In clinical practice, Boerhaave and Mallory-Weiss syndromes rarely appear. However, you should have these two syndromes in mind when dealing with patients in acute pain or bleeding after an episode of violent vomiting in order to make a correct diagnosis at the crucial moment. Questions about this subject are also likely to be asked in tests. Therefore, medical students should be able to keep these two syndromes apart, particularly their epidemiology and clinical symptoms.

Definition and Pathophysiology of Boerhaave and Mallory-Weiss Syndrome

In the Boerhaave syndrome, a rupture of all layers of the esophagus occurs. In most cases, the lower half of the esophagus, dorsolaterally on the left side, is affected. A relatively low muscle tone is prevalent here, as in other areas of the esophageal muscles. The event of rupture is preceded by an acute pressure load, with strong, forced vomiting in most cases, typically in conjunction with excessive alcohol consumption.
The Mallory-Weiss syndrome is also preceded by forced vomiting and retching. Here, the mucosa of the esophagus is already damaged, often due to high alcohol consumption, and less commonly due to chronic gastroesophageal reflux disease or atrophy (with elderly patients). Finally, in the course of acute pressure load, longitudinal lacerations of the mucosa and submucosa, particularly in the area of the gastroesophageal junction, occur. The muscularis mucosae remains intact, so there is no perforation!

**Epidemiology of Boerhaave and Mallory-Weiss Syndrome**

Both symptoms affect men more often than women and are most commonly observed in alcoholics.

The Mallory-Weiss syndrome makes up approximately 5 – 10 % of the causes of upper gastrointestinal bleeding.

**Symptoms of Boerhaave and Mallory-Weiss Syndrome**

**Retrosternal pain and hematemesis**

In the Boerhaave syndrome, patients describe something close to retrosternal destruction pain after vomiting. This sensation may radiate to the back.

Dysphagia and dyspnea are common symptoms. Also, a pneumothorax often occurs with or without pleural effusion due to esophageal rupture and the nearby pleura. Another ground-breaking finding is the development of cutaneous emphysema. If it is above the jugular, it needs to be considered as an indication of mediastinal emphysema. The combination of severe vomiting, retrosternal destruction pain and cutaneous or mediastinal emphysema is also called Mackler’s triad.

**Note:** Bleeding is not necessarily the only symptom of Boerhaave syndrome!
In addition, the Mallory-Weiss syndrome is accompanied by severe pain, which, however, patients often locate in epigastric areas. The hematemesis is in this case decisive,
particularly the vomiting of blood.

Differential Diagnoses

Esophageal varices

Boerhaave and Mallory-Weiss syndrome may have similar clinical manifestations and are, thus, differential diagnoses when the aforementioned symptoms are both pointed out. Furthermore, a rupture of esophageal varices must be considered, alongside the corresponding anamnesis (alcoholics, liver cirrhosis?). The varices can rupture during heavy vomiting and cause hematemesis.

Diagnosis of Boerhaave and Mallory-Weiss Syndrome

Medical imaging and esophagogastrosopies

In the Boerhaave syndrome, a radiograph of the chest and esophagus with water-soluble contrast medium (No Barium in case of suspected perforation! Risk of mediastinitis!) should be performed immediately.

In this instance, first indications of the syndrome arise when the following questions are asked: How is the contour of the esophagus shaped? Is there a pneumothorax or a pleural effusion?

![Image: “CXR showing surgical emphysema,” by Chikkappa MG, Morrison C, Lowe A, Gorman S, Antrum R, Gokhale J. License: CC BY 3.0](https://example.com/image)

In CT thorax, more accurate statements about the extent of the rupture can be made; also, cutaneous emphysema can be seen here distinctly.
If the Mallory-Weiss syndrome is suspected, an **esophagogastroscopy** should be performed immediately, as this can also be connected to similar therapeutic intervention.

**Therapy of Boerhaave and Mallory-Weiss Syndrome**

**Surgery, stent or fibrin?**

If the Boerhaave syndrome is diagnosed, a surgery should be performed within the first 24 hours (mortality is usually up to 60%). Here, the ruptured portions are released and sutured. If this is not possible due to pronounced results, an **esophagectomy** with gastric pull-up or colon interposition must be performed. If the rupture only has a small extent, an endoscopical stent can be attempted. Due to the risk of mediastinitis, broad-spectrum antibiotics must be introduced!
In the Mallory-Weiss syndrome, however, surgery is rarely necessary. Here, usually an **endoscopic hemostasis** (fibrin glue or injection of adrenaline in the source of bleeding) is sufficient.

**Note:** For either syndrome, a balloon tamponade is not recommended!

## Complications

### Mediastinitis and blood loss

As part of the esophageal perforation in the Boerhaave syndrome, mediastinitis can develop. Typical symptoms include fever, retrosternal pain, cutaneous emphysema, superior leverage accumulation and shock. The upper respiratory tract may be moved. A sepsis with spread to the pleura or pericardium is possible.

Another dangerous consequence is a thrombosis of the **vena cava**. If a chest x-ray exhibits a widened mediastinum and cutaneous emphysema in the area of the jugular, these are considered warning signs for mediastinitis.

In the Mallory-Weiss syndrome, lesions of the **mucous membrane** and consequent bleeding are crucial. Especially in patients treated with anticoagulant drugs, it can lead to high **blood loss**.

## Review Questions

The solutions can be found below the references.

1. **Which symptoms does a patient with Boerhaave syndrome not tend to present?**
   
   A. Retrosternal pain  
   B. Fever  
   C. Dysphagia  
   D. Erythema nodosum
E. Subcutaneous emphysema

2. In the Mallory-Weiss syndrome...

   A. ...a rupture occurs in all layers of the esophagus.
   B. ...an alcohol abuse must not be preceded.
   C. ...a surgery within the next 24 hours must be performed.
   D. ...a pneumothorax is often developed.
   E. ...women are more often affected than men.

3. A 40-year-old man is brought to the emergency department by ambulance. After an episode of severe vomiting he had suddenly felt stabbing pains on the left thoracic side. Since then, he complains of increasing dyspnea. The patient shows cold welding and is tachycardic. In his anamnesis, alcohol abuse is found. In his chest X-ray, you notice a widened mediastinum and cutaneous emphysema on the jugular. What diagnosis is most likely?

   A. Esophageal variceal rupture.
   B. Mediastinitis in the course of Boerhaave syndrome.
   C. Mallory-Weiss syndrome after excessive alcohol abuse.
   D. Posterior wall infarction.
   E. Rupture of an aortic aneurysm.

References

Hartmut Köppen, Gastroentereologie für die Praxis, Thieme-Verlag, 2010

Gerd Herold und Mitarbeiter, Innere Medizin, Gerd Herold, 2015

Behandlung der Mallory-Weiss-Läsion für Chirurgen, via Berlin Chirurgie

Biecker Erwin u.a., Effiziente Diagnostik und Therapie oberer gastrointestinaler Blutungen, via Deutsches Ärzteblatt

Klinik und Poliklinik für Innere Medizin I des Universitätsklinikums Regensburg, Gastrointestinale Blutung

Hanns-Wolf Baenkler und Hartmut Goldschmidt, Kurzlehrbuch Innere Medizin, Thieme Verlag, 2015

Dr. Hanns Ackermann, Dr. med. Konrad Aden u.a., AllEx Kompendium für die 2. ÄP, Thieme Verlag, 2012

MIAMED GmbH, Amboss

Correct answers: 1D, 2B, 3B

Legal Note: Unless otherwise stated, all rights reserved by Lecturio GmbH. For further legal regulations see our legal information page.