



## Arrhythmias

### PERCUTANEOUS LIGATION OF THE LEFT ATRIAL APPENDAGE RESULTS IN ATRIAL ELECTRICAL SUBSTRATE MODIFICATION

Oral Contributions

West, Room 2006

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**Background:** Left atrial (LA) electrical remodeling is a recognized factor in the development of atrial fibrillation (AF). We investigated whether LA appendage (LAA) ligation results in modification of LA electrical substrate.

**Methods:** Healthy male mongrel dogs (N=21, mean mass  $\pm$  SD 30.7  $\pm$  2.8 kg) underwent percutaneous epicardial LAA ligation. The ligation system grabbing forceps were guided by fluoroscopy and local electrograms (EGM) to the LAA. Successful ligation with a pre-loaded looped suture was confirmed intraprocedurally by cessation of LAA Doppler flow on transesophageal echocardiography (TEE) and loss of LAA electrical activity, and post procedure by direct visualization. P-wave duration on the surface ECG was measured immediately before and after LAA closure. Percent P-wave duration reduction was correlated with pre-closure LAA internal dimensions measured by TEE and external dimensions measured on necroscopic specimens. LAA EGM were monitored by the grabber.

**Results:** LAA ligation was successful in all dogs and accompanied by loss of LAA EGM within a median  $<$  42 (interquartile range  $<$  21 - 227) seconds. There was significant reduction in P-wave duration immediately upon ligation (mean difference  $\pm$  SE 13  $\pm$  1 ms,  $p <$  0.0001). This was accompanied by reduction in PR interval (12  $\pm$  1 ms,  $p <$  0.0001) and increase in interval between the end of the P-wave and QRS (3  $\pm$  1 ms,  $p =$  0.015). Percent P-wave reduction was associated with a larger internal LAA area ( $R =$  0.73,  $p =$  0.002) and smaller external circumference ( $R =$  -0.81,  $p =$  0.049).

**Conclusions:** Percutaneous LAA ligation results in electrical isolation of the appendage and acute left atrial electrical remodeling, the degree of which is predicted by LAA geometry. Further investigation is required to determine mechanisms underlying associations with appendage morphology and whether this electrical debulking will help maintain sinus rhythm.