Globus Sensation

Pharyngoesophageal Function, Psychometric and Psychiatric Findings, and Follow-up in 88 Patients

Gabriele Moser, MD; Thalia-Anthi Wenzel-Abatzi, MD; Monika Stelzeneder, MD; Thomas Wenzel, MD; Ute Weber; Stefan Wiesnagrotzki, MD; Christa Schneider; Wolfgang Schima, MD; Giselheid Stacher-Janotta; Gerda Viktoria Vacaru-Granser, MD; Peter Pokieser, MD; Helmar Bergmann, PhD; Georg Stacher, MD

Background: The globus sensation has been widely regarded as psychogenic, but organic disorders were found to be etiologically significant.

Objective: To investigate the structural, functional, psychological, and psychiatric factors possibly eliciting the globus sensation and influencing its course.

Methods: Eighty-eight patients, 67 women and 21 men (aged 22-71 years), referred to 2 tertiary care centers underwent history taking, otolaryngological examination, pharyngoesophageal videofluoroscopy and manometry, psychosocial evaluation, psychiatric tests, psychiatric interview, and when indicated, esophagogastroduodenoscopy, esophageal bolus transport, gastroesophageal reflux, and gastric emptying studies. According to revealed disorders, therapy was initiated, and the outcome was studied.

Results: Only 15 patients had normal pharyngoesophageal function; of these 15, 6 had chronic tonsillitis or pharyngitis, 3 had thyroid adenomata, 4 had cervical spondylosis, and 1 each had dry oropharyngeal mucosa and chronic bronchitis. Of the other 73 patients, 2 had pharyngeal dysfunction, 24 had achalasia, 1 had diffuse esophageal spasms, 3 had “nutcracker esophagus,” 30 had non-specific esophageal motor disorders, and 13 had gastroesophageal reflux. Psychometry revealed no more anxiety and depression than in general medical outpatients. Of 58 patients interviewed, 37 met criteria for psychiatric disorders. Psychometric scores and psychiatric characteristics were unrelated to the sensation’s course. Therapy was recommended, but only 26 patients were treated accordingly; 22 received nonspecific treatment. Follow-up 3 to 59 months later revealed that the sensation had vanished in 13 patients who had received specific treatment, 5 who had received nonspecific treatment, and 6 who had received no treatment; it was alleviated in 10 who had received specific treatment, 13 who had received nonspecific treatment, and 9 who had received no treatment; and it was unchanged in 3 who had received specific treatment, 5 who had received nonspecific treatment, and 23 patients who had received no treatment.

Conclusions: Pharyngoesophageal disorders may be sensed only vaguely, inducing the globus sensation. Psychological and psychiatric characteristics could be relevant to the discomfort experienced but are unlikely to be etiologically significant.

Arch Intern Med. 1998;158:1365-1373

The GLOBUS sensation, a feeling of a lump in the throat associated with dry swallowing and disappearing while eating or drinking, has been widely regarded as psychogenic. It was thought to be a “materialization of a repressed idea,” one of the most widely recognized indications of nervous illness, a physical manifestation of suppressed emotion, a “discriminant symptom of somatization disorder,” or a “single-symptom model for the study of conversion disorders.” The last proposition was based on no more than higher neuroticism and lower extraversion scores on the Eysenck Personality Inventory in 37 women with globus sensation compared with 24 normal control subjects. The same group of authors later reported to have found significantly higher neuroticism scores on the Eysenck Personality Inventory and significantly higher ratings of anxiety, obsessionality, depression, phobia, and somatic concern in 28 women with the sensation than in 33 without it. Other authors found patients with the sensation to have no more anxiety and hysterical traits than healthy subjects and outpatients with otolaryngological disorders.

A series of studies indicated that organic factors underlay the symptom: a collapse in the vertical dimension of the masticating apparatus, temporomandibular joint dysfunction, carcinoma on the base...
PATIENTS AND METHODS

PATIENTS

Of 168 patients with globus sensation referred within 3 1/2 years to the Psychosomatic Clinic and the Psychophysiology Unit of the University of Vienna’s School of Medicine, Austria, for further investigation, 88 agreed to participate in the study. Sixty-seven were women, and 21 were men; their ages ranged from 22 to 71 years (median, 43 years). The sensation had been felt for 1 month to 36 years (median, 2 years). Before its initiation, the study had been approved by the institutional Committee on Studies Involving Human Beings.

ASSESSMENTS

At the initial evaluation, a detailed history accounting also for psychosocial conditions was obtained, and blood specimens were taken for hematologic and biochemical screening. To assess feelings of depression and anxiety, the patients were asked to complete the Beck Depression Inventory (BDI)40 and the Spielberger State-Trait Anxiety Inventory (STAI).41 Appointments were made for an otolaryngological examination, videofluoroscopic and manometric evaluations of pharyngoesophageal function, and a psychiatric interview. Endoscopic examinations; quantitations of esophageal bolus transport, gastric emptying, and GER; and other investigations were carried out as deemed appropriate by findings or symptoms.

Before manometry, the patients underwent an interview and answered a questionnaire directed at symptoms of dysphagia, heartburn, retrosternal and epigastric pain, postprandial fullness, regurgitation, vomiting, bloating, and bowel habits. To determine personality traits, the patients completed the Minnesota Multiphasic Personality Inventory (MMPI) in its 221-item form.42 Individual raw scores were converted to T-scale scores.

Psychiatric Interview

To examine whether criteria for any of the conditions listed in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R)43 were met, the patients were asked to undergo the Structured Clinical Interview for DSM-III-R disorders.44

Otolaryngological Examination

The otolaryngological examination comprised palpation and sonography of the neck and an inspection of the pharynx and larynx using a flexible endoscope.

