**Columnar lined esophagus (CLE)**

**Basics**

Normally the squamous epithelium covers the innermost layer (mucosa) of the esophagus (gullet). Reflux inflames the esophagus. As a consequence the normal mucosa is replaced by a mucosa, which is lined by a columnar epithelium. This condition is termed columnar lined esophagus (CLE). Columnar lined esophagus catalogs the following types of mucosa (Chandrasoma classification):

- Cardiac mucosa (mucus cells only), oxyntocardiac mucosa (mixture of mucus cells and parietal cells; parietal cells are acid producing cells, normally only exist in the body of the stomach), intestinal metaplasia (mucus cells and goblet cells; this is Barrett’s esophagus). Via dysplasia Barrett’s esophagus may progress towards esophageal cancer (0.5% annual risk).
- Multilayered epithelium is a mixture of squamous and columnar cells.

The classification is named after the US American pathologist Para Chandrasoma (Los Angeles).

**Causes**

Columnar lined esophagus (CLE) results from reflux. Therefore causes for CLE include all factors promoting reflux (eating behavior, life style). In addition the presence of CLE always indicates reflux (reflux is the only cause for CLE development).
Reflux causes the development of columnar lined esophagus.

**Symptoms**

Symptoms of columnar lined esophagus include heartburn, acid regurgitation, cough, asthma and difficulties at swallowing. CLE also exists without heartburn. 10% to 15% of individuals with Barrett’s esophagus do not perceive heartburn. Up to 75% of esophageal adenocarcinomas (cancers) develop without a preceding history of heartburn and other reflux symptoms.

**Diagnosis and tests**

Diagnosis and tests for the assessment of columnar lined esophagus include gastroscopy and the histopathology of biopsies obtained from the esophagus. The biopsies are examined by a pathologist and cataloged according to the Chandrasoma classification (cardiac mucosa, oxyntocardiac mucosa, intestinal metaplasia). Dysplasia is cataloged according to the Ridell classification (named after the Canadian pathologist Robert H. Riddell). Cancer is staged according to an international classification (UICC: union international contre cancer). Endoscopically visible CLE (CLEv) and the dilated distal esophagus comprise the squamo oxyntic gap (see there).

**Treatment of CLE**

Treatment of columnar lined esophagus (CLE) depends on the tissue type. Since Barrett’s esophagus shares the same cancer risk as a polyp of the colon (0.5% annual risk!), it is eliminated with radiofrequency ablation (RFA, HALO®). Dysplasia and early cancer is removed by endoscopic mucosal resection (±radiofrequency ablation). The treatment of advanced cancer includes a tailored oncological therapy (chemo, radiation, surgery).

**Prevention of CLE**
Columnar lined esophagus can be prevented by lifestyle measures, which prevent reflux.

**Self test**

Reflux symptoms (heartburn, cough, asthma etc.) and symptom relief upon therapy with antacids or proton pump inhibitor indicate the presence of columnar lined esophagus. You are recommended to undergo gastroscopy. The test excludes cancer risk (Barrett’s esophagus).

**Expert opinion**

**Johannes Lenglinger (Physiologist, Vienna):**

There should be no esophageal manometry and esophageal reflux monitoring without a prior gastroscopy. Adequate biopsy sampling is essential for the exclusion of cancer risk (Barrett’s esophagus). Columnar lined esophagus proofs that a person had reflux. This means that CLE is specific for reflux. Esophageal reflux monitoring assesses if reflux is the cause for the symptoms. Therefore, the work up of reflux patients includes gastroscopy, manometry and reflux monitoring.

**Martin Riegler (Surgeon, Vienna):**

We routinely perform standardized biopsy sampling from the esophagus using our unique protocol. CLE is the marker for reflux. The distance between the most proximal and most distal esophageal biopsies positive for CLE define the length of the reflux-injured segment of the esophagus: the squamo-oxyntic gap. Thus CLE helps us to diagnose reflux. Treatment targets the CLE positive segment of the esophagus.

**Sebastian Schoppmann (Surgeon, Vienna):**

Gastroscopy is essential in the diagnosis of reflux. For us the columnar lined esophagus (CLE) is a marker for reflux. The type of tissue defines absence or presence of cancer risk. If CLE contains Barrett’s esophagus (cancer risk) we recommend radiofrequency ablation (HALO®). If reflux hurts and medical treatment does not provide adequate heartburn relief we offer anti reflux surgery: the magnetic ring operation or fundoplication. In experienced hands anti reflux surgery is effective in more than 90% of the cases. Over time medical therapy fails in up to 50% of the cases.

**Literature**

8. Fleischer DE, Odze R, Overholt BF et al. The case for endoscopic treatment of non-dysplastic and


