ABSTRACT

Objective: 1) To develop the applicability of nasopharyngeal epithelial cell with Narrow Band Image (NBI) to diagnose Laryngopharyngeal reflux disease (LPRD). 2) Estimate a correlation between a new questionnaire: Frequency Scale for the Symptoms of the Gastroesophageal Reflux Disease (FSSG) and LPRD.

Methods: We have 87 patients who underwent NBI using FSSG. Due to the pattern of nasopharyngeal epithelial cell NBI image, we distinguished grade 1: nothing, grade 2: moderate, and grade 3: severe. All patients answered FSSG questionnaire and were administered a PPI (rabeprazole10 mg). Student t test was used to compare each category out of 12 questions of FSSG for LPRD patients.

Results: Average age of patients was 59.3 years old. 69 (79%) patients were detected with grade 2 (46pts) and grade 3 (23pts). Nasopharyngeal epithelial cell images using digital nasopharyngeal epithelial cell images using digital image analyzer (Wavelet analyzer) and the need for using the wavelet analyzer (GraphPtiD.exe) (Fig.5).

Conclusion: We could show that nasopharyngeal epithelial cell pattern with NBI would be useful and specific feature to diagnose the LPRD. FSSG is not only used for GERD, it may be also utilized for LPRD clinically. We are currently confirming nasopharyngeal epithelial cell images using digital image analyzer (Wavelet analyzer).

METHODS AND MATERIALS

We have 87 patients who underwent NBI using FSSG. A blue light with the help of special narrow band filters enables enhanced imaging of the superficial tissue structures.

Due to the pattern of nasopharyngeal mucosa epithelial cell of NBI, we distinguished grade 1: nothing, grade 2: moderate, and grade 3: severe.

The FSSG consisted of 12 questions; 1. Do you get heartburn? 2. Does your stomach get bloated? 3. Does your stomach ever feel heavy after meals? 4. Do you sometimes subconsciously rub your chest with your hand? 5. Do you feel an unusual (e.g. burning) sensation in your throat or chest? 6. Do you feel a burning sensation in your throat? 7. Do you feel self conscious or embarrassed when you swallow? 8. Do you feel self conscious or embarrassed when you swallow? 9. Does some things get stuck when you swallow? 10. Do you get an unusual (e.g. burning) sensation in your throat or chest? 11. Do you burp a lot? 12. Do you get heartburn if you bend over? (Table)

Subjects answered according to the frequency of symptoms patients were scored as follows: never; 0, occasionally; 1, sometimes<2; often; 3, and always>4. Total score of more than 8 is considered to indicate probable GERD. Student t test was used to compare each question out of 12 questions of FSSG for LPRD patients.

We analyzed NBI digital photo to process a imaging detect using the wavelet analyzer (GraphPtiD.exe) (Fig.5).

RESULTS

Average age of patients was 59.3 years old.

Each photo shows; grade 1: nothing, (Fig.1) grade 2: moderate, (Fig.2) grade 3: severe (Fig.3)

Among evaluable patients, 69 (79%) patients were detected with grade 2 (46pts) and grade 3 (23pts).

Nasopharyngeal epithelial cell NBI showed a specific feature which nasopharyngeal epithelial round cells were modulated capillary cells raised among LPRD patients.

Patients who indicated Grade 3 showed more high score in FSSG

In only No.7 question of FSSG scale, Frequency (4) always showed significantly large number patients (Fig. 4 P<0.05)

In wavelet analysis, many white dots clearly revealed among patients in more than 20 of FSSG. In grade 2 and 3 cases, many white dots were detected by using the wavelet analyzer.

DISCUSSION

Most of LPRD patients complained discomfort in the throat as chief complaint. Though Patients were examined by using fiberscope and other imaging diagnosis tool like CT and MRI, It is very often to have no evidence of symptoms. NBI has been developed to enhance the visualization of microvasculature and mucosal patterns. Since the penetration depth of light of NBI is dependent on its wavelength, blue light would reach into mucosal imaging in terms of shortest wavelength. It enables NBI to detect vascular structures and patterns more accurate than conventional endoscopy. In this study, we noticed nasopharyngeal image of LPRD patients have some features like polygonal cells by examining with NBI.

As the deepest layer of cells of nasopharyngeal cells has a cuboidal or at times a columnar shape, followed by polyhedral cells and a superficial layer of rounded cells, continuous stimulation of gastric acid regurgitated might make nasopharyngeal epithelial mucosa degenerated.

We presumptively call this distinctive pattern mackerel cloud pattern (Fig.7)

Wavelet transform has developed in image processing. As image processing application requiring a detail edges and directions, one feature detection method is the two-dimensional discrete wavelet transform which decomposes the signal and image into each frequency component using low-pass and high-pass filters. These white dots may be considered nasopharyngeal feature cells degenerated of LPRD.

FSSG may have a useful tool to diagnose LPRD.

Among cases recognized more than 20 points of FSSG, white dots may increase in analysis area.

In future, we need more investigation what cells correspond with white dots accurately.

REFERENCES


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Applicability of Narrow Band Image (NBI) to diagnose Laryngopharyngeal reflux disease (LPRD)

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