Videofluoroscopic Evaluation

The videofluoroscopic procedure followed was as described earlier.45,46 In the oral phase of swallowing, attention was paid to bolus control and transport. In the pharyngeal phase, elevation of the hyoid and larynx, laryngeal closure, pharyngeal contractile activity, and the LES opening were evaluated. The presence of esophageal diverticula or webs and spinal osteophytes was noted. Achalasia was diagnosed when there were slow esophageal bolus transport, nonpropulsive contractions, and an incomplete or absent LES opening with or without esophageal dilatation. Diffuse esophageal spasm was diagnosed when there were intermittent, repetitive, and nonpropulsive contractions leading to a corkscrew appearance of the esophagus.

Manometric Investigation

For the manometric investigation, patients were placed in the supine position with their head on a pillow. In 36 patients, a probe with 3 strain-gauge pressure sensors spaced at 5-cm intervals and oriented radially 120° apart (Konigsberg Instruments Inc, Pasadena, Calif) was used, the output of which was recorded (R-411 Dynograph, Sensormedics Inc, Anaheim, Calif) and digitized on-line. In 24 patients, a probe with 3 strain-gauge pressure sensors spaced at 3-cm intervals (Konigsberg Instruments Inc) was used. The most distal sensor was circular, and the remaining 4 were oriented 90° apart; their output was recorded using a computer-based system (Synectics Medical AB, Stockholm, Sweden). The initiation of swallowing was monitored by a

of the tongue,15 hyperplastic lingual16,17 and pharyngeal tonsils,19 cervical lymph nodes,19 postcricoid webs,22 goiter,17 thyroid tumors,18 cervical osteophytes17,19 or arthritis,20 and an increased tension of the pharyngeal muscles.16 Paraesophageal masses,18 carcinoma,21 gastrointestinal lesions,17 and hiatal hernias17,22,23 also have been thought to underlie the sensation. In the past decades, a disordered contractile activity of the upper esophageal sphincter (UES),11,12,17,24-26 esophageal body,27,29 or the lower esophageal sphincter (LES)17,20,28,29 and gastroesophageal reflux (GER)11,12,18,23,28,31-39 were suggested to elicit the globus sensation.

The present study was carried out to determine the structural or functional abnormalities in the pharynx, larynx, esophagus, stomach, neck, and vertebral column as well as psychological traits and psychiatric disorders possibly related to the globus sensation and its course after diagnostic and therapeutic approaches.

RESULTS

The hematologic, biochemical, and urine analyses showed no gross abnormalities in any patient. Otolaryngological, fluoroscopic, and manometric investigations were carried out in every patient; videofluoroscopy in 73 patients; esophagogastroduodenoscopy in 16 patients; and studies of bolus transport in 36 patients, 24-hour GER activity in 21 patients, and gastric emptying in 6 patients.

CHARACTERISTICS OF THE GLOBUS SENSATION

Twenty-seven patients described the globus sensation as more or less persistent, and 61 described it as intermittent. Twenty-two patients had felt it for less than 6 months, 13 for 7 months to 1 year, 40 for more than 1 to 5 years,
submental surface electromyogram. The resting pressure and relaxation of the LES on swallowing 5 mL of water at body temperature were determined, with the mean end-expiratory fundic pressure as zero reference, drawing the probe at 5-mm steps and 30-second intervals. To evaluate the contractile responses of the esophageal body to 5-mL swallows, the probe was withdrawn at 1-cm steps and 30-second intervals. The UES resting pressure, the onset and duration of relaxation in response to 5-mL swallows, its coordination with pharyngeal contractions, the residual pressure at maximal relaxation, and the amplitude and duration of the postrelaxation contraction were determined by drawing the probe at 5-mm steps and 30-second intervals.

In 28 patients, manometry was performed using a pneumohydraulic system (Mui Scientific Enterprises Inc, Mississauga, Ontario) and a multilumen catheter fitted with a sensor (Dentsleeve, Pty Ltd, Bowden, South Australia) for measuring with the LES and side-hole openings 0, 3, 6, and 9 cm orad the sleeve’s proximal border (Arndorfer Medical Specialties Inc, Greendale, Wis), as described earlier.47

The criteria for achalasia were an LES relaxation on swallowing of less than 75% from a resting pressure of 18 mm Hg and predominantly synchronous swallow-initiated contractions in at least the lower two thirds of the esophageal body. Diffuse esophageal spasm was diagnosed when there were, in conjunction with retrosternal pain, contraction amplitudes of more than 190 mm Hg and durations of longer than 7.5 seconds in association with either or both synchronous and repetitive contractions following 30% or more of swallows in the lower esophagus. “Nutcracker esophagus” was diagnosed when the mean amplitude of contractions exceeded 190 mm Hg, but propagation velocity and LES resting pressure and relaxation were normal. A nonspecific esophageal motor disorder was diagnosed in the presence of abnormalities not fulfilling the criteria for the above disorders, ie, more than 20% of non-transmitted, triple-peaked, retrograde, or long-duration (>6 seconds) contractions; more than 10% of synchronous contractions; or an LES relaxation of less than 75% from a resting pressure of less than 18 mm Hg.

Esophageal Bolus Transport

Esophageal bolus transport was recorded scintigraphically.6 Achalasia was diagnosed when 95% of the bolus was transported through the esophagus in 20 seconds or more. Transit times of 10 to 19 seconds were considered to indicate disordered motility and of less than 10 seconds were considered normal.

Gastroesophageal Reflux

Gastroesophageal reflux was recorded by ambulatory 24-hour pH monitoring. Antimony or glass electrodes and fitting recorders (Synectics; Ingold, Messtechnik AG, Urdorf, Switzerland) were used. Percentages of time with a pH of less than 4 for more than 6.3% in the upright position, more than 1.2% in the supine position, and more than 4.2% of the total recording time were considered abnormal.

