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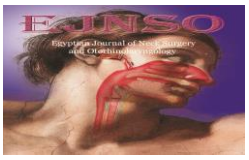

Diagnostic evaluation of upper gastro-intestinal endoscopy in combination with multi-slice computed tomography in patients with chronic refractory throat symptoms

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Abstract:

Objectives: Gastroesophageal Reflux disease (GERD) is usually known as the cause of chronic otorhinolaryngological complaints. GERD is present in up to 75% of patients with chronic refractory otorhinolaryngological problems, and gastric acid reducing drugs like PPIs therapy induces symptom relief in most of these patients.

Objective: To find if there is a benefit of using upper Gastrointestinal endoscopy in diagnosing patients with chronic refractory throat symptoms in comparison with MSCT of the Neck. To examine if there is an association between chronic throat symptoms and upper GIT disease.

Patients and Methods: Patients with chronic refractory throat symptoms undergone upper Gastrointestinal endoscopy in combination with MSCT of the Neck.

Results: There is a positive correlation between the occurrence of upper esophagitis and the presence of gastroesophageal reflux.

Conclusion: It is recommended that patients with refractory throat disorders with normal direct laryngoscopic examination with positive CT neck findings to do upper GI endoscopy as their initial assessment.

Key words: GERD, chronic refractory throat symptoms, gastro-intestinal endoscopy, multi-slice computed tomography and Reflux esophagitis.

Introduction

Gastro esophageal Reflux disease (GERD) is usually known as the cause of chronic otorhinolaryngological complaints. [1]

Gastro esophageal reflux disease (GERD) is present in up to 75% of patients with chronic refractory otorhinolaryngological problems, and gastric acid reducing drugs like PPI therapy induces symptom relief in most of these patients. [2]

There is a positive correlation between occurrence of upper esophagitis and presence of gastro-esophageal reflux. upper GI endoscopy is indicated as an initial assessment in refractory throat patients with normal direct laryngoscopic examination especially if they had CT neck findings. [2]

Aim of the work

To detect the efficacy of upper gastrointestinal endoscopy in diagnosis of patients with chronic refractory throat problems and is it a beneficial to be combined with MSCT of the Neck to diagnose upper GIT problems especially if there is positive throat symptoms and their relation together.

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Patients and methods:

Patients:

From May 2019 to November 2021, 100 consecutive patients with chronic refractory throat problems who sought medical advice at ENT outpatient clinic at Minya University Hospital for our study. Throat symptoms were dysphagia, globus pharyngeus, frequent throat clearing, hoarseness of voice, spitting of blood and cough.

Exclusion criteria: Patients having any one of the following criteria were excluded from study:

1. Patients with history of rheumatological disease, chronic liver disease, chronic kidney disease or cardiac disease or previously diagnosed chronic GERD or received treatment for reflux within 3 months of enrollment.
2. Patients previously diagnosed by any malignancy or on radiotherapy, chemotherapy treatment.

The following tests were performed on each patient.:

I- Taking a complete medical history that includes otolaryngological history and any GIT illness history.
II- ENT examination for all patients.
III- A multi-slice CT scan.
IV- Upper GI endoscopic examination of the esophagus with multiple biopsies from different parts of the esophagus (upper, middle, and lower third) and any suspected lesions.
V- Histopathology of these biopsies.

Upper GI Endoscopy and Biopsy, Histopathology:

The patient prepared for endoscopy by nothing peroral for six to eight hours before examination and under intravenous sedative drugs like midazolam or propofol and placed in the left lateral decubitus position.

Upper GI endoscopy was done after overnight fasting for 8hours.endoscopy done under mild sedation using I.V midazolam. Examination of esophagus, Patients and Methods 79 stomach and duodenum till second part using “Pentax video scope EG-2940” after being disinfected using standard technique Biopsies taken from upper, middle and lower esophagus then preserved in (10% formal saline) till prepared for Histopathological examination through dehydration to prepare paraffin block.

