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THE SUBSTRATE OF COMPLEX FRACTIONATED ATRIAL ELECTROGRAMS: EVIDENCE BY PATHOLOGIC ANALYSIS

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Objectives Ablation of complex fractionated atrial electrograms (CFAE) is an important adjunctive therapy in atrial fibrillation (AF). The present study was to elucidate the substrate underlying CFAE.

Methods Nine adult mongrel dogs were involved in the present study. AF was induced through rapid atrial pacing with vago sympathetic nerve stimulation. CFAE was recorded during AF. Ablation was performed at CFAE sites. Based on the location of the ablation scar, the atrial specimens were divided into CFAE and non-CFAE sites. Serial sections of the atrium were stained respectively with haematoxylin-eosin (HE) and the general neural marker protein gene product 9.5 (PGP9.5). We compared the characteristics of the myocardium and the ganglionated plexus (GPs) distribution between the CFAE and non-CFAE sites.

Results The myocardium of non-CFAE sites was well-organised with little intercellular substance. However, the myocardium in the CFAE site was disorganised with more interstitial tissue (61.7±24.3% vs 34.1±9.2%, $p<0.01$). GPs in the CFAE site were more abundant than in non-CFAE sites ((34.45±37.46) bundles/cm^2 vs (6.73±8.22) bundles/cm^2, $p<0.01$).

Conclusions The heterogeneity of the myocardium and GPs distribution may account for the substrate of CFAE and serve as a potential target of ablation.