Gastric Emptying

The emptying of a semisolid standard meal was recorded scintigraphically.6 The residual radioactivity in the stomach 5 minutes postprandially was taken as an overall measure of emptying. The recorded data were compared with those of 55 healthy, symptom-free subjects (aged 19-64 years; median, 25 years) (mean ±SD residual radioactivity, 54.0% ±13.3%).

Esophagogastroduodenoscopy

Patients were asked to undergo esophagogastroduodenoscopy if there was an indication for pathological GER or a structural abnormality.

Follow-up Investigations

Patients were invited to return every 3 months for questionnaire-based interviews and, if indicated, further investigations. If patients were unable to return, interviews were carried out by telephone.

and 13 for more than 5 years. Twenty-five patients said that it arose or became more intense during states of fear, tension, anger, or mental stress; and 7 said that it occurred with general strains. Twelve patients said that the sensation arose during or after eating, after lying down (10 patients), when bowing down (5 patients), with regurgitation (1 patient), with dry throat or in smoky air (2 patients), with cervical pain (1 patient), with reading or watching television (6 patients), when walking downhill (1 patient), with mucus in the throat (2 patients), and after taking an antidepressant medication (1 patient). The sensation was felt less intense during states of relaxation (19 patients), during work or distraction (13 patients), during eating or drinking (7 patients), when upright or supine (6 and 3 patients, respectively), and when free of rhinitis (1 patient). In 7 patients, the sensation vanished after burping or clearing the throat, and in 3 patients, it vanished with moving the head.

Twenty-two patients thought that conflicts in their private or professional lives (or both) underlay their globus sensation, while 26 patients believed that conflicts and organic disorders and 23 patients believed that only organic disorders underlay their globus sensation; 17 patients had no explanation.

PSYCHOMETRIC FINDINGS

The 82 patients who completed the BDI showed the same depression scores as 80 consecutive general outpatients at a gastroenterology clinic (Table 1). Fifty-five patients with the globus sensation vs 49 of the control group had no signs of depression (scores <11), 19 vs 26 had signs of mild depression (scores, 11-19), 5 vs 3 had signs of moderate depression (scores, 20-25), and 3 vs 5 had signs of severe depression (scores ≥26). The 79 patients who completed the STAI scored only
slightly higher for anxiety as a state and a personality trait than 83 outpatients at a gastroenterology clinic. On the MMPI, which was completed by 63 patients, 10 scored high (70) on 1 or more of the scales, but none of the mean scores was higher than 70. The mean scores were slightly lower than in about 50,000 medical outpatients. The scores on the psychometric tests bore no relationship to the characteristics and duration of the globus sensation.

The patients who completed the BDI and STAI 4 to 10 months later scored markedly lower on these tests than at the initial evaluation (Table 2). There was no relationship, however, between either the score differences or the original scores and the globus sensation.

### PSYCHIATRIC FINDINGS

Of the 39 female and 19 male patients interviewed, 24 (62%) and 13 (68%), respectively, met criteria for at least 1 of the disorders listed in the DSM-III-R. Nineteen patients met criteria for more than 1 disorder (Table 3). Except for 3 subjects, none had been in psychiatric care previously.

---

**Table 1. Psychometric Scores of Patients With Globus Sensation and of Controls on the Beck Depression Inventory (BDI), the State-Trait Anxiety Inventory (STAI), and the Minnesota Multiphasic Personality Inventory (MMPI)*

<table>
<thead>
<tr>
<th>Questionnaire and Dimension</th>
<th>Patients With Globus Sensation</th>
<th>Control Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI Depression</td>
<td>9.4 ± 7.3</td>
<td>9.6 ± 9.3</td>
</tr>
<tr>
<td>STAI State anxiety</td>
<td>44.0 ± 10.7</td>
<td>41.6 ± 10.7</td>
</tr>
<tr>
<td>STAI Trait anxiety</td>
<td>41.8 ± 10.7</td>
<td>39.3 ± 11.6</td>
</tr>
<tr>
<td>MMPI Hypochondriasis</td>
<td>61.3 ± 10.0</td>
<td>61.4 ± 12.3</td>
</tr>
<tr>
<td>Depression</td>
<td>52.3 ± 8.2</td>
<td>60.2 ± 12.2</td>
</tr>
<tr>
<td>Conversion hysteria</td>
<td>59.8 ± 6.3</td>
<td>61.8 ± 10.6</td>
</tr>
<tr>
<td>Psychopathic deviate</td>
<td>52.4 ± 7.7</td>
<td>56.3 ± 10.5</td>
</tr>
<tr>
<td>Masculinity/femininity</td>
<td>53.6 ± 7.6</td>
<td>52.8 ± 9.6</td>
</tr>
<tr>
<td>Paranoia</td>
<td>51.3 ± 8.4</td>
<td>55.1 ± 8.1</td>
</tr>
<tr>
<td>Psychasthenia</td>
<td>53.2 ± 9.1</td>
<td>56.5 ± 10.6</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>54.2 ± 7.5</td>
<td>54.2 ± 10.2</td>
</tr>
<tr>
<td>Hypomania</td>
<td>49.4 ± 7.5</td>
<td>52.5 ± 10.0</td>
</tr>
<tr>
<td>Social introversion</td>
<td>50.5 ± 6.8</td>
<td>52.9 ± 9.0</td>
</tr>
</tbody>
</table>

*Data are given as mean ± SD.
†Eighty-two patients with globus sensation vs 80 consecutive general outpatients at a gastroenterology clinic.
‡Seventy-nine patients with globus sensation vs 83 consecutive general outpatients at a gastroenterology clinic.
§Sixty-three patients with globus sensation vs approximately 50,000 medical outpatients (from Swenson et al50).

