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ORIGINAL ARTICLE

Posterior Commissure Hypertrophy as Diagnostic and Prognostic Indicator for Laryngopharyngeal Reflux

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ABSTRACT

Purpose: To establish posterior commissure hypertrophy as tool to diagnose laryngopharyngeal reflux (LPR) and to determine whether it can be used as a reliable marker for response to treatment.

Materials and methods: A prospective study of 100 patients with voice disorder was conducted. Patients were evaluated using reflux symptom index (RSI) and reflux finding score (RFS) by 70° Hopkins' rigid laryngoscope. Those patients in whom RFS score was 7 or more were diagnosed to have LPR. These patients were then started on antireflux therapy along with lifestyle modification and were evaluated regularly over a period of 6 months.

Results: The prevalence of LPR in patients with voice disorders was found to be 25%. Mean age was 41.48 years and the male and female ratio was 0.85:1. Posterior commissure hypertrophy was present in 60 out of 100 patients (60%). Among laryngopharyngeal reflux disease (LPRD), 23 out of 25 patients (92%) had posterior commissure hypertrophy, out of which only 2 (8.6%) patients showed complete resolution of posterior commissure hypertrophy after 6 months of treatment. A total of 10 patients (43.47%) did not show any change in grading of posterior commissure hypertrophy. And 11 patients (47.82%) showed downgrading of posterior commissure hypertrophy. Sensitivity of posterior commissure hypertrophy for diagnosis of LPR was found to be 92%, whereas specificity was 50.66%.

Conclusion: Posterior commissure hypertrophy can be used as a screening tool for diagnosis of LPR but cannot be used reliably as a clinical marker for response to therapy.

Keywords: Laryngopharyngeal reflux, Posterior commissure hypertrophy, Reflux finding score.

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INTRODUCTION

Laryngopharyngeal reflux (LPR) is the laryngeal manifestation of gastroesophageal reflux. There has been a steep rise in the prevalence of LPR, but still it is one of the most difficult disorders to diagnose because of its vague symptomatology and nonspecific signs.

In an effort to identify laryngoscopic signs more specific for LPR, Belafsky et al[1] developed a validated eight-item clinical severity scale based on laryngeal abnormalities present in the subglottic, posterior commissure and vocal-fold areas, as well as the presence of ventricular obliteration, granuloma or diffuse laryngeal edema. A 'reflux finding score' (RFS) score of greater than 7 was found to suggest GERD associated laryngitis. Further studies by Belafsky et al[2] have demonstrated that treatment of LPR for more than 6 months may be indicated to achieve a complete resolution of physical findings and prevent recurrence. The purpose of this study was to establish posterior commissure hypertrophy as a tool to diagnose LPR and to determine whether posterior commissure hypertrophy can be use as a reliable marker for response to treatment.

AIMS AND OBJECTIVES

- To establish sensitivity and specificity of posterior commissure hypertrophy as an index for LPR.

MATERIALS AND METHODS

In this study, 100 patients of voice disorders who presented to ENT outpatient department from July 2011 to August 2013 were included. Children and adolescents below 18 years of age, cases of paralytic dysphonia, cases of suspected laryngeal malignancies and cases of trauma were excluded. Thorough detailed history including age, gender, occupation, tea/coffee intake (more than 2 cups/day), history of addiction, food habits (like spicy or bland food) and sleep (sleep less than 6 hours) was taken.

Reflux symptom index (RSI) score was calculated for all patients in the study. General and physical examination was done for all patients. All patients were evaluated with 70° Hopkins rigid laryngoscope. Findings were noted and scored according to RFS.

All patients were classified into two groups using RFS; those patients in whom RFS were less than 7 were labeled as 'others', while those patients with RFS 7 or more than

7 were labeled as 'LPR'. Diagnosis of LPR was done on the basis of RFS as validated by Belafsky et al.[1] Patients in LPR group were then started with antireflux therapy in the form of proton pump inhibitor, i.e. omeprazole in the dose of 20 mg BID on empty stomach for a period of 6 months. This treatment was combined with strict dietary modification, stress management and regularization of lifestyle.

The patients of LPR group were then followed up at an interval of 1, 2, 3 and 6 months. Follow-up visit consisted of assessing the RSI, voice handicap index and RFS by 70° rigid laryngoscope.

RESULTS

Out of the 100 patients enrolled with voice disorders, there were 25 patients whose RFS was 7 or more than 7 and 75 patients whose RFS was less than 7.

Demographic studies showed maximum patients were in age group of 25 to 44 years (70%), followed by 45 to 64 years (27%). The mean age was 41.48 years. A total of 54% patients were female and 46% were male.

In this study, patients with the complaint of hoarse voice were enrolled. Throat clearing (76%) and globus sensation (72%) were the other common symptoms in LPR patients. Breathing difficulty was less commonly found in LPR patients (12%) (Table 1).

The 70° rigid laryngoscopy of all 100 patients showed that posterior commissure hypertrophy was present in 60 out of 100 patients (60%) and in those with LPR up to 92% of patients (23 out of 25) had posterior commissure hypertrophy (Table 2).

