laser delivery will prevent tissue superheating and charring and allow direct visualization of lesion formation during ablation.

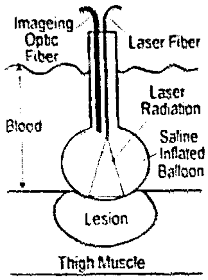
Methods: In 4 anesthetized dogs, the skin over the thigh muscle was incised and raised to form a cradle which was superfused with heparinized canine blood (37°C). A 10 F lumen catheter with a saline inflated balloon (12 mm in diameter) at the tip, a laser fiber (300 μ diameter) and an imaging optic fiber (1200 μ) was held perpendicular to the thigh muscle. 44 lesions were produced by delivering Nd:YAG laser energy, 10 mm from the surface of the thigh muscle. Laser energy was applied at 5 watts (for 60 or 120 sec) and 10 watts (for 30 or 60 sec) in pulsed mode (4 sec on/2 sec off). Tissue temperature was measured at depths of 3.5 mm and 7 mm.

Results:

n	Power (W)	Time (sec)	Pop	Char	Temp (°C) at 7 mm depth	Lesion (mm) diameter	Lesion (mm) depth
10	5	60	0/10	0/10	43 ± 6	9.8 ± 1.5	6.7 ± 1.2
10	5	120	0/10	1/10	48 ± 7	10.3 ± 2.1	7.0 ± 1.0
12	10	30	0/12	0/12	49 ± 6	10.3 ± 1.7	7.2 ± 0.6
12	10	60	0/12	1/12	52 ± 8*	11.5 ± 1.3*	7.9 ± 1.0*

* $p < 0.05$

During ablation, the margin of the lesion was easily recognized by the darkened color. Charring occurred only when blood infiltrated between the balloon and tissue in path of the laser. The tissue temperature at 3.5 mm depth quickly decreased by 8–15°C between each laser pulse, while temperature at 7 mm depth steadily increased.



Conclusions: Intermittent cooling of tissue by pulsing the laser energy allows deep lesion formation without steam formation and pop. Lesion formation and tissue charring can be monitored with direct visualization.

1046-169 Ventricular Fusion During Auricular Entrainment of Idiopathic Fascicular Tachycardias. Implications on Ventricular Tachycardia Circuit

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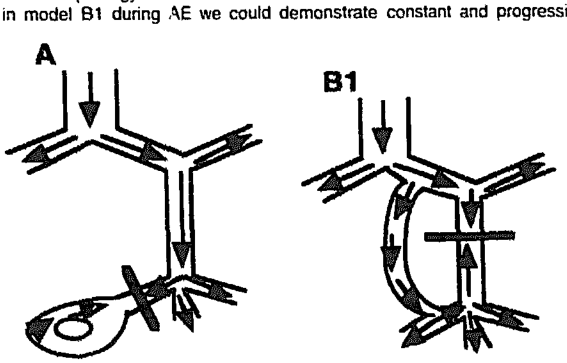
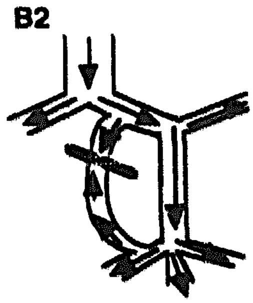
Introductión: Idiopathic fascicular tachycardias (IFT) are due to a macroreentrant mechanism. The presence of a muscular band (MB) and the left posterior hemibranch (LPH) as integral parts of the circuit is controversial.

Theoretical Model (TM): We propose two TMs of a MB connecting to the LPH: A) strictly muscular circuit connecting MB and LPH in a single attachment and B) *MB connected to LPB by two attachments* in which the MB could be either the antegrade (B1) or the retrograde limb (B2). If the slow conduction zone (SCZ) were localized in the LPH, during atrial pacing in sinus rhythm at the tachycardia rate the QRS morphology would maintain a LP hemiblock morphology. In models A and B2 during atrial entrainment (AE) the QRS morphology would be narrowed until its total normalization; However, in model B1 during AE we could demonstrate constant and progressive





ventricular fusion because of collision through left anterior hemibranch (see figure).

Material: We studied 7 p (5 M/2 F of 29 ± 18 y.o.) with IFT and a mean cycle length of 388 ± 51 ms.:

Results: During pacing in sinus rhythm none of the patients showed a LP hemiblock pattern suggest that the SCZ is not localized in the LPH. During AE four p. normalized the QRS morphology and three p. showed constant and progressive fusion suggest model B1.

Conclusions: This study shows for the first time ventricular fusion during AE in IFT and suggests that the SCZ is not localized in the LPH but in the MB, however the attachment between the MB and the LPH could be diverse.

1046-170 Anisotropic Reentry as a Mechanism of Ventricular Tachycardia in Patients

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Background: Previous work has suggested that reentrant circuits causing ventricular tachycardia (VT) in patients (pts) are relatively large, with an impulse circulating around scar tissue, and partially propagating through a zone of slow conduction within surviving subendocardial cellayers. However it is hypothetized, that because of increased tissue anisotropy, reentry may occur within such an area of surviving subendocardial cellayers. Consequently these circuits will be relatively small. This study was conducted to test this hypothesis during sustained VT in pts.

Methods: A basket-shaped 32-bipolar electrode catheter (BMC), integrated with a computerized mapping system, was used to reconstruct endocardial activation maps and to study local endocardial activation. VT was induced using programmed electrical stimulation applying up to 3 extrastimuli.

Results: Eighteen post myocardial infarction (MI) pts with drugrefractory VT were studied. The left ventricular ejection fraction was 34 ± 15%. Cycle length of VT was 305 ± 78 ms. Earliest endocardial activation during VT was recorded 49 ± 43 ms prior to the onset of the surface ECG. Due to the limited resolution of the mapping catheter reconstruction of a reentrant circuit was possible in only 8/18 pts. In 2 pts a large reentrant loop circulating around a left ventricular aneurysm caused VT. Based on the locally recorded ECG's, a small reentrant circuit could be reconstructed in 6 pts. Electrograms recorded around the line of block exhibited either double potentials, reflecting activation of two limbs of the reentrant circuit, or fragmented local activity at the pivoting points of the circuit. It appeared that these reentrant circuits could be confined within an area of < 4 cm^2. Stimulation at these sites provide evidence for the role of increased tissue anisotropy in 4/6 pts. During pacing slow conduction, as reflected by fragmented local electrical activity, over a considerable distance was recorded.

Conclusions: Anisotropic reentry may be a mechanism of some sustained VT in post MI pts. High resolution mapping studies are mandatory to study areas of increased anisotropy in detail.

1046-171 "Popping" During Radiofrequency Catheter Ablation: An In Vitro Model – New Observations

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Background: An audible "popping" sound (produced by sudden subendocardial steam release) during radiofrequency catheter (RF) ablation has been observed in the past but more rarely in the era of temperature (T)-controlled RF application.

Methods: We performed T-controlled RF application (70°C set point, 30–60 sec application, n = 153 trials) in freshly-explanted human left ventricles obtained at transplant, and noted the occurrence and features of an audible pop. Catheter tip (endocardial surface) and thermocouple needle (2 mm deep) T were monitored.