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INCIDENCE OF RECURRENT LARYNGEAL NERVE PALSY FOLLOWING THYROID SURGERY AT A TERTIARY CARE HOSPITAL IN NEPAL

Objectives:
To assess the incidence of recurrent laryngeal nerve (RLN) palsy in patients undergoing thyroid surgery

Materials and methods:
Prospective observational study conducted at Shree Birendra Hospital, Chhauni, Kathmandu, Nepal from August 2012 to august 2013.

Results:
A total of 78 thyroid surgery were performed during this study period. Out of those patients, 8 (10.25%) had RLN palsy and were subsequently followed up for six months postoperatively for possible recovery of nerve palsy. Seven patients (8.97%) recovered over 4 week's period whereas one male patient (1.28%) had permanent palsy.

Conclusion:
Our study found that injury to RLN during thyroid surgery is not uncommon, which is more common in total and completion thyroidectomy than in hemithryoidectomy. Most of the cases of iatrogenic RLN injury are temporary and recovers partially or completely with the conservative management.

Key words: Thyroid surgery, Recurrent laryngeal nerve palsy

INTRODUCTION:

Thyroid surgery is one of the commonest neck surgeries performed worldwide. Vocal cord paresis or paralysis due to iatrogenic injury of RLN is one of the main problem after thyroid surgery. Despite many methods to prevent RLN palsy its incidence varies between 1.5-14%.[1] Incidence of RLN palsy has been found to be higher during re-explorations, graves disease and thyroid carcinoma.[2,3] An almost certain way to ensure the integrity of the RLN is to identify the nerve during all surgical procedures on thyroid and parathyroid glands.[4,5] RLN palsy is generally unilateral and transient, recovering within six months, but occasionally it can be bilateral and permanent if continued beyond 6 months.[6,7]

Bilateral RLN Palsy may occur after total thyroidectomy, which is a life threatening condition resulting in stridor, that requires emergency tracheostomy to maintain airway.[8] Different mechanisms have been described for trauma to RLN. Generally RLN Palsy is manifested immediately. However, delayed cases of RLN injury have been documented and the mechanism is different.[9,10] The aim of this study is to assess the incidence of RLN nerve injury among the patients undergoing thyroid surgeries at our institution where thyroid surgery is one of the common surgery performed. We conducted this study with the hope that sharing our experience on incidence and possible causes of iatrogenic RLN palsy following thyroid surgery might be helpful to find a way for lowering incidence of RLN injury in long run.

MATERIALS AND METHODS:

This prospective longitudinal observational study was conducted from august 2012 to august 2013 in the Department of ENT-HNS, Shree Birendra Hospital Chhauni, Kathmandu, Nepal. Informed consent was taken from patients undergoing thyroid surgery. They were counseled about the type of surgery and possible complications with special emphasis on RLN palsy. Type of surgery, either hemi or total thyroidectomy and completion thyroidectomy was decided by the clinical finding, Ultrasound, Fine Needle Aspiration Cytology (FNAC) and imaging when necessary. The management needed in case of RLN palsy was briefed to them in detail. All patients were evaluated by the principle author before and on day four after surgery for vocal cord function by direct laryngoscopy with a flexible endoscope. Data about the patient detail, indication and type of thyroid surgery, final histopathology, status of RLN pre and postoperatively were maintained. Surgery was performed by the same group of surgeons in the department. RLN palsy was defined as either decreased or loss of vocal cord mobility during phonation. Those with vocal cord palsy were managed conservatively with steroid in immediate post operative period bearing in mind that the edema around RLN would subside if present and voice therapy was provided later by the speech and language pathologist once the patient is discharged from the hospital. Follow-up examinations were performed at the time of discharge and at 1, 3 and after 6 months for patients with RLN palsy. RLN palsy that did not resolve within the first 6 months was classified as permanent palsy.

RESULTS:

During the study period 78 patients underwent thyroid surgery in the form of either total or hemithyroidectomy and completion thyroidectomy. The commonest indication for hemithyoidectomy was colloid goiter whereas thyroid carcinoma and multinodular goiter were the common indications for total thyroidectomy. Out of total 78 thyroid surgeries, 8 (10.25%) patients had RLN palsy; 5 were right sided and 3 left sided. Out of eight, Seven patients (8.97%) recovered over 4 weeks period, whereas one male patient (1.28%) had permanent palsy.

Table 1: Showing types of surgery and RLN Palsy.