Comparison of various variables of RFS at the time of presentation and after 6 months of treatment was done. Mean value of grade of pseudosulcus vocalis at presentation was 0.72, which improved to 0.00 after treatment ($p = 0.0027$). Similarly other parameters like ventricular obliteration (2.56 improved to 0.24), erythema/hyperemia (1.36 improved to 0.08), vocal fold edema (0.80 improved to 0.08), and posterior commissure hypertrophy (1.88 improved to 1.12) thick endolaryngeal mucus (0.40 improved to 0.00) showed significant improvement ($p < 0.05$). Mean value of diffuse laryngeal edema at presentation was 0.20, which improved to 0.00 after treatment, but improvement was not statistically significant ($p = 0.58$). In our study, no patient presented with granuloma (Table 3).

Table 1: Symptoms in patients with laryngopharyngeal reflux

Symptoms of LPR	*No. of patients*	*Percentage of patients*
Hoarseness	25	100
Throat clearing	19	76
Post nasal drip	7	28
Dysphagia	8	32
Chronic cough	15	60
Breathing difficulty	3	12
Troublesome cough	8	32
Globus sensation	18	72
Heartburn	10	40

Table 2: Signs in patients with laryngopharyngeal reflux

Symptoms of LPR	*No. of patients*	*Percentage of patients*
Pseudosulcus vocalis	9	36
Ventricular obliteration	21	84
Erythema/hyperemia	16	64
Vocal cord edema	10	40
Diffuse laryngeal edema	4	16
Posterior commissure hypertrophy	23	92
Granuloma	0	0
Thick endolaryngeal mucus	5	20

Table 3: Comparison of various variables of reflux finding score in laryngopharyngeal reflux group at presentation and at 6-month follow-up

Variables		*Mean*	*SD*	*Median*	*IQR*	*z-value*	*p-value*
RFS—Pseudosulcus vocalis	Presentation	0.72	0.98	0.00	2.00	– 3.0000	0.0027
	Follow-up	0.00	0.00	0.00	0.00	Difference is significant	
RFS—Ventricular obliteration	Presentation	2.56	1.47	2.00	2.00	– 4.0410	5.31E-05
	Follow-up	0.24	0.66	0.00	0.00	Difference is significant	
RFS—Erythema/hyperemia	Presentation	1.36	1.41	1.00	2.00	– 3.4490	0.00056
	Follow-up	0.08	0.28	0.00	0.00	Difference is significant	
RFS—Vocal fold edema	Presentation	0.80	1.12	0.00	2.00	– 2.9720	0.00296
	Follow-up	0.08	0.40	0.00	0.00	Difference is significant	
RFS—Diffuse laryngeal edema	Presentation	0.20	0.50	0.00	0.00	– 1.8900	0.05878
	Follow-up	0.00	0.00	0.00	0.00	Difference is not significant	
RFS—Post-commissure hypertrophy	Presentation	1.88	0.83	2.00	0.50	– 3.2720	0.00107
	Follow-up	1.12	0.67	1.00	1.00	Difference is significant	
RFS—Granuloma	Presentation	0.00	0.00	0.00	0.00	0.0000	1.000
	Follow-up	0.00	0.00	0.00	0.00	Difference is not significant	
RFS—Thick endolaryngeal mucus	Presentation	0.40	0.82	0.00	0.00	– 2.2360	0.02535
	Follow-up	0.00	0.00	0.00	0.00	Difference is significant	

Table 4: Pre- and post-treatment posterior commissure hypertrophy score in laryngopharyngeal reflux patients

Sl. no.	*Age (years)*	*Sex*	*Presentation-RFS Post-commissure hypertrophy*	*6 Month-RFS post-commissure hypertrophy*
1	30	Male	2	2
2	44	Male	1	1
3	29	Male	2	1
4	25	Female	2	2
5	48	Female	0	0
6	28	Female	2	0
7	30	Male	1	1
8	32	Female	2	1
9	52	Female	2	1
10	40	Female	2	2
11	30	Male	2	2
12	40	Female	0	0
13	54	Male	2	1
14	26	Male	2	1
15	44	Female	3	1
16	65	Female	2	1
17	42	Male	3	1
18	60	Male	2	0
19	30	Female	2	2
20	44	Female	2	2
21	46	Male	1	1
22	72	Female	1	1
23	50	Male	3	1
24	32	Male	3	2
25	44	Male	3	1