**Table 2. Psychometric Scores of Patients in Whom Testing Was Done at Primary and Follow-up Assessments**

<table>
<thead>
<tr>
<th>Questionnaire* and Dimension</th>
<th>No. of Patients</th>
<th>Assessment, Mean ± SD</th>
<th>Paired t Test (df)† P</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI Depression</td>
<td>48</td>
<td>10.1 ± 7.1</td>
<td>7.7 ± 7.0</td>
</tr>
<tr>
<td>STAI State anxiety</td>
<td>47</td>
<td>44.1 ± 12.1</td>
<td>41.2 ± 12.1</td>
</tr>
<tr>
<td>STAI Trait anxiety</td>
<td>48</td>
<td>42.7 ± 10.0</td>
<td>39.2 ± 11.0</td>
</tr>
</tbody>
</table>

*BDI indicates Beck Depression Inventory; STAI, State-Trait Anxiety Inventory.
†Two-tailed.

**Table 3. Psychiatric Disorders Diagnosed in 58 Patients With Globus Sensation Having Undergone the Structured Clinical Interview for DSM-III-R**

<table>
<thead>
<tr>
<th>Diagnosis and Additional Diagnosis(es)</th>
<th>Current</th>
<th>Lifetime</th>
<th>Patients, No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood Disorders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>x</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Substance use disorder*</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Agoraphobia with panic disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Agoraphobia†</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undifferentiated somatoform disorder</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Simple phobia</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Panic disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Undifferentiated somatoform disorder</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>x</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Agoraphobia</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undifferentiated somatoform disorder</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bipolar I disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Anxiety Disorders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>x</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undifferentiated somatoform disorder</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Agoraphobia</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance use disorder†</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Substance use disorder‡</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Simple phobia</td>
<td>x</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance use disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agoraphobia</td>
<td>x</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder†</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Panic disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Agoraphobia</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Panic disorder</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance use disorder§</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Panic disorder</td>
<td>x</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Dysthymic disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Panic disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Obsessive-compulsive disorder</td>
<td>x</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Somatoform Disorders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undifferentiated disorder</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment Disorder</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Benzodiazepines.
†Alcohol.
‡Nonsteroidal anti-inflammatory drugs and caffeine.
§Cannabis.
Table 4. Disorders Diagnosed After Workup and Considered to Be of Primary Importance for the Globus Sensation (GS), Treatment of the Disorder, and Outcome

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Total Patients, No.</th>
<th>Treatment Specific</th>
<th>Treatment Nonspecific</th>
<th>Treatment None</th>
<th>Outcome GS Ceased</th>
<th>Outcome Alleviated</th>
<th>Outcome Unchanged</th>
<th>OutcomeUnavailable, No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic tonsillitis</td>
<td>2</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Chronic pharyngitis</td>
<td>4</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Dry oropharyngeal mucosa</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Thyroid adenoma</td>
<td>3</td>
<td>2</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td>1</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Cervical spondylosis</td>
<td>4</td>
<td>3</td>
<td>...</td>
<td>...</td>
<td>2</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Pharyngeal motor disorders</td>
<td>2</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Achalasia</td>
<td>24</td>
<td>6</td>
<td>...</td>
<td>...</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>...</td>
</tr>
<tr>
<td>Diffuse esophageal spasms</td>
<td>1</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>&quot;Nutcracker esophagus&quot;</td>
<td>3</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Nonspecific esophageal motor disorders</td>
<td>30</td>
<td>6</td>
<td>...</td>
<td>...</td>
<td>4</td>
<td>2</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Gastroesophageal reflux</td>
<td>13</td>
<td>7</td>
<td>...</td>
<td>...</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>...</td>
</tr>
</tbody>
</table>

*Ellipses indicate that no patient fit the category.

Of the 6 patients meeting criteria for a current major depressive disorder and the 1 meeting those for bipolar 1 disorder, 2 had signs of mild depression, 1 had signs of moderate depression, and 1 had signs of severe depression on the BDI. Of the 10 patients fulfilling the criteria for a past major depressive disorder and the 1 fulfilling those for past dysthymia, 2 had signs of mild depression, 3 of moderate depression, and 1 of severe depression on the BDI. The diagnoses “undifferentiated somatoform disorder” posed in 2 patients and “hypochondriasis” posed in 1 as the sole diagnosis are questionable because in all 3 patients, somatic disorders potentially explaining the symptoms were revealed.

Psychoactive drugs were recommended for 7 patients and psychotherapy for 6 patients, but only 4 and 1, respectively, were treated. The presence and type of psychiatric disorders bore no relationship to the characteristics of the globus sensation, the physical disorders detected, and the sensation’s course in the follow-up period.

**PHYSICAL, OTOLARYNGOLOGICAL, AND RADIOLOGICAL INVESTIGATIONS**

Abnormalities potentially related to the globus sensation, but no pharyngoesophageal motor disorders, were found in 15 patients. Two patients were found to have chronic tonsillitis, 4 chronic pharyngitis, 1 dry oropharyngeal mucosa, 1 chronic obstructive bronchitis, 2 cervical spondylosis, 1 cervicothoracic spondylosis and disordered masticatory function, and 1 cervical spondylosis and gastritis. Three patients had thyroid adenoma, of whom 1 also had sinusitis and cervical spondylosis. The first-mentioned abnormalities were considered as being of primary potential importance for the globus sensation (Table 4).

At reevaluation 3 to 56 months (median, 29 months) later, the globus sensation had vanished with specific therapy in 2 patients. In 3 patients, it had decreased in intensity and frequency with specific treatment, in 2 with nonspecific treatment, and in 2 with no therapy. The sensation was unchanged in 2 patients after specific treatment and in 4 after no treatment (Table 4).