MSCT of the neck:

studies were performed with a 16-detector MDCT scanner (Bright Speed 16; GE Medical Systems). Contrast material was injected with a power injector (Medrad, Stellant) through an 18- or 20-gauge catheter into intravenous route. The acquisition parameters were 120 kVp, 440 mAs, a helical pitch of 1.375:1, 0.5-second scan 90-time, 16 x 1.25 mm detector configuration, second total exposure time, 1.25 mm helical slice thickness, and 1 mm reconstruction interval with a large FOV. Image reconstruction for image reconstruction, the axial source images were transferred to an Advantage Workstation Volume Share 2 (GE Healthcare). Multiplanar reformatted images (MPR) images were obtained in the coronal and sagittal planes. MPR images were used to evaluate anatomic relation of the lesions

Statistical analysis:

All statistical calculations were done using SPSS, version 20. Cleaning of data as a first step was done to detect missing values and invalid responses. 100 Quantitative data were presented by mean, standard deviation while qualitative data were presented by frequency distribution. The Chi- square

test and Fisher exact test "used if more than 20% of cells are less than 5" were used to compare between proportions. Paired sample t-test was used to compare two means before and after for the same group while One Way ANOVA was used to compare means more than two groups. P value < 0.05 was considered statistically significant and all statistical tests were 2 tailed.

Results

Our study is a pilot study, was carried out in the endoscopic unit at Minya University Hospital from May 2019 to November 2021. 100 consecutive ENT patients with persistent and unexplained otorhinolaryngological complaints.

For the study, 44 men (44%) and 56 women (56%) ranging in age from 22 to 80 were enrolled. Ten (10%) patients had diabetes, ten (10%) patients had thyroid illness, and four individuals had hypertension. 8 patients smoked, and none had ever consumed alcohol (0%). Table (1).

Table 1: - Epidemiological data of the studied patients (N= 100)

Age	22-80
(Range, mean ± SD)	54.8±15.6
Sex	
Male	44(44%)
Female	56 (56%)
History of any chronic illness	
Hypertension	4(4%)
Diabetes mellitus	10(10%)
Thyroid disorders	8(8%)
Smoking	8(8%)
Alcohol	0(0%)

The most important throat symptoms recorded by the patients were dysphagia (92%), Globus pharyngeus (48%), chocking (44%), frequent throat clearing (72%), dry cough (16 %), spitting of blood (8%), sore throat (20%), and hoarseness of voice(12%).along with their significant symptoms, the majority of patients had additional two or more otorhinolaryngological symptoms (Table 2, Fig.1).

Table 2: Prevalence of Refractory Throat symptoms in studied group

Throat symptoms	**NO (%)**
Dysphagia	92 (92%)
Dry cough	16 (16%)
Spitting of blood	8(8%)
Chocking	44(44%)
Frequent throat clearing	72(72%)
Sore throat	20(20%)
Globus	48(48%)
Hoarseness of voice	12(12%)

Multi slice Computed Tomography (MSCT):

CT scanning was done for all studied patients. 16% had normal CT finding, 80% had circumferential mural thickening which involve the pharyngoesophageal junction in 32(32%) patients, Upper esophagus in 36 (36%) patients, Lower esophagus in 20 (20%) patients and Greater curvature of stomach in 12 (12%) patients. Another important CT finding is enlarged cervical Lymph nodes seen in 4(4%) patients (Table 3, Fig 2).

Endoscopic finding of ENT patients:

GERD grade A was seen in 16 (16%), grade B in 8 (8%) patients and grade C in 8(8%) patients while Barrett's esophagus seen in 8(8%) patients. upper endoscopy revealed upper esophagitis in 40 (40%) patients, middle esophagitis in 4(4%) patients and lower esophagitis 4 (4%) patients.

There is mass in esophagus in 20 (20%) patients. There is gastritis in 40 (40%) patients and Duodenitis in 4 (4%) patients (Table 4, Fig 3).

Table 3: - CT findings of all studied group

CT finding	**NO (%)**
Normal finding	**16(16%)**
Enlarged cervical ln	**2(4%)**
Circumferential mural thickening	**80(80%)**
Pharyngo-esophageal junction	**32(32%)**
Upper esophagus	**36(36%)**
Lower esophagus	**20(20%)**
Greater curvature of stomach	**12(12%)**

Table 4: Endoscopic findings in studied patients

Endoscopic Findings	**NO (%)**
GERD	
GRADE A	16(16%)
GRADE B	8 (8%)
GRADE C	8 (8%)
Barrett Esophagus	8 (8%)
Esophagitis	
Upper	40(40%)
Middle	4(4%)
Lower	4(4%)
Esophageal Mass	20(20%)
Gastriris	40 (40%)
Duodenitis	4(4%)

Biopsy was taken from Upper, middle and lower esophagus for histopathological examination. Normal microscopic examination of esophageal mucosa seen in 16 (16%) patients, reflux esophagitis was detected in 20(20%) patients, eosinophilic esophagitis in 8 (8%) patients, mild chronic nonspecific esophagitis in 32(32%), hyperplastic squamous epithelium in 16(16%) and dysplasia of squamous epithelium in 8 (8%) patients. (Table 5, Fig 4).

