ABSTRACT

Background: Barrett's esophagus (BE) is a premalignant condition defined by replacement of normal esophageal squamous-cell epithelium by cylindrical epithelium with intestinal metaplasia (IM). Patients with BE associated neoplasia (BORN) are candidates for endoscopic treatment. The aims of our studies were: (1) analysis of long-term efficacy of radiofrequency ablation (RFA) and evaluation of risk factors for persistent/ recurrent neoplasia/ IM; (2) to assess the results and safety of confocal laser endomicroscopy (CLE) compared to standard biopsies in patients after successful endoscopic treatment of BORN; (3) to assess the sampling quality obtained by different types of forceps; and (4) to assess "de novo" reflux after peroral endoscopic myotomy (POEM) and its severity (the risk of development of further complications).

Patients and methods: We performed a total of 4 studies. (1) In a retrospective RFA study we evaluated data of 136 patients treated endoscopically for BORN in 4 centers in the Czech Republic. (2) In a prospective, pathologist-blinded, CLE study, we evaluated concordance in the detection of IM or neoplasia with CLE compared to standard biopsies in 56 patients who underwent standard surveillance endoscopy. (3) In a prospective study comparing 4 types of forceps, we evaluated the results of 37 patients with BE who underwent regular surveillance endoscopy. (4) In the last retrospective study, we evaluated the incidence of post-POEM esophagitis and its possible complications in 412 patients using upper GI endoscopy and 24h pH-metry 3 months, 2-3 and 6 years after POEM.

Results: (1) Complete remission of neoplasia and IM was achieved in 98,5 % (95 % CI 94,8-99,8 %) and 77,9 % (95 % CI 70,0-84,6 %) patients. During the follow-up, 6 patients (4, 5 %; 6/134 pts) had recurrent neoplasia (5x LGD, 1x HGD). In the multivariate logistic regression analysis adjusted for age, gender and length of the original BE segment, the diagnosis of cancer was an independent risk factor for recurrent IM after RFA (OR 7,0; 95 % CI 1,6-30,9; $p < 0,0005$). (2) Diagnostic accuracy, sensitivity, specificity, positive and negative predictive value of CLE and biopsy were not significantly different. The agreement between CLE and histopathological findings in the detection of IM was 94,6 %. (3) A forceps study showed that 71 % of biopsies taken with jumbo forceps were adequate, which was significantly more compared to large-capacity forceps ($p < 0,001$). (4) Three months

after POEM, reflux esophagitis was diagnosed in 167 patients (41,8 %; 167/400 pts), of which 15 patients (3,75 %; 15/400 pts) had severe esophagitis (Los Angeles classification grade C or D). During the follow-up, the incidence of esophagitis after POEM decreased (2 and 3 years after POEM in 35,9 % of patients, in the 6th year in 21,3 % of patients). We have not detected a reflux related complication after POEM (e.g. stricture, Barrett's esophagus) in any patient.

Conclusions: (1) RFA is an effective method in the treatment of BORN. Diagnosis of adenocarcinoma is a risk factor for recurrent IM after RFA, the clinical significance of which is questionable in the absence of macroscopic recurrence of BE. (2) CLE may be useful in patients undergoing endoscopic surveillance after endoscopic treatment of BORN because it is at least as effective as biopsies in detecting persistent/ recurrent IM and in excluding recurrent neoplasia. (3) We found a significantly higher proportion of adequate biopsy specimen with jumbo forceps as compared to three large capacity forceps. (4) Despite the more frequent occurrence of post-POEM esophagitis, we did not observe any serious complications of reflux during the long-term follow-up.

Key words: Barrett's esophagus; neoplasia; intestinal metaplasia; radiofrequency ablation; confocal laser endomicroscopy; peroral endoscopic myotomy.