Swallow syncope

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Swallowing is considered a rare cause of syncope. The five patients described in this report had a spectrum of gastrointestinal tract or cardiovascular disease. For each patient there was a clear association between swallowing and the onset of syncope. Prompt diagnosis of this potentially lethal condition is essential, and electrocardiographic monitoring during swallowing is advisable in all cases in which syncope is suspected.

La déglutition est reconnue comme une cause rare de syncope. On en décrit cinq cas chez des malades souffrant de diverses maladies du tube digestif ou du système cardiovasculaire. Chez chacun d'entre eux on établit un rapport net entre la déglutition et le début de la syncope. Dans l'intérêt du diagnostic précoce de cet état qui peut être mortel, il est à conseiller de pratiquer l'électrocardiographie pendant la déglutition dans tous les cas où l'on soupçonne une syncope.

Swallowing is rarely recognized as a cause of episodic loss of consciousness. In a recent review of 204 patients with syncope Kapoor and associates[1] found that in 25% the syncope was caused by cardiovascular disorders, in 25% it was caused by noncardiovascular disorders and in 50% it had no definable cause. There was no report of swallow syncope in any of the patients. In this paper we describe five patients with swallow syncope associated with gastrointestinal or cardiac abnormalities.

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Case reports

Patient 1

A 53-year-old woman was admitted to hospital with a common bile duct stone, which passed spontaneously. She had a 4-year history of occasional retrosternal discomfort that lasted 1 to 2 minutes and occurred only during swallowing, usually of cold or hot liquids; the episodes were accompanied by transient dysphagia, dyspnea and lightheadedness. On three occasions syncope, with loss of consciousness for several seconds, followed. Between episodes there were no esophageal or cardiac symptoms except for occasional heartburn, which was promptly relieved by antacids.

The patient had a 1/6 systolic ejection murmur and a slightly prolonged PR interval (0.22 seconds). Carotid sinus massage failed to produce symptoms or bradycardia. Radiologic examination of the upper gastrointestinal tract showed a hiatus hernia without reflux, and cineesophageal studies confirmed a normal swallowing mechanism.

During her stay in hospital the patient experienced syncope while drinking ice water. The syncope was associated with sinus bradycardia of 25 beats/min for 8 seconds, followed by a junctional rhythm of 50 beats/min for several more seconds before the resumption of normal sinus rhythm. The lightheadedness and syncope ceased following insertion of a demand transvenous ventricular pacemaker. Four years later she was still experiencing occasional retrosternal discomfort but without associated syncope.

Patient 2

A 67-year-old woman receiving long-term hospital care became pulseless and apneic while being fed. Cardiopulmonary resuscitation rapidly restored effective circulation and spontaneous respiration, and she was transferred to our coronary care unit. She had atrial fibrillation and a ventricular response of 100 beats/min. Shortly after admission she gagged while drinking, and her heart rate decreased. An idioventricular rhythm of 35 beats/min emerged and persisted for 30 seconds along with weakness and unresponsiveness (Fig. 1).

Three years previously she had had transient complete heart block during an inferior myocardial infarction, and subsequently she suffered chronic atrial fibrillation, congestive cardiac failure and stroke.

Because there was no evidence of digitalis intoxication or another reversible cause of the bradyarrhythmia a permanent demand ventricular pacemaker was inserted; its rate was 72 beats/min. The pacemaker relieved the symptoms and functioned well during swallowing. However, the patient died of unexplained respiratory arrest 1 week later. The pacemaker had been functioning normally at the time of the arrest.

Patient 3

A 58-year-old woman presented with an 8-year history of a "seizure disorder" that had been unresponsive to treatment with phenytoin. She had been having six to seven "lightheaded spells" a day but at times had no symptoms for as long as 2 months. However, there had

been a marked increase in the frequency of the spells before admission. Typically the spells occurred during or immediately after swallowing hot liquids.

