The Role of Barium Swallow Pharyngoesophagography in the Management of the Globus Pharyngeus: Our Ten Years Local Experience of Asian Population

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Abstract Patients with globus pharyngeus referred for barium swallow pharyngoesophagography in a local hospital from 1/7/1999 to 30/6/2009 were identified. Their fluoroscopic images were reviewed, and their outcomes were used as gold standard. A total of 908 patients with globus pharyngeus were referred for barium swallow in the period. There were 783 patients with normal barium swallow and 125 patients with abnormal barium swallow findings. All patients aged below 30 years had normal barium swallow result and unremarkable follow up. The sensitivity and specificity of barium swallow were 25.6 and 97.5% respectively; and the positive predictive value and negative predictive value were 61.5 and 89.1% respectively. The overall accuracy was 87.6%. Barium swallow is of limited diagnostic value in patients with typical globus pharyngeus, and it is not recommended in these patients, especially with young age.

Keywords Barium swallow pharyngoesophagography · Globus pharyngeus

Introduction

Globus pharyngeus is a benign disorder and it is a feeling of something in the throat. Its stems from the Latin word meaning “ball”. Barium swallow pharyngoesophagography is a common investigation for patients with symptoms of

globus pharyngeus. However, many studies have concluded that barium swallow is not necessary in these patients [1–3]. In addition, it is a study with remote complication like aspiration and radiation exposure. The effective radiation dose has been found to be 1.5 mSv, [4] and it results in a lifetime risk of fatality of 1/6000–1/13000 depending on the age of patient [5]. This study aimed to investigate the outcome of the patient’s globus pharyngeus with barium swallow in our centre for the past 10 years.

Materials and Methods

This retrospective study had been approved by the local institutional review board.

Subjects

All patients with typical globus pharyngeus who were referred for barium swallow in a local hospital in Hong Kong from 1/7/1999 to 30/6/2009 were identified.

Exclusion Criteria

Patients with associated symptoms apart from globus pharyngeus were not included. Patients who refused or failed to tolerate the examination were excluded from the study. Patients with defaulted follow up were also excluded.

Imaging Study

The patient was instructed to take bolus of barium at a time and swallow under intermittent fluoroscopic screening (Philips Diagnost 76 Plus system, Philips Medical Systems,

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Table 1 The results of the barium swallow pharyngoesophagography in patients of globus pharyngeus with the different age range

Findings	Age								Total	%
	10–19	20–29	30–39	40–49	50–59	60–69	70–79	80–89		
Normal	8	37	169	267	159	95	45	3	783	86.23
Esophageal motility disorder			3	5	9	13	8	3	41	4.51
Osteophyte compression			4	2	11	9	4		30	3.30
Suspected of malignancy			3	4	3	2	4	1	17	1.87
Laryngeal penetration or aspiration			1	1	5	4	3		14	1.54
Esophageal diverticulum or fistula				3	4	2	2	1	12	1.32
Gastroesophageal reflux or hiatus hernia			2	1		2	2		7	0.77
Stricture						1	1		2	0.22
Aberrant vascular compression				1					1	0.11
Esophagitis			1						1	0.11
Total	8	37	183	284	191	128	69	8	908	100.00

Andover, Massachusetts, United States or Simens Artis zee Multi-purpose system, Muenchen, Germany). Spots films of the laryngopharynx and esophagus of anterior, lateral and bilateral oblique projections were taken in both erect and prone positions, with double contrast technique. Motion recordings (digital cine loops, 2–4 frames per second) of the pharynx in frontal and lateral positions during swallowing were included. The motility of the esophagus was recorded.

Diagnostic Criteria

Any abnormal findings including filling defect, focal out pouching, motility disorder, stricture, gastro-esophageal reflux etc. were classified as positive barium swallow studies. The clinical outcomes including the progress of the symptom of globus pharyngeus, oesophago-gastro-duodenoscopy or flexible fibre-optic endoscopy findings of these patients and manometry findings where available were reviewed. Patients with relieving or no progression of the symptom in the follow up were classified as normal. Patients with abnormal endoscopy or any investigation findings related to the symptom of globus pharyngeus were defined as abnormal outcome.