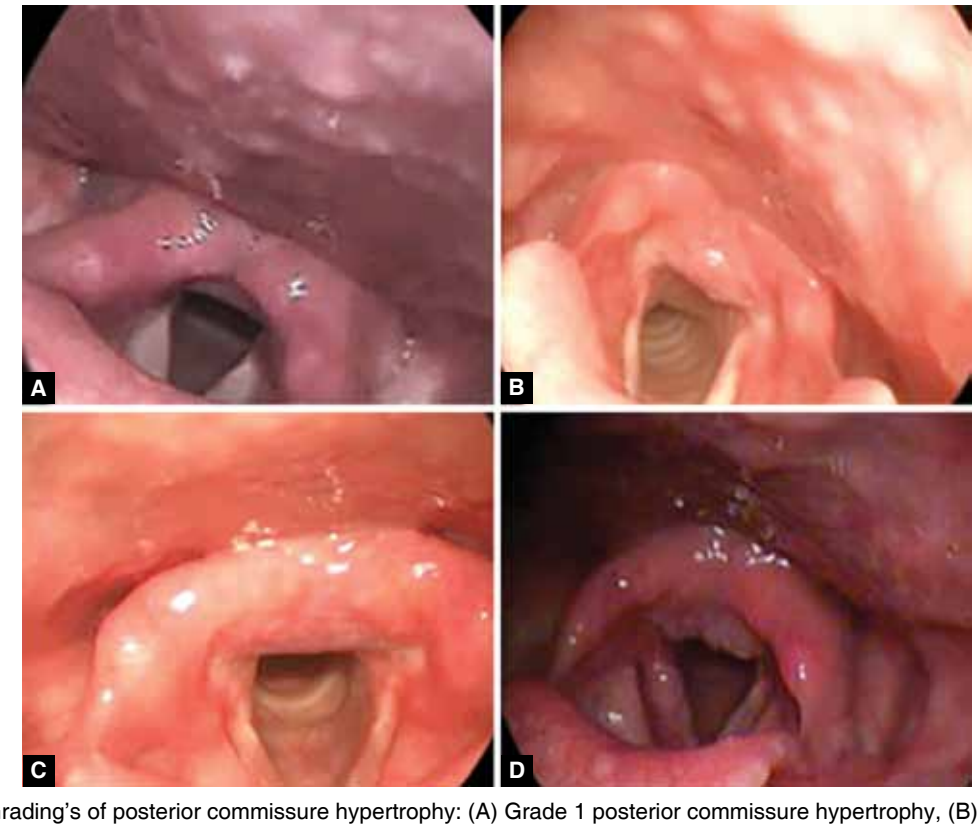
Among LPR patients, 23 out of 25 patients (92%) had posterior commissure hypertrophy, out which only two patients (8.6%) showed complete resolution of posterior commissure hypertrophy after 6 months of treatment. A total of 10 patients (43.47%) did not show any change in grading of posterior commissure hypertrophy. And 11 patients (47.82%) showed down grading of posterior commissure hypertrophy (Table 4).

DISCUSSION

The RFS has been used as a reliable and reproducible method for the objective measurement of LPRD. This method takes into account the entire glottis and supraglottis to create an overall reflux score.

Hypertrophy of the posterior commissure is a frequent finding in LPRD. It is graded as mild (1 point) when there is a moustache-like appearance of the posterior commissure mucosa and moderate (2 points) when the posterior commissure mucosa is swollen enough to create a straight line across the back of the larynx. Posterior commissure hypertrophy is graded as severe (3 points) when there is bulging of the posterior larynx into the airway and obstructing (4 points) when a significant portion of the airway is obliterated (Figs 1A to D).[1]

In our study, posterior commissure hypertrophy was present in 92% of patients of LPR. Mean RFS score for posterior commissure hypertrophy changed from 1.88 to 1.12 after 6 months of treatment. This drop though



Figs 1A to D: Grading's of posterior commissure hypertrophy: (A) Grade 1 posterior commissure hypertrophy, (B) grade 2 posterior commissure hypertrophy and (C and D) grade 3 posterior commissure hypertrophy

statistically significant cannot be used reliably as a clinical marker for response to therapy as only 8.6% of patients showed complete disappearance of posterior commissure hypertrophy and 43.47% of patients did not show any changes in grading of posterior commissure hypertrophy after 6 months of treatment. It was also present in 49.33% of patients who did not have LPR. Therefore, it can be used as a screening tool for diagnosis of LPR with high sensitivity (92%) but low specificity (50.66%). This correlates with a study by Hill et al[3] where it was reported that posterior commissure hypertrophy, as an isolated finding, is unreliable in determining the presence of active LPRD.

The reason for the persistence of pachydermia in adequately treated LPR patients is unclear. Kambic and Radsel[4] have shown that there is histologic transformation that results from the exposure of the interarytenoid area to gastric secretions. On exposure, this area can undergo epithelial hyperplasia of prickle and basal cell layers as well as some degree of keratinization.[4] This histopathological transformation could represent an irreversible process, which would explain the apparent persistence of pachydermia despite appropriate medical therapy.

CONCLUSION

Laryngopharyngeal reflux is a relatively common problem in patients with voice disorders and may be present in up to 25% patients with voice disorders.

The most common symptoms of LPR were throat clearing and globus sensation, while the most common signs were posterior commissure hypertrophy.

Presence of posterior commissure hypertrophy can be used as a screening tool to diagnose LPR, but its disappearance or absence cannot be used reliably as a clinical marker for response to therapy. It has to corroborate with other findings.

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