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Abstract Session 45: Catheter Ablation VII: Experimental Studies and Surgical Therapy

AB45-1

PRE-CLINICAL CANINE TESTING OF ENDOSCOPY TO GUIDE LASER APPLICATIONS FOR PULMONARY VEIN ISOLATION

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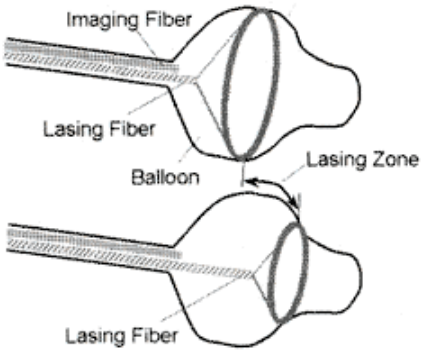
For laser ablation, laser energy should not be applied through blood, since it is absorbed by blood, reducing lesion size and the potential risk of thrombus. Lasing through a balloon in contact with the endocardium can provide a bloodless interface.
Hypothesis: Visualization of the balloon-tissue interface using an endoscopic fiber in the balloon plus adjustable location of energy delivery will allow pulmonary vein (PV) isolation without thrombus.
Methods: We tested visual guidance for PV isolation in 20 dogs using a forward firing endoscopic laser balloon catheter (ELBC, 980 nm, CardioFocus). After transeptal puncture, ELBC was placed through a deflectable 12F sheath into the right superior PV in 20 dogs and left superior PV in 11. ELBC was inflated (diameter 20 to 25 mm), occluding PV. Sites for lasing arcs (each 150° of circumference), marked by visible aiming light beam, were selected by rotating and advance/withdraw the lasing fiber in the balloon under endoscopy to ensure bloodless lasing. Connecting lasing arcs (power density 4.5, 5.5 or 6.0 W/cm, 60 sec) were applied around PV ostium. PV angiography and mapping (Lasso) were performed pre- and post ablation in 20 dogs, and before sacrifice at 1-14 (median 14) weeks in 17 dogs.
Results: Endoscopy identified circumferential bloodless interface in 29/31 (94%) PVs. Lasing in these 29 PVs achieved acute isolation at PV ostium in 27 (93%), using 3-12 (median 7.5) laser arc applications, without thrombus on the balloon. Isolation persisted at sacrifice in 17/23 (74%) PVs: 12/18 at 4.5 & 5.5 W/cm and 5/5 at 6.0 W/cm. Histology showed circumferential transmural lesions in 16/17 PVs with persistent block. There was 20-36% chronic ostial narrowing in 3/23 PVs and in 1 adjacent PV. Phrenic injury occurred in 1/20 dogs.
Conclusions: Endoscopy reduces risk of thrombus during lasing. ELBC isolates canine PVs with low risk of PV stenosis.



AB45-2

PATHOLOGY OF BETA RADIATION LESION: EFFECT OF CATHETER DESIGN, ABLATION SITE, AND PRESCRIBED