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CARDIAC TARGET PACING AND PRECISION ABLATION GUIDED BY ECHOCARDIOGRAPHIC TECHNOLOGIES IN VIVO

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Background To realise the real cardiac target pacing and precision ablation (ie, pacing and ablating at specific cardiac sites for relative normal electro-mechanical conductive sequence and better cardiac function) under the echocardiographic navigation, monitoring and evaluation.

Method After the echocardiographic mapping of detail anatomic structure of cardiac conductive system (ie, SAN, atrial wall, pulmonary vein, right Koch's triangle, IVS and ventricular wall) and its inner onset and propagation of myocardial electro-mechanical activation (ie, transmural acceleration distribution), the dedicated leads for His bundle pacing, precise AVN RF ablation and the needle for IVS ethanol ablation were guided to reach the targeted tissue in 12 open-chest canine models, and the cardiac function, myocardial electro-mechanical response of pacing and ablation were monitored via the same echocardiographic technologies simultaneously. Meanwhile, the complications of these administrations were evaluated during and after pacing and ablation.

Results The proper target pacing, precision RF and chemical ablation at different cardiac sites (ie, SAN, right superolateral crista terminalis, AVN, His bundle and IVS) were realised successfully in all animal models *in vivo*. The pacing and ablation electro-mechanical effect and the lesions, bubbles, subendocardial haematoma and embolus induced by pacing and ablation could be visualised and quantified instantly during the administration.

Conclusion The target pacing and precision ablation of cardiac conductive system could be achieved through guidance by echocardiographic technologies. The current pacing and ablation instrument should be further modified for the purpose of real target pacing and precision ablation in this echocardiographic monitoring environment for greater efficiency.