During electrocardiographic monitoring in our unit the symptoms were reproduced and were accompanied by a 4.5-second period of asystole and complete atrioventricular block when the patient drank hot water (Fig. 2). The electrocardiogram (ECG) was otherwise normal, and carotid sinus massage revealed no abnormalities. Radiologic examination of the upper gastrointestinal tract and cine-esophageal studies yielded normal results.

A permanent demand ventricular pacemaker provided immediate relief of the patient's "spells". Esophageal manometry revealed normal motility both at rest and during swallowing. However, when the pacemaker was temporarily inhibited, swallowing produced typical lightheadedness not associated with any change in esophageal pressures. There were no symptoms 1 year later.

Patient 4

An 81-year-old woman presented with a 2-week history of syncopal episodes. Each of three attacks had occurred immediately after she had consumed hot tea or coffee. She had had several other near-syncopal episodes during swallowing, each preceded by a sensation of "something catching" in her throat. She also suffered from stable angina pectoris, hypertension and heart failure.

Electrocardiography revealed intermittent left bundle-branch block, left axis deviation and sinus bradycardia of 42 beats/min with junctional escape beats. The bradycardia was attributed to treatment with propranolol, so the drug was discontinued. Her sinus rate then increased to 60 beats/min, and the junctional rhythm disappeared. Another near-syncopal episode occurred during swallowing, but no change in heart rate or rhythm was evident on the ECG. Radiologic examination of the upper gastrointestinal tract revealed a small lateral web at the level of the fifth cervical vertebra, impressive tertiary contractions in the middle and lower esophagus, a hiatus hernia of moderate size without reflux, and spastic narrowing 4 cm above the gastroesophageal junction.

She was discharged from hospital but was readmitted 2 weeks later because she had two episodes of syncope while she was swallowing coffee. Carotid sinus massage induced gagging, and Valsalva's maneuver failed to produce syncope or bradyarrhythmia during monitoring. Despite the insertion of a permanent transvenous cardiac pacemaker, intermittent periods of syncope persisted, and she died of congestive heart failure 2 years later.

Patient 5

A 53-year-old man was admitted to hospital 3 days after suffering an

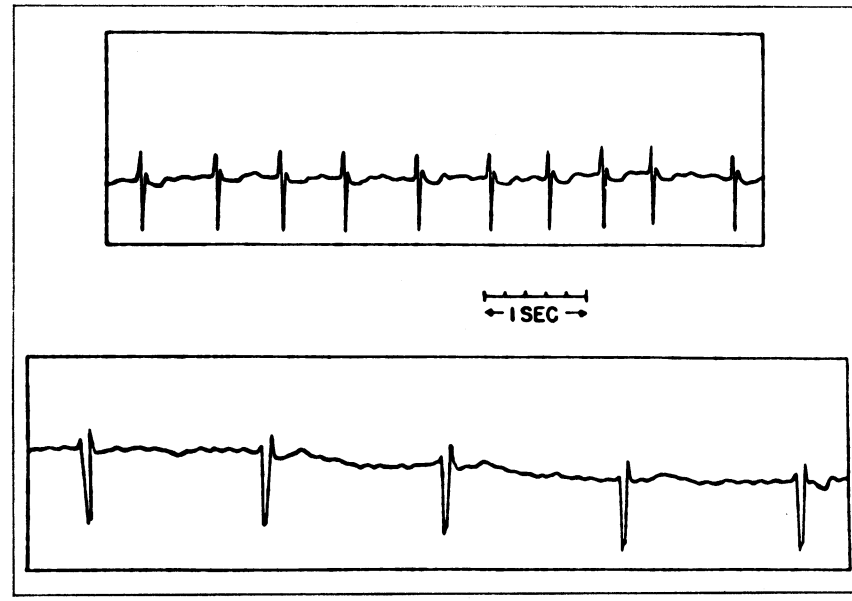

Fig. 1—Patient 2: Electrocardiograms (ECGs) showing atrial fibrillation with ventricular response of 100 beats/min (top) and slow idioventricular rhythm, 35 beats/min, associated with weakness and syncope during swallowing (bottom).