Regarding to the association between and throat symptoms and histopathological finding, we recorded that there is only significant relationship between frequent throat cleaning and sore throat with different histopathological finding (P = 0.008 and P= 0.05), respectively. While there is no significant relationship in other throat symptoms dysphagia(P=0.6), dry cough (P=0.2), spitting of blood (P=0.1), chocking (P=0.1), Globus (P=0.3) and hoarseness of voice (P= 0.2) Table (6)

Table 5: Histopathological examination of esophageal mucosal Biopsy

Histopathology of biopsy of esophageal mucosa	**N0 (%)**
Normal finding	16(16%)
Reflux esophagitis	20(20%)
Eosinophilic esophagitis	8(8%)
Mild non-specific esophagitis	32(32%)
Hyperplastic squamous epithelium	16(16%)
Dysplasia of squamous epithelium	8(8%)

Regarding to the prevalence of Multi slice Computed Tomography (MSCT) finding in relation to upper throat symptoms, we recorded that there is significant relationship between Dysphagia (P =0.001), frequent throat cleaning (P=0.005), sore throat (P=0.003) and Globus (P=0.03) with MSCT finding. While other throat symptoms had no significant relationship with MSCT finding as dry cough (P=0.7), spitting of blood (P=1), chocking (P=06), and hoarseness of voice Table (7)

