

Zenker's Diverticulum and Other Esophageal Diverticula — Definition and Symptoms

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Diverticula can be found in various organs, in particular in the colon, but also in the duodenum or ileum, and in the esophagus. Every medical student should internalize the differences between true and pseudo-diverticula. Zenker's diverticulum, in particular, is often quizzed in exams.



Definition and Pathogenesis of Diverticula

True and false diverticula

Diverticula are wall protrusions of hollow organs, whereby a distinction has to be made between “true” and “false” diverticula. It pays to learn the definitions, as they usually come up in exams.

True diverticula

In case of a true diverticulum, all wall layers are affected, even the muscularis. The **protrusion** often arises through tension from outside, in the course of scarred or inflammatory changes that can be found e.g. with **tuberculosis** or **lymphadenitis**.

False diverticula (or “pseudodiverticula”)

In this case, only **mucosa** and **submucosa** evert to the outside through a weak spot in the muscle layer. The reason for this is increased **intraluminal pressure**.

With respect to the esophagus, the different diverticula can be classified on the basis of their location, as well as their “true” or “false” nature as:

Traction diverticula

They correspond to the above-mentioned “true diverticula” and are usually found on the level of **tracheal bifurcation**. They are therefore also referred to as **bifurcation diverticula** or **para-bronchial diverticula**.

Pulsion diverticula

They correspond to the above-described “false diverticula.” Predilection sites are the following, muscle weak points of the esophagus:

- **Laimer triangle** (= **longitudinal muscle-free** zone on the **upper esophagus**).
- **Killian triangle** (= muscle weak area between **Pars obliqua** and **Pars**

fundiformis of the **cricopharyngeal muscle** of the **dorsal hypopharynx**):

Strictly speaking, this is really a diverticulum of the hypopharynx, although it is usually dealt with in context with the **esophagus**. Diverticula in the area of the **Killian triangle** are also known as **Zenker's diverticula**.

- **Above the diaphragm**: This is called an **epiphrenic diverticulum**.

Epidemiology of Zenker's Diverticulum

Zenker's diverticulum is the most common representative with 70% and mainly affects older men, followed by the **traction diverticula** with 20% and **epiphrenic diverticula** with 10%.

Symptoms of Esophageal Diverticula

Dysphagia and regurgitation

Especially large diverticula bring on complaints. Patients complain of dysphagia, retrosternal pain, feeling of pressure and nightly regurgitation of undigested food residues. The latter is connected to risks of aspiration and pneumonia. Deposition of food residues in the bulges leads to **fetid halitosis**. Some patients describe a "gurgling" sound while drinking.

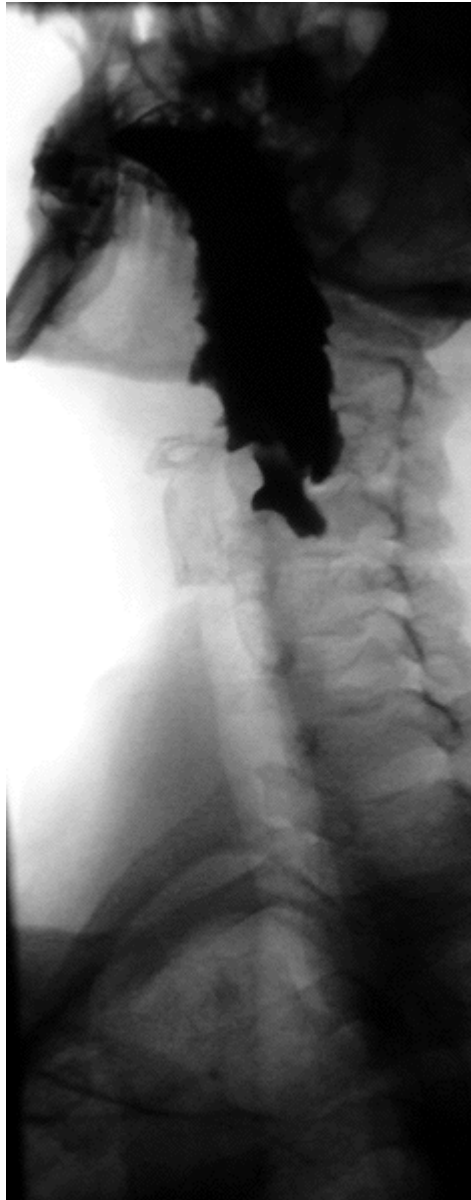
Diverticula rarely become inflamed, bleed, perforate or form **fistulas**.