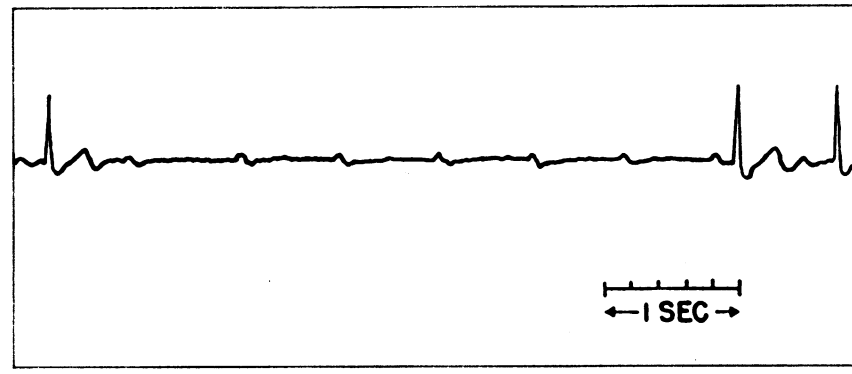

Fig. 2—Patient 3: ECG showing complete atrioventricular block with 4.5-second period of asystole while patient was drinking hot water.

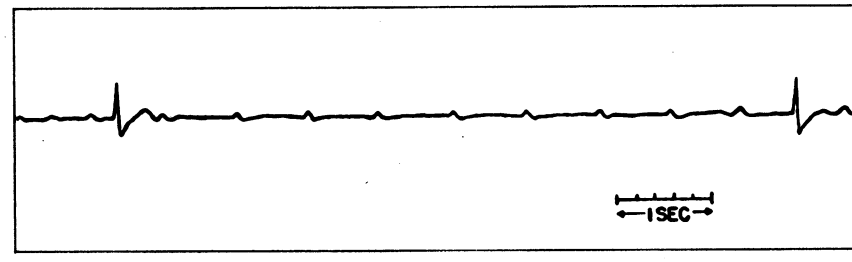

Fig. 3—Patient 5: ECG during near-syncope, showing 7 seconds of asystole and high-degree atrioventricular block, while patient was drinking ice water.

inferior myocardial infarction complicated by ventricular fibrillation and atrioventricular block. He had no history of upper gastrointestinal tract symptoms. His cardiac rhythm initially alternated between second-degree Wenckebach atrioventricular block and normal. Three hours after admission he felt like he was "fading away" when he swallowed ice water. Electrocardiography showed a high-degree atrioventricular block, with 7 seconds of asystole (Fig. 3).

A temporary cardiac pacemaker was inserted but was not needed for the next 3 days. During this time he had first-degree atrioventricular block and a PR interval of 0.24 seconds. The swallowing of ice water reproduced a transient 2:1 block that was asymptomatic. He subsequently had sinus rhythm with a PR interval of 0.16 seconds and experienced no further episodes of syncope while swallowing.

Discussion

Swallowing is a complex neuromuscular activity that depends on an interaction of many reflex activities. Since esophageal peristalsis is mainly dependent on vagal stimulation, any esophageal influence on cardiac rhythm is presumably vagal.[2] In humans rapid swallowing accelerates the heart rate, and in dogs stimulation of the superior laryngeal nerve produces cardiac deceleration and occasionally cardiac arrest.[3] Distention of the esophagus with an inflated balloon at the level of a midesophageal diverticulum in a patient with swallow syncope has been reported to produce transient complete atrioventricular block similar to that which occurred when the patient drank water.[4]

Only 29 cases of bradycardia-mediated syncope have been reported in the literature.[5-12] In Palmer's review of 22 patients 16 had demonstrable esophageal disease that included spasm, achalasia, diverticulum, spasmodic stricture, hiatus hernia and cancer.[7] Most of these patients had no history of a previous cardiac abnormality, although some had angina or a history of infarction; neuroreflexes from the esophagus may unmask latent defects in cardiac conduction.