**MANOMETRIC, VIDEOFLUOROSCOPIC, SCINTIGRAPHIC, AND pH MONITORING INVESTIGATIONS**

Velum palatinum insufficiency and disordered pharyngeal motility were observed videofluoroscopically in 1 patient, who also had pharyngitis and gastritis. No therapeutic steps were taken, and the globus sensation was unchanged 16 months later. In another patient, the UES opened at videofluoroscopy only 70% with swallowing; with the use of cisapride medication for epigastric fullness, the globus sensation ceased.

Twenty-four patients were revealed manometrically to have achalasia (for criteria, see the “Manometric Investigation” subsection in the “Patients and Methods” section). Scintigraphically, esophageal bolus transport was slow in 12 patients (10 to >120 seconds; median, 28.5 seconds) and in the upper range of normal (9 seconds) in 3 patients; on videofluoroscopy, barium passage was slow in 8 patients.

At the primary evaluation, none of the 24 patients had reported dysphagia. After the diagnosis was made, 21 volunteered at least 1 sign suggestive of achalasia. Of these, 1 now admitted to sometimes regurgitate saliva or food and to wake up from sleep because of aspirating saliva. Another reported that she ate only soft food and drank after every bite because this was the only way to finish a meal within a reasonable time. Two reported waking up...
every morning with the pillow wet from saliva, often having odynophagia, and occasionally having regurgitation. One volunteered that she woke up in the night because of aspirated saliva and that her pillow was wet from saliva in the morning; occasionally more solid food got stuck in her gullet. Another reported that she always felt a retrosternal pressure, which she ascribed to her spondylosis; because of the large amounts of saliva regurgitated postprandially, she feared that she had a serious disease. One patient from time to time had retrosternal pain and dysphagia for solids, which she attributed to her goiter. After the diagnosis of achalasia was made, 2 said they had "gastric cramps" and 1 admitted to having epigastric pain that ceased after self-induced vomiting; the regurgitated food always tasted like the food previously eaten. Another patient disclosed that she could avoid the globus sensation if she chose not to lie down after supper.

One patient described regurgitating huge amounts of saliva, and 2 patients sometimes regurgitated ingesta that tasted like the food previously eaten; with these 2 patients, neither the "gastric cramps" nor the epigastric pain ceased after self-induced vomiting. Three patients sometimes had difficulties with swallowing more solid food and regurgitated saliva. A patient in whom an esophageal Candida albicans infection was revealed admitted that more solid food sometimes got stuck in his esophagus. Another reported that with swallowing, his globus sensation often became so painful that it brought tears to his eyes.

F or treatment, slowly releasing forms of calcium channel blockers or nitroglycerin or pneumatic dilatation of the achalasic LES were recommended to the patients' physicians. Only 6 patients, however, received specific treatment or advice directed at changing their eating or postprandial behavior (Table 4).

Twenty-three of the 24 patients could be reinvestigated 18 to 59 months (median, 38 months) later (Table 4). With the intake of a calcium channel blocker, the globus sensation had disappeared in 2 patients, decreased in intensity in 3 patients (in 1 of them the medication had to be discontinued because of adverse effects), and remained unchanged in 1 patient. In 3 patients, the sensation ceased without therapy. In 1 patient, the sensation had become less intense after she had started to go for a walk after each meal; in 1 patient, it had become less intense with supportive psychotherapy, benzodiazepine medication, and relaxation training; in 1 patient it had decreased with slow eating and the avoidance of carbonated beverages; in 1 patient with slow eating and relaxation training; in 1 patient with the use of a tricyclic antidepressant; in 1 patient with an antacid and relaxation training; in 1 patient with thyrostatic therapy and physiotherapy for cervical spondylosis; and in 4 patients without therapy. One of the last patients had ended a stressful personal relationship and found a new partner; another patient, who at the primary assessment had suffered physical abuse by her husband, had attained a better marital relationship and a position in public life. The sensation was unchanged in 4 untreated patients.

**Diffuse esophageal spasms** were revealed manometrically in 1 patient, who on 24-hour pH monitoring had an abnormal GER. After these investigations, the patient admitted to having retrosternal pain when eating more solid food and to having heartburn postprandially. A histamine-2 (H2) receptor antagonist and a calcium channel blocker were recommended. Because of adverse effects, the latter was taken for only 2 days; relaxation training yielded no alleviation. Twelve months later, the symptoms were unchanged.

**Nutcracker esophagus** was found manometrically in 3 patients. Thereafter, 1 patient admitted to having dysphagia for more solid food and salivary regurgitation. The use of a calcium channel blocker was recommended for 2 patients, but none was treated; 28 to 52 months later, their globus sensation was unchanged (Table 4). The third patient was treated with an antidepressant medication, and the sensation was unchanged at 28 months.

**Nonspecific esophageal motor disorders** were found manometrically in 30 patients; videofluoroscopy carried out in 27 patients showed slow transport or proximal escape (or both) of barium in 18 patients and only partial UES opening on swallowing in 1 patient. Bolus transport was delayed (10-93 seconds; median, 16 seconds) in 13 of 19 patients studied. In 4 patients, whose symptoms were suggestive of GER and of whom 1 had grade 1 esophagitis, 24-hour pH monitoring was carried out, but no pathological reflux was found. After these investigations, 1 patient admitted to occasionally having the impression that food did not "go down" properly and to having heartburn and saliva and food regurgitation; her contraction amplitudes reached 277 mm Hg with durations of 13 seconds. A patient with high-amplitude contractions reported having dysphagia; 3 patients with partly synchronous double-peak contractions had no dysphagia, but 1 of them regurgitated saliva. One patient, who had a midesophageal high-pressure zone not relaxing on swallowing, reported postprandial epigastric fullness and heartburn. According to the findings, therapeutic measures, including a calcium channel blocker for 1 patient and a trial of antireflux therapy for 4 patients, were recommended, but only 6 patients were treated accordingly.

