Eicosapentaenoic Acid Dissolves Cholesterol Gallstones by Attenuating Cholesterol Saturation and Suppressing Mucin Production in Mice

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Background: The increasing prevalence of cholesterol gallstone (CG) disease has become an economic burden to the healthcare system. Ursodeoxycholic acid (UDCA) is the only established medical agent used to dissolve gallstones. In investigating novel therapeutics for CG, we assessed the therapeutic effects of eicosapentaenoic acid (EPA), which is one of most bioactive omega-3 polyunsaturated fatty acids, on CG induced by feeding a lithogenic diet (LD) containing high cholesterol levels to mice.

Methods: Mice were divided into the following four groups: (A) LD; (B) LD+EPA; (C) LD+UDCA; (D) LD+EPA+UDCA. After LD feeding for 10 weeks, EPA or UDCA was administered orally and the diet maintained for 16 weeks. The levels of phospholipids and cholesterol in bile, CG dissolution, gallbladder wall thickness, MUC gene expression in gallbladder were analyzed.

Results: Mice in the EPA treatment (Groups B, D) showed significantly higher stone dissolution than the control LD group (Groups A). The combination treatment of EPA and UDCA accelerate stone dissolution more than mono-therapy with EPA or UDCA. Bile phospholipid levels were significantly elevated and cholesterol saturation index measured in those patients who presented within the first 72 h of the onset of AP. Areas under receiver operating characteristic (ROC) curves of IL-6 to predict central fat distribution, obesity, and severity of pancreatitis were 0.727, 0.677, and 0.711, respectively (P < 0.05).

Conclusion: Elevated levels of IL-6 was associated with central fat distribution, obesity, and severity of pancreatitis in patients with AP and suggested its pathophysiological significance in AP.

Clinical Outcome of Incidental Gallbladder Cancer: A Single Center, Descriptive Study in Jeju Island

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Background: Gallbladder cancer (GBC) is a rare malignancy characterized by high invasiveness and poor survival. In a nation-wide cancer survey, the age-standardized incidence rate of GBC was the highest in Jeju Island compared to 15 other provinces in Korea. The purpose of this study was to compare the clinical outcomes of GBC according to the nature of diagnosis, that is, incidental versus non-incidental.

Methods: Consecutive patients who were newly diagnosed with GBC at the Digestive Disease Center and Department of Internal Medicine, Cheju Halla General Hospital, between November 2009 and November 2013 were enrolled in this study. Patients were divided into 2 groups: incidental gallbladder cancer (IGBC) and non-incidental gallbladder cancer (NIGBC). Clinical outcomes were retrospectively compared between the two groups.

Results: Seventy-nine patients were enrolled and analyzed in our study. Thirty-three (41.8%) and 46 (58.2%) patients were identified as having IGBC and NIGBC, respectively. The median survival rate was significantly higher for patients with IGBC than for those with NIGBC (11.4, 95% confidence interval, 5.6–13.7 vs. 4.0, 95% confidence interval 3.03–5.96 months; p = 0.01) during a median follow-up period of 5.7 months.

Conclusions: Patients with IGBC showed better clinical prognosis than those with NIGBC. Therefore, patients with gallstone disease or gallbladder polyps, major predictive risk factors for IGBC, should undergo aggressive work-up for cholecystectomy.

Evaluation of Bipolar Radiofrequency Ablation of the Stented Bile Duct: In Vitro Study

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Background: Bipolar RFA catheters for endobiliary RFA of biliary malignancy have been introduced. Animal study using porcine model showed that there is a linear relationship between the power of bipolar RFA and the depth bile duct ablation. Bipolar RFA of the tissue ingrowth in self-expandable metal stents (SEMSs) might restore the stent patency. However, there is no in vivo model to simulate tissue ingrowth in SEMS. The aim of this study was to simulate the bipolar RFA effect on tissue ingrowth that causes SEMS occlusion using polycrystalline gel phantom model.

Methods: In vitro simulation of RFA of tissue ingrowth in SEMS was done using polycrystalline gel phantom model. In brief, the gel fluid was poured into 4-ml cuboidal cuvettes. Bipolar radiofrequency (RF) RFA at power of 10 W and duration of 30 seconds was done to uncovered SEMS-embedded (n=10) and damaged covered SEMS-embedded (n=10) gel phantoms and plain gel phantoms (n=10) serving as controls. The RFA effects were compared.

Results: The RFA of uncovered SEMS-embedded gel phantoms resulted in early termination of RF generation upon contact of the coagulated area with the wire of the SEMS. In the damaged covered SEMS-embedded gel phantom model, early termination of RF generation was not observed. In half of the models, the coagulated area was confined within the covered SEMS lumen. In the other half, the coagulated area expanded beyond the wall of covered SEMS.

Conclusions: Bipolar RFA of tissue ingrowth in uncovered SEMS might be of limited efficacy, as the RFA effect is limited around the individual electrodes and cannot reach beyond the SEMS wall. Bipolar RFA of tissue ingrowth in damaged covered SEMS might be of more efficacy, as the RFA effect may reach beyond the wall of SEMS.