Although swallow syncope has been described as "another form of carotid sinus syncope",[4] our finding that carotid sinus massage had no effect in three patients in whom it was tried, which confirmed the earlier finding of Brick and colleagues,[11] suggests that swallow syncope is distinct from carotid sinus syncope.

Surgical treatment of swallow syncope aimed at correcting esophageal abnormalities or denervation has met with variable success.[5,6] Atropine and ephedrine have provided temporary control in a number of cases.[6]

The outcome of patients 1 and 3 in our series supports the use of a permanent cardiac pacemaker to prevent swallow syncope associated with bradycardia or a cardioinhibitory mechanism. Patient 1 had sinus bradycardia, and patient 3 had atrioventricular block. Although the bradycardia in both of these patients was induced by swallowing, it is clear that the vagal afferents responsible for this cardioinhibition were either nonresponsive or only partially responsive to carotid sinus stimulation.

Patient 3 most clearly demonstrated the reflex association between swallowing and bradycardia. She had no demonstrable esophageal or cardiac disease at the time of the initial assessment, but in the previous 8 years she had suffered many "seizures", which had clearly been attacks of bradycardia induced by swallowing. This association was proven by electrocardiographic monitoring and was reproduced during esophageal manometry. There was no clinical or electrocardiographic evidence of heart disease. This case demonstrates that swallow syncope can occur in the absence of clinically apparent disease of either the esophagus or the heart and supports the theory of Wik and Hillestad,[5] who contended that neuroreflexes originating from the esophagus might stimulate undiagnosed defects of cardiac conduction.

In patient 4, in whom bradycardia had not been documented, the failure of a permanent cardiac pacemaker to prevent syncope suggests that a vasodepressor mechanism mediated by vagal stimulation was operative. A similar dissociation between the cardioinhibitory and vasodepressor components of vagal-induced hypotension and syncope is seen in some instances of carotid sinus syncope and acute inferior myocardial infarction. The failure of a pacemaker to prevent syncope in this patient suggests that if a definitive diagnosis of a cardiac rhythm disturbance cannot be made the pacemaker should first be inserted for a trial period to establish therapeutic benefit.

In patient 5 swallowing-induced atrioventricular block was transient and presumably potentiated by an atrioventricular conduction delay associated with a recent inferior myocardial infarction. A similar transient increase of vagal tone has been observed in a patient taking digitalis; the symptoms disappeared when the drug was withdrawn.[8]

Although swallow syncope has been considered rare, the five cases we have described occurred in a 500-bed general hospital over 4 years. We therefore believe that this condition may be more common than has been suspected. We suggest that patients presenting with unexplained syncope be asked about any possible relation between the syncope and swallowing. If swallow syncope is suspected the patient's cardiac rhythm should be monitored during swallowing to detect any abnormal responses. If no reversible factors, such as effects of treatment with digitalis or acute myocardial ischemia, are evident, a cardiac pacemaker may provide symptomatic relief in properly selected patients. Radiologic examination of the upper gastrointestinal tract may also be warranted. With an increased awareness of swallow syncope and a comprehensive approach to its management it is reasonable to expect that this potentially lethal condition can be treated successfully.

We are grateful to Jeanine MacRoe and Maureen McClenaghan, for their editorial assistance, and Dr. John E. Fay, for allowing us to describe one of his patients.

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Scientific thought

Remember, then, that scientific thought is the guide of action; that the truth at which it arrives is not that which we can ideally contemplate without error, but that which we may act upon without fear; and you cannot fail to see that scientific thought is not an accompaniment of human progress, but human progress itself.

—William Kingdon Clifford (1845–1879)