Statistical Analysis

The specificity, sensitivity, positive predictive value and negative predictive value were documented. The overall accuracy was calculated.

Results and Analysis

Over the period of 10 years, a total of 1893 successful barium swallow pharyngoesophagography were done, and

48.0% (908/1893) of them were performed in patients with globus pharyngeus. (Table 1) There were 783 (86.2%) patients with normal barium swallow and 125 (13.8%) patients with abnormal barium swallow. The mean age was 49, and the ratio of female to male was 2.2:1. On subsequent follow up, 415 (45.7%) patients had endoscopy, and 91.6% (380/415) of them were found to be normal. Combining with the endoscopy findings and clinical outcome, the specificity and sensitivity of barium swallow were 97.5 and 25.6% respectively. The positive predictive value and negative predictive value were 61.5 and 89.1% respectively. The overall accuracy was 87.6% (Table 2). All the barium swallow findings of “suspected of malignancy” were normal in the follow up endoscopy and there was no case of underlying malignancy. There was no patient aged below 30 year old with abnormal barium swallow result, and their follow up were all normal. 14 patients (1.54%) complicated with aspiration during the procedure and all of them had chest physiotherapy afterwards, and there was no aspiration pneumonia.

Discussion

Globus pharyngeus is a common problem with multiple possible etiologies [6]. The typical complaint is a sensation

Table 2 The outcomes of the globus pharyngeus patients with positive and negative barium swallow pharyngoesophagography

	Positive barium swallow	Negative barium swallow	Total
Abnormal outcome	32	93	125
Normal outcome	20	763	783
	52	856	908

of a ball or lump in the throat and not accompanied by other symptoms, and it is a diagnosis of exclusion. Barium swallow pharyngoesophagography is usually requested to exclude underlying pathology, so as to reassure patients. Our study aims to answer the usefulness of barium swallow in terms of specificity, sensitivity, positive predictive value, negative predictive value and accuracy. To our knowledge, these data are lacking in the existing publications.

There was a female predominance, a similar finding in other studies [3, 7]. In our study, there was no patient with outcome of malignancy, suggesting that the prevalence of underlying sinister disease is very low. Though many studies failed to identify any malignancy in the far majority of patients with globus pharyngeus, [6, 8, 9] there were still exceptions [10, 11]. The specificity of barium swallow was high, but its sensitivity was low in our study. Therefore, the use of barium swallow in ruling out any underlying serious pathology in patients with globus pharyngeus is of questionable value. Transnasal fibre-optic endoscopy and flexible oesophagoscopy are more useful investigative tools [7, 10, 12].

The association of globus pharyngeus with distal oesophageal lesions such as hiatus hernia or gastroesophageal reflux remains controversial, [1] and the incidence of these lesions was low in our study. Nevertheless, pH assessment or flexible fiberoptic endoscopy would be more sensitive than barium swallow in these cases [13, 14].

The barium swallow had low positive predictive value in our study. Barium swallow pharyngoesophagography are used to help alleviate the anxiety in the patients with globus symptoms as much of them are anxious. The significant number of false positive cases might result in unnecessary further investigation, as well as further increasing patient anxiety. There was no patient below 30 year old with adverse clinical outcome. We therefore postulated that barium study is of limited value in young patients with typical symptom of globus pharyngeus. More studies are appreciated in this area.

The main limitation of the study is its retrospective nature. Although only about 50% of the patients had endoscopy for globus pharyngeus, long term follow-up of these patients were achieved clinically. As such, both can be used as the gold standard for the patients' outcomes reliably.

Conclusion

Our findings suggested that barium swallow has low sensitivity and low positive predictive value in patients with typical globus pharyngeus. It is not recommended for these patients, especially those of young age, so as to reduce unnecessary radiation exposure, patient's anxiety and complication.

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