# Ingestion of acids and alkalis

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This article has been translated from WikiSkripta; ready for the **editor's review**.

Acids and bases are "corrosive substances" which, in concentrated form, act only locally and cause tissue corrosion.

## Pathogenesis

The **acids'** precipitate the proteins and cause the so-called **coagulative necrosis** with a dry and well-demarcated plaque. An exception is hydrofluoric acid, which causes colliquative necrosis.

Concentrated "lyes" dissolve proteins and "penetrate" deep into healthy tissue. The surface of the damaged tissue is grey-white, mushy and not sharply demarcated compared to the surrounding area, it is a so-called *colliquation necrosis*. Healing of this necrosis is lengthy and may cause strictures and scarring.

The degree of damage depends on the concentration, amount, length of exposure and the presence of food in the stomach.

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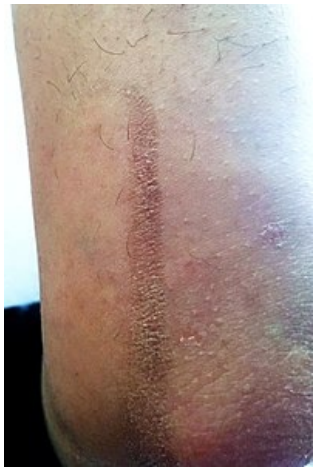
## Ingestion of acids

The most common are hydrochloric acid HCl, sulfuric acid $H_2SO_4$, nitric acid $HNO_3$, hydrofluoric acid HF, oxalic acid $COOH_2$, etc. After ingestion of acids, mucosal burns occur. The esophagus is usually affected little, on the contrary, the maximum lesions are in the antrum of the stomach with the risk of circular scarring and stenosis of the pylorus (perforation of the stomach and the proximal part of the intestine is not excluded).

Preparations: WC cleaners, rust remover, battery acid, kettle descaler, waste cleaner.



Acid burn

### Clinical picture

Epigastric pain, vomiting, hematemesis. **Skin burn'** ***causes severe pain. When it gets into the eyes, lacrimation, pain and photophobia occur (weak acid causes conjunctivitis, strong acid seriously damages the cornea with ulceration or perforation).*** *Inhalation* ***causes cough, dyspnoea, headache and general weakness, sputum is frothy. Within 6-8 hours,*** *pulmonary edema with hypotension and shock* may develop.

## Ingestion of lye

In addition to lye (*sodium and potassium hydroxide*), bases also include some other substances that react alkaline, e.g. 'calcium oxide *(quicklime).*

Preparations: Waste, stove and grill cleaners, paint removers, dishwasher preparations.

### Clinical picture

Immediately after ingestion, patients report severe pain from the mouth to the stomach. The effect is slower and drawn out. The process can be divided into 3 stages:

**Stage I**

Onset within 4 days of ingestion. It is manifested by difficult or impossible swallowing (edema and spasm at the site of the bite), vomiting and hematemesis. Swelling of the glottis can cause upper airway obstruction. The absence of a lesion in the oral cavity does not rule out '*erosion of the esophagus*, which is affected most often.

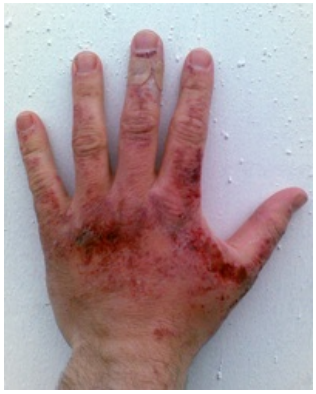
**Stage II**

4-14 days after ingestion. Healing is taking place, but **perforations** may still occur. Perforation is manifested by severe abdominal pain, angina pectoris and sudden hypotension.

**Stage III**

Onset weeks after ingestion. The most common late consequence is '*esophageal strictures*, manifested by dysphagia and nutritional disorders.

# Diagnosis



lye splash

In the case of confirmed ingestion, we indicate **endoscopic examination'**. Even with a normal finding in the oral cavity, it is absolutely necessary to perform an ENT examination. Furthermore, **KO + dif.**, **iontogram**, **Astrup** and **RTG** to rule out perforation.

In the 3rd-4th a week after the cauterization, we perform a control esophagoscopy to diagnose any strictures that may have arisen.

**Evaluation of esophageal endoscopy**

1. degree of damage – erythema and mucosal edema.
2. degree of damage – mucosal ulceration.
3. degree of damage – ulceration into the muscle layer, formation of strictures after healing.
4. degree of damage – perforation of the wall.

# Therapy

Stabilization of vital functions, securing of the patient by monitoring and also at the entrance. As part of first aid, immediately carry out **flushing the cavity with oral water** followed by ingestion of 100-300 ml of water or milk. If the patient refuses because of pain, the damage is already extensive, or there has been a perforation (contraindication for after administration). Even with normal findings in the oral cavity, it is absolutely necessary to perform an ENT examination.

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- Methylprednisolone 10 mg/kg IV every 6 hours;
- volume expansion during shock, administration of blood during significant bleeding;
- parenteral nutrition in case of significant burns;
- preventive ATB therapy (mainly in case of perforation or increase of inflammatory markers).

# Links

## Related Articles

- Safety data sheets of chemical substances
- Esophageal injuries

## Source

- HAVRÁNEK, Jiří: *Ingestion of acids and alkalis*.
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