

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## Foreign Bodies of Thyroid Grand

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### ABSTRACT

This article is dedicated to description of such rare condition as foreign bodies of thyroid grand (FBTG). Rarity and even casuistry of such cases explain the absence of systematic knowledge in modern literature on this matter. In this article we have attempted to integrate data on FBTG issue, which is mainly of descriptive nature in regards to separate clinical observations. We consider it necessary to get the information on this issue across practicing physicians at large, who must remember about this rare, but possible condition, so that they can timely detect it and provide knowledgeable assistance. We have also developed an algorithm of diagnostic exploration that can be applied to patients suspected of foreign foodies (FB) in upper gastrointestinal (GIT) and upper respiratory airway (URA).

**Keywords:** foreign body, thyroid grand, migration, fish bone.

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## INTRODUCTION

While analyzing reported information on FBTG issue, we concluded that publications on this topic only describe separate clinical events [1-10]. Considering the rarity of the pathology in question, we find it necessary to provide literature review on this matter with a view of compilation and systematization of information on the pathology in question.

## METHOD

We have analyzed reports on FBTG in periodic publications [1-10]. In the vast majority of cases these were foreign sources, and only one case was described in Russian-language literature (our own observation).

## THE MAIN PART

Our own *clinical observation* motivated us to throw light on the problem of FBTG [1]. Below is short description of such case. Female patient, 73 years old, applied to ENT Unit of Belgorod municipal hospital No.2, complaining of the feeling of foreign body in her throat, painfulness while swallowing, neck pains and temperature rise up to 38.0°C. Anamnesis showed that 5 days prior to application to hospital, the patient had eaten fish and had felt the prick of a fish bone. The patient tried to remove the foreign body by herself, squeezing neck tissues from the outside. Two days prior to application her temperature raised up to 38.0°C, pharyngalgia increased, neck tenderness appeared. At admission pathologies of ENT organs were not detected; pharynx mucosa was pink, smooth, without reactive changes, FB and place of possible discission was not visualized. During the examination acute palpation tenderness of the neck in projection of right lobe of thyroid gland was evident. The patient was sent to ultrasound investigation (USI) of neck's tissues: in right lobe of thyroid gland (TG) hyperechoic linear structure was visualized, which had a length of 21 mm, at 12 mm depth (the upper edge) from skin surface, at 24 mm depth (the bottom edge). Around upper and bottom edges of formation hyperechoic areas of 11×6 mm and 12×11 mm were found. Photoelectronic spectroscopy (PES) was performed: FB, prolapse of esophageal wall and bulb-shaped sinuses were not found. The patient was sent to multi-layer spiral CT (MSCT) of neck for detection of precise location of FB that had migrated, its size and mutual location arrangement in relation to other neck's structures.

A series of scans in right lobe of thyroid gland (TG) a foreign body of 20×2 mm size was found (bone), around which hypodensive zone (infiltration) was seen. Distinct relation of FB with esophagus was not visible. Having defined that inflammatory process was of a local character (TG) and didn't have tendencies for generalization, we chose a salvage measures, like antibacterial and anti-inflammatory therapy, and later in cold period the patient was operated on. Considering the peculiarity of FB's location (full thickness of right lobe of TG in its longitudinal axis), as well as septic character of the process (condition of thyroid gland was assessed intraoperatively), we performed hemithyroidectomy. In 7 days after operation the patient recovered and was dismissed from the hospital unit.

Foreign bodies of upper gastrointestinal and upper respiratory airway the most frequently are detected in palatal and lingual tonsils, valecular sinuses and piriform sinuses [2]. FB of mentioned localization can be easily exsomatized outpatiently. In less number of cases FB are detected in esophagus, and can be exsomatized outpatiently as well [1, 11]. More rarely FBs percolate behind mucous coat and locate in full thickness of its wall. In some cases FBs can migrate through the full thickness of esophageal wall and site in cervical soft tissues [1, 3]. There have been recorded a lot of cases that describe ingress of FB into upper gastrointestinal, but only a few of them led to esophagus' perforation and even lesser amount of them migrated beyond esophagus [1, 4].

International medical practice has been actively used the term "Migrating foreign bodies" [5]. Such migrating foreign bodies can be absolutely indifferent clinically, without manifesting themselves, or may lead to severe, specifically, septic complications [5].

*Preconditions* of FB migration from esophagus to thyroid gland are conditioned by cervical esophagus' topography. Cervical esophagus, having the length of 5-6 cm, is located at the level of VI and VII cervical vertebrae at the back and somewhat left of primary part of trachea. At this place esophagus has a contact with TG [12]. Migrations of FB are favoured not only by FB size, but also by its form (too U-shaped). Women have

FBs that are bigger than those men have, their right lobe is developed better than the left one, and both lobes are not equal in form [13]. The abovementioned facts confirm clinical observations, stating that FBTG are more common to be found in women [6]. Furthermore, left lobe is often involved in the process [3, 5, 9, 13], which seems to be related with cervical esophagus' topography. M.H. Hohman et al. present the analysis of 11 articles, which describe 15 cases of FBTG. All the patients were female [6]. Genesis of FB migration to TG is also significantly influenced by patients' actions. For instance, many patients had mechanical action applied to mucous coat of laryngopharynx, esophagus and neck soft tissues, caused by eating bread crusts, attempt to extract FB without medical assistance, displacement of neck's structures by their hands [1]. It is interesting that in majority of cases FB were fish bones, although they were also presented with other foreign bodies, like metal wire, chicken bones etc. [6]

### *Diagnostics*

The majority of authors consider MSCT of neck organs to be the gold standard of FBTG's diagnostics, emphasizing high sensitivity (100%) of this method [1, 6, 8]. Side-plane neck radiography helps detecting the sheer fact of FB's presence, though it can not help define its exact localization [1,4]. USI of neck tissues can also be named as an important diagnostic instrument for identification of size, type, location and orientation of migrated FB and its connections with other neck structures [8]. We believe that ultrasound of neck tissues should be added in obligatory list of examinations of patients with undetected FB of pharynx, larynx and esophagus with a view to increasing probability of foreign body's identification in thyroid gland. Almost all healthcare centers are equipped accordingly to be able to provide this examination, and this procedure allows establishing the fact of presence of FB in TG or in neck tissues.