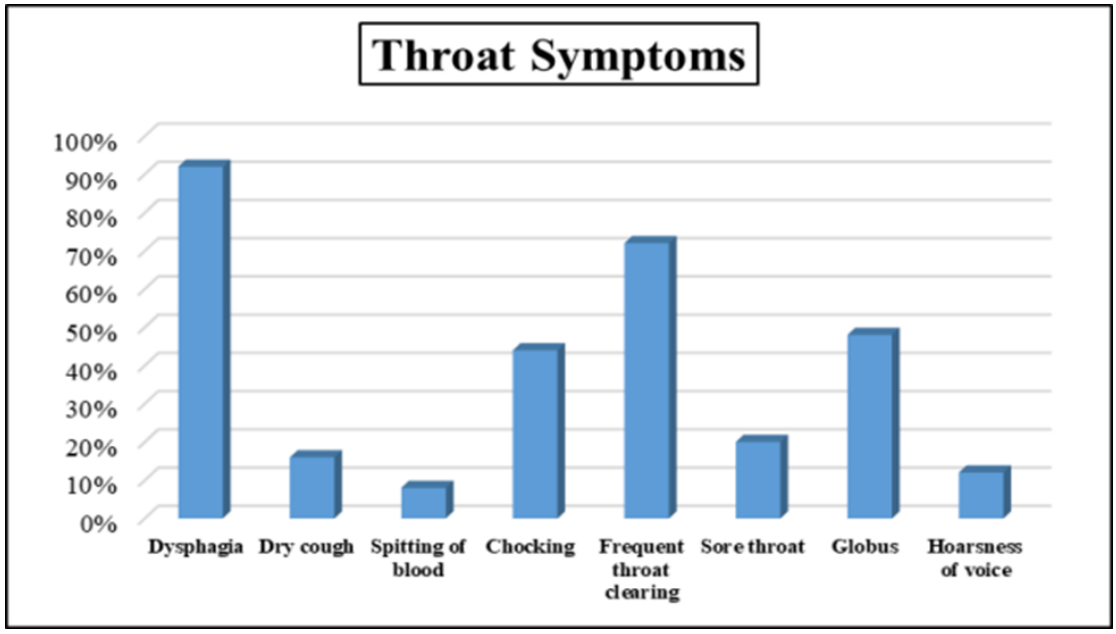

Fig 1: Prevalence of Refractory Throat symptoms in studied group

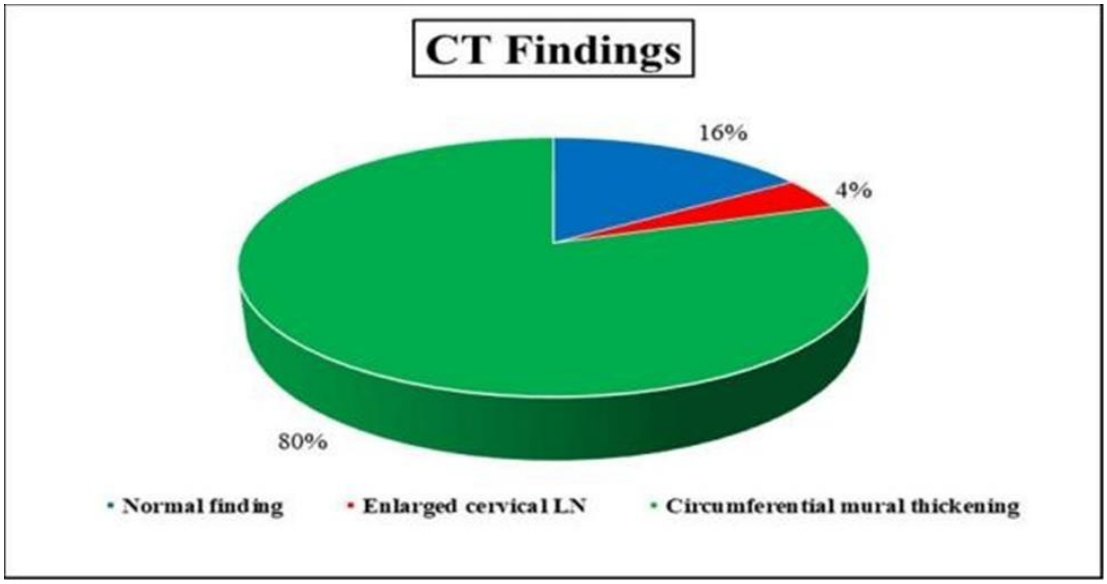

Fig (2): CT findings of all studied group

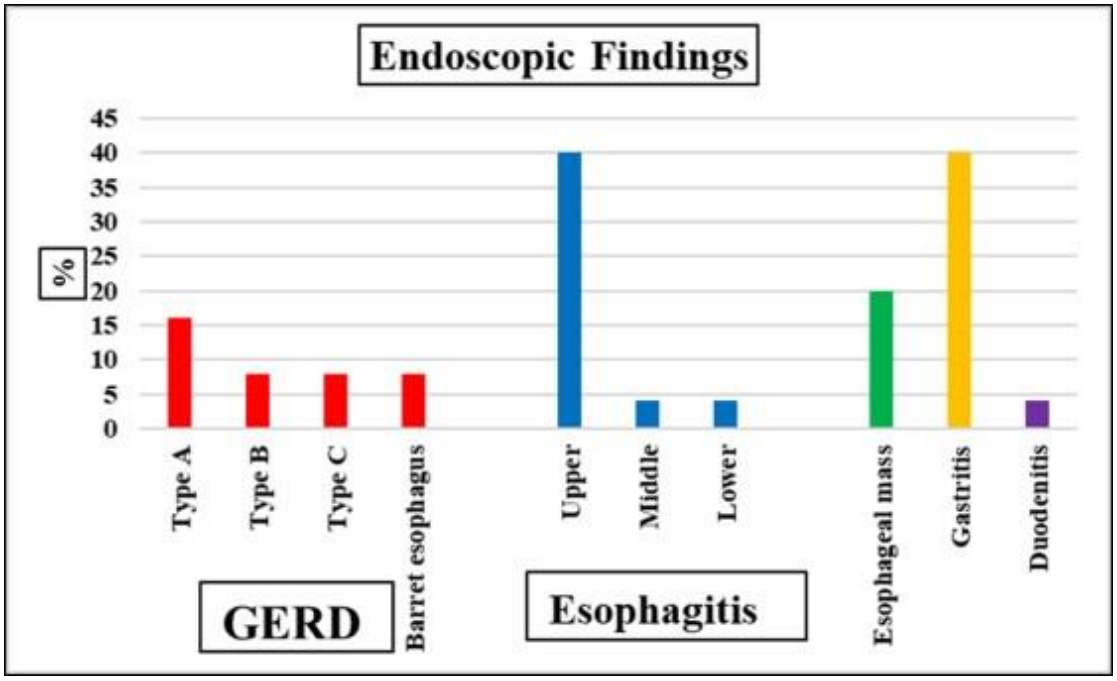

Figure 3: Endoscopic findings in studied patients

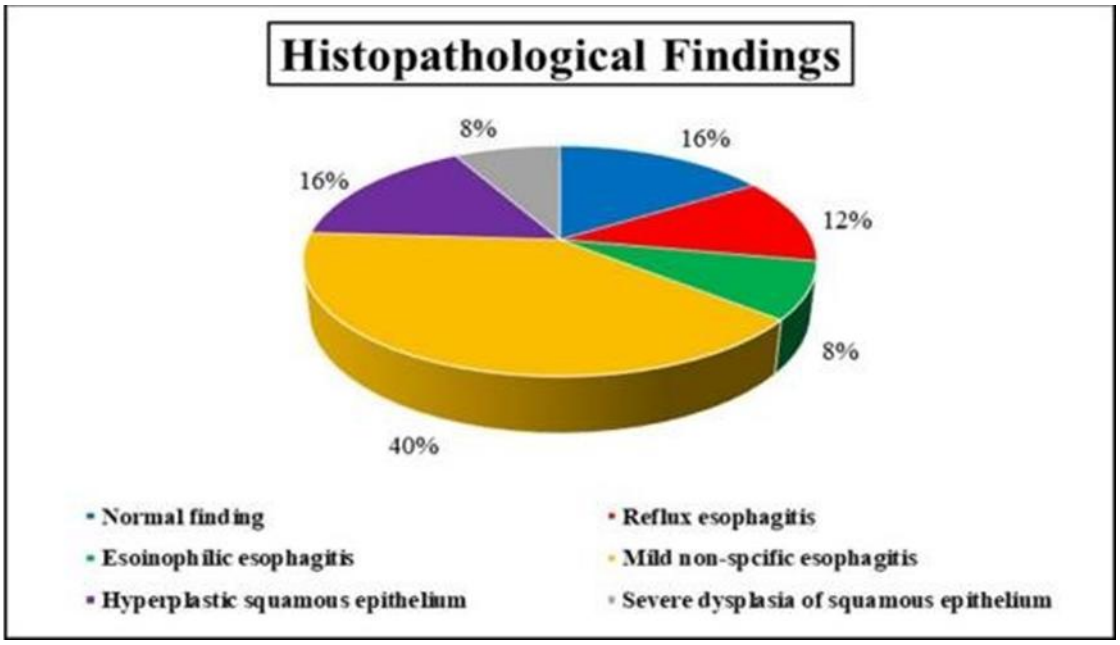

Figure 4: Histopathological examination of esophageal mucosal Biopsy

Table 6: The prevalence of histopathological finding in relation to upper throat symptoms.

Histopathological examination	Dysphagia	Dry cough	Spitting of blood	Chocking	Frequent throat clearing	Sore throat	Globus	Hoarseness of voice
Normal finding (n=8)	16(17.4%)	0(0%)	0(0%)	4(9.1%)	8(11.1%)	4(20%)	8(16.7%)	8(16.7%)
Reflux esophagitis (n=6)	12(13%)	0(0%)	0(0%)	4(9.1%)	4(5.6%)	8(40%)	4(8.3%)	4(8.3%)
Eosinophilic esophagitis (n=4)	8(8.7%)	0(0%)	4(50%)	4(9.1%)	8(11.1%)	0(0%)	4(8.3%)	4(8.3%)
Mild non- specific esophagitis (n=20)	36(39.1%)	12(75%)	4(50%)	20(45.5%)	36(50%)	4(20%)	24(50%)	24(50%)
Hyperplastic squamous epithelium (n=8)	12(13%)	4(25%)	0(0%)	12(27.3%)	8(11.1%)	4(20%)	8(16.7%)	8(16.7%)
Dysplasia of squamous epithelium (n=4)	8(8.7%)	0(0%)	0(0%)	0(0%)	8(11.1%)	0(0%)	0(0%)	0(0%)
P value	0.6	0.2	0.1	0.1	**0.008***	**0.05 ***	0.3	0.2

Fisher's exact test-* Significant difference at P value = 0.05

Table (7): The prevalence of Multislices Computed Tomography finding in relation to upper throat symptoms