At reevaluation 5 to 58 months (median, 22 months) later, the globus sensation had vanished in 9 patients. This had occurred with the use of cisapride (1 patient), cisapride and a tricyclic antidepressant medication (1 patient), an antidepressant medication (1 patient), a calcium channel blocker (1 patient), and a thyrostatic medication (1 patient); 1 patient had stopped to "clean" her throat with cotton swabs, a procedure recommended by a general practitioner as a remedy against her chronic tonsillitis, and 1 patient had ceased to work with detergents; in 1 patient, the sensation had vanished with manometry, and in another patient, it had vanished after chronic bronchitis resolved. The sensation had become less frequent in 8 patients with the use of cisapride (1 patient), infiltration therapy of the cervical muscles (1 patient), cisapride and an H2-receptor antagonist (1 patient), an H2 antagonist (1 patient), a tricyclic antidepressant and relaxation training (1 patient), abstaining from coffee and carbonated beverages (1 patient), a cure
for chronic bronchitis and relaxation training (1 patient), physical therapy of the neck (1 patient), and no treatment (1 patient). The sensation was unchanged in 13 patients, 8 of whom had received no treatment; 1 had taken cisapride, sucralfate, and a tricyclic antidepressant; 1 had practiced relaxation training; and 1 had received acupuncture treatment. Two patients who had received no treatment felt the sensation was unchanged; however, they were less worried because they felt assured that there was no underlying serious condition.

Pathological GER was revealed in 14 patients; all had heartburn, 8 had acid regurgitation, 3 had dysphagia, and 6 had odynophagia. One also had diffuse esophageal spasms (this patient is described earlier under that category). Esophagitis was found in 6 patients and gastritis in 4 patients, 1 of whom also had cervical spondylosis. Videofluoroscopy revealed a distal esophageal stenosis in 4 patients, and scintigraphy showed a massively delayed gastric emptying in 2 patients.

Patients were seen for 4 to 42 months (median, 26 months). Three patients became symptom-free with the use of an H2 antagonist and cisapride; 1 patient with an H2 antagonist, a tricyclic antidepressant medication, and sucralfate; 1 patient with cisapride, an antacid, and abstaining from coffee; 1 patient with psychotherapy; and 1 patient without treatment. The sensation was alleviated by an H2 antagonist plus cisapride in 1 patient, by cisapride and domperidone in another patient, and after no treatment in 1 patient. It remained unchanged in 1 patient who took cisapride, 1 patient who took an antidepressant and received relaxation training, and 1 with no treatment (Table 4).

The results of the present investigation show that motor disorders, inflammatory conditions, and structural abnormalities of the pharynx and esophagus were associated with the globus sensation in most patients, which suggests that they were of significance for the occurrence of the sensation. That such relationships were not revealed to the same extent or did not receive attention in previous studies may have been due to an absence, or the patients' disregard, of dysphagia, odynophagia, regurgitation, and heartburn. Even in the present study, such symptoms were noted at renewed questioning in only 47 of the 73 patients in whom it had become obvious during the diagnostic workup that disorders of the above type were present. The gathered evidence, however, seems insufficient to infer a causal relationship between the organic disorders detected and the globus sensation, in particular because only some of the patients received the recommended specific treatment and responded favorably to it.

An explanation of why, at the primary assessment, the patients complained of globus sensation but not of dysphagia, retrosternal pain, or heartburn may be provided by studies showing that one third of patients with an obstruction at the lower end of the esophagus pointed to the throat when asked where they felt the obstruction.22,51 In 1924, Jacobson26 reported that a patient had the globus sensation while barium paste was held in his esophagus and “moderate spasm” was observed fluoroscopically. More recently, it was found that the sensation could be elicited by balloon distension in the middle and proximal esophagus.26 This suggests that, in many patients, the globus sensation can yield no more than misleading information on the location of an underlying disorder.

A possible etiologic importance of esophageal motor disorders for the globus sensation also has been suggested earlier. In a study28 of 18 patients with the sensation, 2 were found to have diffuse spasms and 2 to have nonspecific esophageal motor disorders. An impaired esophageal clearance in the horizontal position was found on radiography in a third of more than 300 patients with globus sensation and dysphagia.25 No increased incidence of abnormal esophageal motility was found by others.56,57

Most striking in the present study was the high number of patients in whom achalasia was revealed manometrically. This may be due more to the lack of dysphagia and esophageal dilatation in most patients than to the fact that this disorder is still widely underdiagnosed. It has been reported, however, that early stages of achalasia may not, or only intermittently,52,53 cause dysphagia and that even patients with megaeosophagus may remain symptom-free.50 Food and saliva residing in the esophagus could explain the occurrence of the globus sensation mainly between meals and not during the distracting act of eating. Furthermore, during eating, food may reach the stomach unhampered because of gravity and the pharyngeal pump. The fact that in 59 patients in this study local transducers were used to evaluate LES function instead of the sleeve technique46 does not mean that the diagnoses, or nondiagnoses, of achalasia are questionable. Whereas a swallow-related axial movement of the esophagus over the probe may suggest sphincter relaxation in instances in which the sensor in fact records from the gastric or esophageal lumen, an incomplete or lack of relaxation cannot be simulated by axial movement.

The low incidence of structural and functional abnormalities of the pharynx and UES encountered is consonant with earlier reports of no11,12,28,61 or only doubtful57 abnormal features in these locations. Our finding that 14 of the 88 patients had pathological GER is in accordance with reports of others26,62 who also noted GER in patients with the globus sensation. Thus, an increased esophageal acid exposure has to be considered as underlying the sensation in some of the patients. Further studies have to be done to see whether a more effective therapeutic approach than one used by us, ie, the prescription of proton-pump inhibitors, would render a greater proportion of patients with GER free of the globus sensation.

