Introduction: Although contact force (CF)-sensing catheters improve procedural effectiveness and safety of atrial fibrillation ablation, recent reports documented a higher incidence of atrioesophageal fistula formation relative to ablation with non-CF-sensing catheters. The present study was to assess whether restricting CF to <20 g reduced risk for esophageal injury (EI) in patients with atrial fibrillation undergoing circumferential pulmonary vein isolation.

Methods: This prospective, single-center, randomized study enrolled 89 consecutive patients (mean age, 57.2±11.3 years; 57.3% men) with atrial fibrillation (68.5% paroxysmal and 31.5% persistent). Computed tomography angiography, transesophageal echocardiography, and esophageal endoscopy were conducted before the procedure, and a repeat esophageal endoscopy was performed after the procedure. Patients were randomized to restricted-CF group (n=44) or non-CF group (n=45), with circumferential pulmonary vein isolation using a CF-sensing (CF restricted to <20 g) or non-CF-sensing catheter, respectively. The primary end point was rate of EI post ablation.

Result: Baseline characteristics were evenly distributed between groups, without a case of preprocedural EI. With the same power setting, similar ablation time and average measured catheter tip temperature during posterior wall ablation just opposite to the esophagus in all patients in the restricted-CF group versus non-CF groups, there were no cases versus 9 (20%) cases of EI post ablation, respectively, with similar rate of freedom from atrial tachyarrhythmias at mean 31.3±6.5 months follow-up (68.2% versus 64.4%; P=0.3798).

Conclusion: Risk for EI was minimized when CF was restricted to <20 g at the posterior left atrial wall, where the circumferential pulmonary vein isolation lesion set and the course of the esophagus overlapped in all subjects.