MSCT	Dysphagia	Dry cough	Spitting of blood	Chocking	Frequent throat clearing	Sore throat	Globus	Hoarseness of voice
Normal finding (n=8)	12(13%)	4(25%)	0(0%)	12(27.3%)	4(5.6%)	4(20%)	4(20%)	0(0%)
Enlarged cervical lymph nodes (n=2)	0(0%)	0(0%)	0(0%)	0(0%)	4(5.6%)	4(20%)	4(20%)	0(0%)
Circumferential mural thickening (n=40)	80(87%)	12(75%)	8(100%)	32(72.7%)	64(88.9%)	12(60%)	12(60%)	12(100%)
P value	0.001*	0.7	1	0.06	0.005*	0.003*	0.03*	0.1

MSCT: Multislices Computed Tomography -Fisher's exact test- *: Significant difference at P value = 0.05

Discussion :

In this study, we sought to determine if upper gastrointestinal endoscopy was superior than MSCT of the Neck for diagnosing individuals with chronic refractory throat problems. to investigate whether there is a link between upper GIT disorders and chronic throat complaints.

In the present study, we looked into whether any consecutive patients with upper refractory throat symptoms had any abnormalities found during the upper GI endoscopy. We searched for any GIT abnormalities during performing upper GI endoscopy in patients with refractory throat symptoms.

The most important symptoms of the throat recorded by the patients in our study were dysphagia (92%), Globus pharyngeus (48%), chocking (44%), frequent throat clearing (72%), dry cough (16 %), spitting of blood (8%), sore throat (20%), and hoarseness of voice (12%).

Regarding endoscopic findings, esophagitis found in 24 patients. With high prevalence of upper esophagitis (40%), only 8% had middle and lower esophagitis). A similar study by **Ossako et al** [3] reported that prevalence of esophagitis was 10% of otorhinolaryngological patients with refractory throat symptoms.

Similarly **Batch et al,** [4] diagnosed endoscopic esophagitis in 63% in patients with globus and **McNally et al,** [5] diagnosed esophagitis in 63% in patients complaining from hoarseness of voice.

The high prevalence of upper esophagitis (40%) reported in our study may be explained by **El Serage et al, [6]** who suggested patients with esophagitis had supra esophageal reflux. One possible explanation for this could not be only more than reflux episodes up to upper two thirds of the esophagus in addition to a short period of upper esophageal sphincter (UES) contraction in response to reflux episodes, so increasing the possibility of that gastric contents refluxed up to the laryngopharynx **Torrico et al** [7].

Our study reported that significant association between dysphagia and dry cough with upper esophagitis. This is like results by **Poelmans et al, [2]** which showed that patients with cough commonly have esophagitis as an association and significantly higher than patients with other throat symptoms like Globus (P=0.01).

The most important finding of our study is that most patients had different grades of GERD (40%) on upper GI endoscopy from them 8 % had Barrett's esophagus. Also, there is significant association between dry cough, Globus and chocking with different classes of GERD (P=0.004) Based on these findings upper GI endoscopy advised in patients with refractory ENT symptoms especially with low cost of endoscopy and high risk of Barrett's esophagus.

In our study we found that Reflux esophagitis usually associated with globus sensation as seen in **Tokashiki et al [8]**.

In accordance with our results, study done by **Ahmed et al,** [9] who reported that globus and throat clearing were helpful symptoms in diagnosing of laryngopharyngeal reflux.

Regarding methods used in our study we used Multi Slice Computed tomography of the neck in all of our patients , which revealed Circumferential mural thickening in 80 % of cases (n=40) which involve The pharyngo esophageal junction in 32% (n=16) of cases ,Upper esophagus in 36% (n=18) of cases ,Lower esophagus in 20% (n= 10) of cases and Greater curvature of Discussion 99 stomach in 12% (n=6) and enlarged cervical Lymph nodes in 4% of cases (n=2) as well as no significant findings in 16 % of cases There are no significant data in previous studies using the MSCT in evaluation of patients with refractory throat symptoms to be comparable with our results.

Conclusion:

Upper esophagitis and gastroesophageal reflux are highly prevalent in patients with refractory throat complaints and in patients with refractory throat complaints with normal direct laryngoscopic examination and CT, the usage of upper GI endoscopy as a preliminary examination should be encouraged especially the endoscopy is inexpensive and the high risk of complications related to GERD or Barrett's esophagus.

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