Surgery performed	Total number of surgery	Total thyroidectomy	Total thyroidectomy with MRND	Hemithyroid ectomy	Completion thyroidectomy
	78	24	4	43	7
No. of cases with RLN Palsy	8	4	-	3	1
% of RLN Palsy	10.25%	16.66%	-	6.97%	14.28%

Table 2: Comparison of the incidence of RLN palsy in various studies

Author	Study type	Total no. of patients undergoing surgery	Different Surgeries performed in numbers (RLN Palsy %)					Overall RLN palsy	Unilateral RLN Palsy		Bilateral RLN Palsy	
			Total Thyroidectomy	Completion Thyroidectomy		Hemithyroidectomy or other			Temporary	Permanent	Temporary	Permanent
				No of surgery	RLN Palsy %	No of surgery	% RLN Palsy					
Dutta H	P	112	19	4	31.5%	65	6.15%	13.39%	8.92%	4.46%		-
Hazem MZ	R	340	14	1				4.08%	3.2%	0.3%	0.58%	-
Jiang Y	R	623	NA	4	10.81%		4.61%	4.98%	4.61%	9.67%	3.22%	-
Chaudhary IA	P	310	26	-	-	NA	-	3.22%	2.58%	0.64%		-
Idris SA	P	82	-	-	-	-	-	1.2%	1.2%	-	-	-
BoraMK	P	142	25	13		86	-	2.11%	7.14%	-	-	-
Our study	P	78	4	1		73	-	10.25%	8.97%	1.28%	-	-

P= Prospective, R= Retrospective

DISCUSSION:

RLN palsy is one of the most frequent and serious complications of thyroid surgery. The importance of preservation of the RLN in thyroid surgery has been known for a long time and ENT surgeons need to have a thorough knowledge of both anatomy and strategies for the management of recurrent laryngeal nerve. Preoperative laryngeal examination is an essential part of the preparation and counseling for patients undergoing thyroid surgery. Our study had only unilateral RLN palsy which is similar to other studies.[13,14,15] Temporary palsy occurs between 2.9-10% and right side RLN injury is more common due to its wider anatomical variation. Permanent palsy occurs between 0-2% with an average 0.5-1.1%.[8] Dutta et al found an incidence of 13.39% RLN palsy (8.92% temporary and 4.46% permanent). Our result is similar to this study. Unlike other studies our study performed either hemi or total thyroidectomy. Routine exposure throughout its course and meticulous dissection is recommended to prevent RLN palsy. Staying close to the thyroid capsule and division of terminal branches at capsular level is recommended to save RLN when its identification is not possible.[16] However it has been stated to be a dangerous practice to dissect the nerve.[17] Total dissection of RLN over its entire cervical course precludes an incorrect alignment which allows surgeon to verify the anatomic integrity of the nerve and to identify extra laryngeal ramifications. This is superior to partial exposure of RLN which have been supported by poor outcome.[16] Visual nerve identification remains the gold standard of RLN management in thyroid surgery.[14,15,18] In our study though we tried identifying the nerves but at times we did not pay much attention to dissect it to the entire course.

In a study by Beahrs et al. the incidence of RLN palsy was 17% in completion thyroidectomies. It is similar to our study which shows 14.28% , which is one out of seven patients having RLN palsy following completion thyroidectomy for papillary thyroid cancer and was permanent.[19] In a study done by Calabro et al, 1.5% of the patients developed RLN palsy after completion thyroidectomy ,which was temporary, and recovered later.[20] Whereas incidence of permanent RLN palsy could be as high as 13%-30% during thyroid cancer and secondary thyroid surgery.[26] In a retrospective study 4.7% RLN palsy was noted in 466 cases of thyroid cancer surgery.[28] In another retrospective study with 623 thyroid surgery, incidence of RLN palsy was 4.9%.[29]

Mechanisms of injury to RLN include partial or complete transaction, traction on handling the nerve, contusion, crush, burn, clamping, misplaced ligature and compromised blood supply.[21,22] Visualization of the RLN is absolutely essential to good surgical outcomes because many authors report decreased incidence of RLN palsy with visualization. Nerve monitoring has important uses as an adjunct to the visual identification of the nerve. For this purpose various devices have been used that detects vocal cord movement when RLN is stimulated thus reducing the risk of RLN palsy.[16] Lo CY et al in a prospective evaluation of 500 patients who underwent thyroid surgery by an experienced endocrinology surgeon and the team noted 6.6% RLN palsy. The study highlights the reported rate of RLN palsy may be underestimated due to a long period of study and surgeons with varied experience performing surgery.[24] Complication after thyroid surgery were often underestimated due to reporting preference.[25] Renz et al noted one third of their patients having minimal hoarseness following thyroid surgery despite presence of unilateral vocal cord palsy. So reported RLN palsy may be under reported without routine vocal cord palsy.[27]

CONCLUSION:

Recurrent laryngeal nerve palsy is more common in total and completion thyroidectomy than in hemithryoidectomy. Despite the fact that the rate of complications is constantly decreasing, iatrogenic injury to the recurrent laryngeal nerve is not uncommon. Careful surgical techniques such as tracing the nerve to its entire course, proper handling to avoid traction, emphasis to preserve its blood supply; and understanding of anatomic variation and surgical experiences might reduce the chances of RLN injury during thyroidectomy.

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