Patients who accept a referral to a psychosomatically oriented institution may show more abnormal personality traits than general medical patients, but no such tendency was observed in these patients. Their BDI and STAI scores were no more indicative of depression and anxiety than were the scores of patients attending a general gastroenterologic clinic, and their scores on the MMPI were in the same range as those of a large group of medical outpatients.50 These findings are at variance with re-
ports that patients with the globus sensation had high levels of depression\textsuperscript{63} and, on the Crown-Crisp Experi-
tential Index, higher scores for anxiety, obsessionality, depression, phobia, and somatic concern\textsuperscript{7} than symptom-
free persons. Earlier it had been reported\textsuperscript{10} that women with the sensation had high scores for anxiety, depression, and somatic concern\textsuperscript{7} and did not differ on the
Crown-Crisp Experiential Index from psychiatric out-
patients, whereas men had scores similar to those of sub-
jects with no psychiatric symptoms. In one article,\textsuperscript{64} it was stated that patients with the globus sensation had “markedly” higher-than-average scores for hypochon-
driasis and depression on the MMPI and in another\textsuperscript{65} that 7 patients with the sensation had more state and trait anxi-
ety on the STAI and more depression on the BDI than 13 healthy students.

Another striking finding of the present study was the
high incidence of psychiatric disorders, either active or in
remission. Again, this may be related to the fact that our patients were referred to psychosomatically oriented in-
tstitutions, which may reflect the suspicion of the refer-
ring physicians that psychological factors played a part in the patients’ symptom. There were no indications for re-
lationships between the diagnosed psychiatric disorders and the development of the globus sensation or the physi-
cial disorders that were revealed. Similarly, Clouse and Lust-
man\textsuperscript{66} were unable to differentiate, using a multidimen-
sional psychometric inventory, subjects with esophageal contraction abnormalities from those without. A high life-
time prevalence of psychiatric disorders, ie, 71%, was found in 114 diabetic patients with a mean illness duration of
12.4 years.\textsuperscript{57} High prevalence rates found also in other pa-
tients with long-standing diabetes mellitus\textsuperscript{68,69} and chronic pain\textsuperscript{70,71} suggest that psychiatric disorders are related to chronic suffering and incertitude rather than to specific symptoms. One explanation for the high number of psy-
chiatric disorders diagnosed may be the item “Have you ever had trouble swallowing?” that is included in the so-
matization section of the Structured Clinical Interview for
the DSM-III-R and the items “Did you feel as if you were
choking?” and “Do you often have trouble swallowing or get a lump in your throat?” in the panic disorder and general-
ized anxiety disorder sections, respectively. In a study\textsuperscript{72} of 24 patients with globus sensation, however, it was found
that 8 patients had had panic attacks in the past and that 6 met DSM-III-R criteria for panic disorder. Panic attacks
could, as suggested earlier,\textsuperscript{73} result from a basic disorder combined with a fearful attitude to visceral sensations. By
contrast, there seems to be no basis for the suggestion that “globus hystericus reflects anxiety with a choking sensa-
tion or difficulty in swallowing.”\textsuperscript{74} Although patients may have the sensation in association with emotional up-
heaval, the presumption that the sensation is always attribu-
table to emotional or mental origins is unjustified.

CONCLUSION

The high incidence of esophageal motor abnormalities in the studied patients suggests, together with results of previous investigations,\textsuperscript{52,53} that such disorders may, instead of eliciting dysphagia, be sensed only vaguely and elicit the globus sensation. Psychological characteris-
tics, stress, and psychiatric disorders may be relevant for the discomfort experienced but not the sensation’s or-
igin and course. A diagnostic workup of patients with the globus sensation should start with a thorough his-
tory taking and a physical and otolaryngological examina-
tion. If these are unrevealing, a preferably video-
cinematographic, radiological, and a manometric investigation of pharyngoesophageal motility as well as a
pH-monitoring study of gastroesophageal reflux activity
should be carried out, even if no symptoms of dys-
phagia or reflux are volunteered.

Accepted for publication November 4, 1997.

From the Psychophysiology Unit, Department of Sur-
gery (Dr Stelzender, Vacariu-Granser, and Stacher and Mss Web,
Schneider, and Stacher-Janotta), Psychosomatic
Clinic, Division of Social Psychiatry and Evaluation Research
(Drs Wenzel-Abatz and Wenzel) and General Psychiatry
(Dr Wiesnagrotzki), the Department of Psychiatry; and
the Departments of Radiology (Drs Schima and Pokieser)
and Biomedical Engineering and Medical Physics (Dr Berg-
mann), University of Vienna School of Medicine; and the
Ludwig Boltzmann Institute of Nuclear Medicine (Dr Berg-
mann), Vienna, Austria.

This study was supported by the Austrian Science Foun-
dation, Vienna (project P7359-MED).

Corresponding author: Georg Stacher, MD, Psychophys-
ology Unit, Währinger Gürtel 18-20, A-1090 Wien, Austria.