We have developed diagnostic algorithm that can be applied to patients with provisional diagnosis "foreign foodies in upper gastrointestinal and upper respiratory airway". The algorithm is presented below. At first, such patients, applying to healthcare centers, must be examined by a surgeon and an otorhinolaryngologist. If at primary examination FB is visualized, it must be removed with the usage of special equipment and appropriate methods. At this stage an additional examination may be performed, if necessary (PES, USI, MSCT). If at primary examination FB is not detected, such patient should be sent to endoscopist, who should remove FB in case it is found, using special equipment and appropriate methods. Endoscopist may also put on additional examination (PES, USI, MSCT). If after endoscopist's examination FB is still not found, it is reasonable to refer the patient to ultrasound investigation of neck tissues. If FB is detected during ultrasound investigation, MSCT of neck tissues should be prescribed, and after that, depending on FB's condition and localization (including the one that migrated), surgical removal should be taken or case follow-up on an outpatient basis or, if necessary, at hospital. If FB is not detected at ultrasound investigation of neck, an outpatient case follow-up is recommended, or, if necessary, case follow-up on hospital basis. If necessary, additional examination is prescribed (PES, USI, MSCT).

### *Treatment principles*

Each and every one of authors defines surgical treatment method as a primary one. In such case interference range varies from delicate endoscopic handles (excision of FB at PES) up to radical ones, like hemithyroidectomy with external approach.

Y.H. Goh. and N.G. Tan described four cases, when fish bone went through esophagus and migrated to TG. In one case the bone stayed there for 11 years. All these FBs were successfully removed by external approach, and only one case required application of hemithyroidectomy [1, 7]. Yu-Hsing Lin et al. believe that surgical removal of FBTG can be performed with minimal tissue damage, pointing out that such interference should be performed as soon as possible [1, 9]. M.H. Hohman et al. also insist on surgical removal of FB as a final and definitive treatment method in case FB can't be removed endoscopically and even in case there are no complications, caused by its migration [1, 6]. While choosing the tactics, one must consider not only local status, process's prevalence and intensity of inflammatory reaction, but system reaction of patient's organism as well.

If inflammatory process is local (in TG only), no tendency of its generalization is observed and there is no possibility to remove the FB endoscopically, the treatment should be started conservatively (system

antibacterial and anti-inflammatory therapy). Then in the cold period a surgical interference should be performed with consideration of peculiarities of FB's location and condition of TG [1, 9].

### CONCLUSION

We can recommend the following tactics for case management of patients with FBTG: if FB can't be removed endoscopically and in case septic complications are not present, the treatment should be performed in two stages in order to minimize the risk of their occurrence. The first stage is a conservative one and the second stage is a surgical one. If septic complications have already occurred, emergency surgery is performed with concurrent massive antibiotic therapy [1, 6]. At suspicion on FB of upper GIT and URA we recommend using diagnostic algorithm, suggested by us.

### DEDUCTIONS

FBTG is a rare and tactically complicated pathology. Practicing physicians of various specialties must consider the possibility of development of such condition in patients with FB of upper GIT and URA, in order to provide medical assistance in full and timely.

### REFERENCES

- [1] Lutsenko VD, Shutov VI, Zamulin OA et al. Surg News 2013;5:107-110).
- [2] Divya GM, Hameed AS, Ramachandran K, Vinayak KV. Int J Head Neck Surg 2013;4(2): 98-101.
- [3] Al Muhanna A, Abu Chra KA, Dashti H, Behbehani A, Al-Naqeeb N. J Laryngol Otol 1990;104(6): 511-2.
- [4] Zohra T, Ikram M, Iqbal M, Akhtar S, Abbas SA. J Ayub Med Coll Abbottabad 2006;18(3): 65-6.
- [5] Remsen K, Lawson W, Biller HF, Som ML. Ann Otol Rhinol Laryngol Suppl 1983;105: 32-44.
- [6] Hohman MH, Harsha WJ, Peterson KL. Ann Otol Rhinol Laryngol 2010;119(2): 93-8.
- [7] Goh YH, Tan NG. J Laryngol Otol 1999;113(8): 769-71.
- [8] Chee LW, Sethi DS. Ann Otol Rhinol Laryngol 1999;108(2):177-180.
- [9] Yu-Hsing Lin, Hsu-Cheuh Ho, Shih-Hsuan Hsiao. Tzu Chi Med J 2006;18:438-441.
- [10] Kotecha JK. Int J Head Neck Surg 2014;5(1): 42-44.
- [11] Bobrov VM, Shushkov PV, Bydanov VA. Bull Otorhinolaryngol 2006;6: 78-79.
- [12] Babiyak VI, Govorun MI, Nakatis Ya A, Pashchinin AN. 2012. Otorhinolaryngology. College textbook. St. Petersburg. Piter: 640.
- [13] Kubarko AI, Yamashita S, Denisov SD et al., 1998. Thyroid gland. Under the editorship of Prof. A.I. Kubarko and Prof. S. Yamashita. Minsk – Nagasaki: 13-14