Image: "Barium esophagram revealing traction esophageal diverticulum with communication into the right upper lobe segmental bronchi." by Openi. License: [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)

Note: Small diverticula, especially epiphrenic and para-bronchial diverticula often remain asymptomatic and are incidental findings in the course of i.e. x-rays.

Diagnosis of Esophageal Diverticula



[Image](#): "Nachweis eines Zenker-Divertikels mittels Breischluck. Schräger Strahlengang." by Bernd Brägelmann. License: [CC BY 3.0](#)

Esophageal bolus swallow test is the method of choice

The diagnostic method of choice is an **esophageal bolus swallow test**. Due to the possible presence of a perforation, it is recommended to use a water-soluble contrast medium, as there's a risk of **mediastinitis** or **peritonitis** upon exit from the esophagus when using barium. X-ray images most often clearly show the accumulation of a contrast agent in the protuberances, and allow a precise differentiation of the diverticula according to their location. **Traction diverticula** usually feature "ear-like" outgrowths, while pulsion diverticula are mainly sack-shaped.

Endoscopy

In order to be able to exclude other causes for the symptoms (carcinoma?), an endoscopy should always be carried out as well. However, care must be taken as the **mucous membrane** in the area of diverticula wall is particularly prone to perforation.

Differential Diagnoses

In terms of differential diagnosis, one should particularly consider **esophageal carcinoma!**

Therapy of Zenker's Diverticulum

Surgical measures for Zenker's diverticula

Diverticula can be treated surgically. However, this is only indicated for **Zenker's diverticula** and rarely for larger and symptomatic **epiphrenic diverticula**.

Note: Traction diverticula and epiphrenic diverticula usually require no treatment! In the case of Zenker's diverticula, however, there is always a surgical indication. The operation can be carried out endoscopically or openly. The diverticulum is resected and, in addition, a **myotomy** of the **cricopharyngeal muscle** is carried out in **Zenker's diverticula** in order to avoid a recurrence. The lethality is very low and the success rate is high (95%). Postoperative complications are recurrent **paresis, mediastinitis** or **neck abscesses** and **saliva fistulas**.

Review Questions

The correct answers are located below the references.

1. Which statement is correct?

- A. The Zenker's diverticulum is an epiphrenic diverticulum.
- B. Para bronchial diverticula are among the pulsion diverticula.
- C. Traction diverticula are always false diverticula.
- D. An epiphrenic diverticulum is always a real diverticulum.
- E. A bifurcation diverticulum is a traction diverticulum.

2. The Zenker's diverticulum...

- A. ...is not as well represented as other diverticula with 20%.
- B. ...is located in the area of the Laimer triangle in the upper esophagus.
- C. ...shows a contrast agent-filled bulge in the area of the hypopharynx during the esophageal bolus swallow test.
- D. ...is treated surgically only in rare cases.
- E. ...rarely causes symptoms.

3. Which statement about the pathogenesis of esophageal diverticula is true?

- A. In the case of a false diverticulum, all wall layers are affected by the protrusion.
- B. True diverticula are mostly a result of increased intraluminal pressure.
- C. In true diverticula, mucosa and submucosa evert through the muscle layer.
- D. Traction diverticula can result from a tuberculosis infection.

References

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Correct answers: 1E, 2C, 3D

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