REFERENCES

1. Ferenczi S. Hysterische Materialisierungsphänome:
Gedanken zur Auffassung der hysterischen Konversion und Symbolik. In: Bausteine zur Psychoanalyse, Band
2. Weiss E, English OS. Psychosomatic Medicine. 2nd ed. New York, NY: WW Nor-
ton & Co Inc; 1949.
153:335-339.
6. Eysenck HJ, Eysenck SBG. Manual of the Eysenck Personality Questionnaire. Lon-
7. Deary LJ, Wilson JA, Kelly SW. Globus pharyngis, personality, and psychologi-
8. Lehtinen V, Puukka H. A psychosomatic approach to the globus hystericus syn-
10. Deary LJ, Wilson JA, Mitchell L, Marshall T. Covert psychiatric disturbance in pa-
227-230.
108-113.
15. Tremble GE. The clinical significance of a lump in the throat. Arch Otolaryng-
ology. 1959;70:157-165.
16. Gray LP. The relationship of the “inferior constrictor swallow” and “globus hys-
17. Malcomson KG. Globus hystericus vel pharyngis (a reconnexion of prox-
18. Ravich WJ, Wilson RS, Jones B, Donner MW. Psychogenic dysphagia and glo- 
19. Maran A, Jacobson I. Cervical osteophytes presenting with pharyngeal symp-
20. Breuninger H. Zur Differentialdiagnose: chronische Pharyngitis, Globusgefühl, 
21. Nishiijima W, Takoda S, Hasegawa M. Occult gastrointestinal tract lesions asso-
24. Watson WC, Sullivan SN. Hypertonicity of the cricopharyngeal sphincter: a cause 
25. Ullrich de Muynck R, Ullrich R. Das Asservierungstraining-Programm ATP: 
Einrichtung von Selbstvertrauen und sozialer Kompetenz. Part I. München, 
Germany: J Pfeiffer Verlag; 1976.
26. Pursnani KG, Mohiuddin MA, Gideon RM, Castell JA, Katzka DA, Castell DO. Is 
globus sensation secondary to hypertensive upper esophageal sphincter [ab-
28. Linsell JC, Anggiansah A, Owen WJ. Manometric findings in patients with the 
motor disorders in consecutive patients with globus sensation. Gastroenterol-
30. Färkkila MA, Ertama L, Katila H, Kuusi K, Pauvolaenen M, Varis K. Globus phar-
yngis, commonly associated with esophageal motility disorders, Am J Gastro-
31. Delahunt JE, Ardran GM. Globus hystericus: a manifestation of reflux oesopa-
32. Mair IWS, Natvig K, Maurer H-J, Ødegaard HI. The globus symptom. J Otolri-
33. Freeland AP, Ardran GM, Emrys-Roberts E. Globus hystericus and reflux oesopha-
34. Mair IWS, Schroder KE, Modalsli B, Maurer HJ. Aetiological aspects of the glo-
36. Pratt LW, Tobin WH, Gallagher RA. Globus hystericus: office evaluation by psy-
chological testing with the MMPI. Laryngoscope. 1976;86:1540-1551.
37. Lindgren S, Janzon L. Prevalence of swallowing complaints and clinical findings 
among 50- to 79-year-old men and women in an urban population. Dysphagia. 
38. Stuart RC, McGrath JP, Hill J, et al. Gastro-oesophageal reflux and globus phar-
yngis, commonly associated with esophageal motility disorders. Am J Gastro-
39. Caton W, Egan K, Miller D. A new technique for continuous sphincter pressure measurement. Gastro-
40. Wilson JA, Heading RC, Maran AGD, Pryde A, Piris J, Allan PL. Globus sensa-
tion is not due to gastro-oesophageal reflux. Clin Otolaryngol. 1987;12: 
271-275.
41. Wilson JA, Pryde A, Piris J, et al. Pharyngoesophageal dysmotility in globus sen-
42. Merskey H, Meshkinpour H, Glick ME. Acharis: is it an intermittent manometric phenom-
1992;161:115-117.
46. Pratt LW, Tobin WH, Gallagher RA. Globus hystericus: office evaluation by psy-
chological testing with the MMPI. Laryngoscope. 1976;86:1540-1551.
47. Stacher G, Schima W, Bergmann H, et al. Sensitivity of radionuclide bolus trans-
port and videofluoroscopic studies compared with manometry in the detection 
48. Johnson LF, DeMeester TR. Twenty-four-hour pH monitoring of the distal esopha-
gus: a quantitative measure of gastroesophageal reflux. Am J Gastroenterol. 1974; 
62:325-332.
49. Stacher G, Peeters TL, Bergmann H, et al. Erythromycin effects on gastric emp-
tlying, antral motility and plasma motilin and pancreatic polypeptide concentra-
50. Swenson WM, Pearson JS, Osborne D. An MMPI Source Book: Basic Item, Scale, 
and Pattern Data on 50,000 Medical Patients. Minneapolis: University of Min-
51. Savary M, Miller G. Der Ösophagus: Lehrbuch und endoskopischer Atlas.Solo-
thurn, Switzerland: Verlag W Gassmann AG; 1977.
52. Edwards DAW, Lobello R. Site of referral of the sense of obstruction to swal-
53. Edwards DAW. The anti-reflux mechanism, its disorders and their conse-
54. Cook LJ, Shaker R, Doods WJ, Hogan WJ, Arndorfer RC. Role of mechanical and 
chemical stimulation of the esophagus in globus sensation [abstract]. Gastro-
Med. 1982;75:242-244.
56. Wilson JA, Heading RC, Maran AGD, Pryde A, Piris J, Allan PL. Globus sensa-
tion is not due to gastro-oesophageal reflux. Clin Otolaryngol. 1987;12: 
271-275.
57. Wilson JA, Pryde A, Piris J, et al. Pharyngoesophageal dysmotility in globus sen-
58. Popkin MK, Callies AL, Colon EA, Sutherland DE. Prevalence of major 
depression, single phobia, and other psychiatric disorders in patients with long-
standing type I diabetes mellitus. Arch Gen Psychiatry. 1988;45:64-68.
59. Deary IJ, Smart A, Wilson JA. Depression and “hassles” in globus pharyngis. Br J 
61. Dent J. A new technique for continuous sphincter pressure measurement. Gastro-
62. Katon W, Egan K, Miller D. Chronic pain: lifetime psychiatric diagnoses and fam-