF, Yuen PW (2000) A prospective evaluation of recurrent laryngeal nerve paralysis during thyroidectomy. Arch Surg 135:204–207
[4] Joliat GR, Guarnero V, Demartines N, Schweizer V, Matter M (2017) Recurrent laryngeal nerve injury after thyroid and parathyroid surgery: incidence and postoperative evolution assessment. Medicine (Baltimore) 96:e6674
[5] Dralle H, Sekulla C, Haerting J et al (2004) Risk factors of paralysis and functional outcome after recurrent laryngeal nerve monitoring in thyroid surgery. Surgery 136:1310–1322