

Use of a novel intracardiac signal processing system during mapping of complex cardiac arrhythmias

Amin Al-Ahmad, Carola Gianni, Domenico G Della Rocca, J David Burkhardt, Rodney P Horton, G Joseph Gallinghouse, Patrick M Hranitzky, Rodney P Horton, Javier E Sanchez, Luigi Di Biase, Andrea Natale

Background

In complex arrhythmias, radiofrequency (RF) ablation is guided by the characteristics of intracardiac electrograms (EGM). In such cases, signal processing of EGMs is vital and can affect the ability to perform thoughtful mapping and ablation.

Herein we present the use of a novel intracardiac signal processing system during atrial fibrillation (AF) mapping and ablation.

Methods

We used two intracardiac signal processing systems, CardioLab (formerly, Prucka, GE) and PURE EP (BioSig), in patients undergoing ablation of AF.

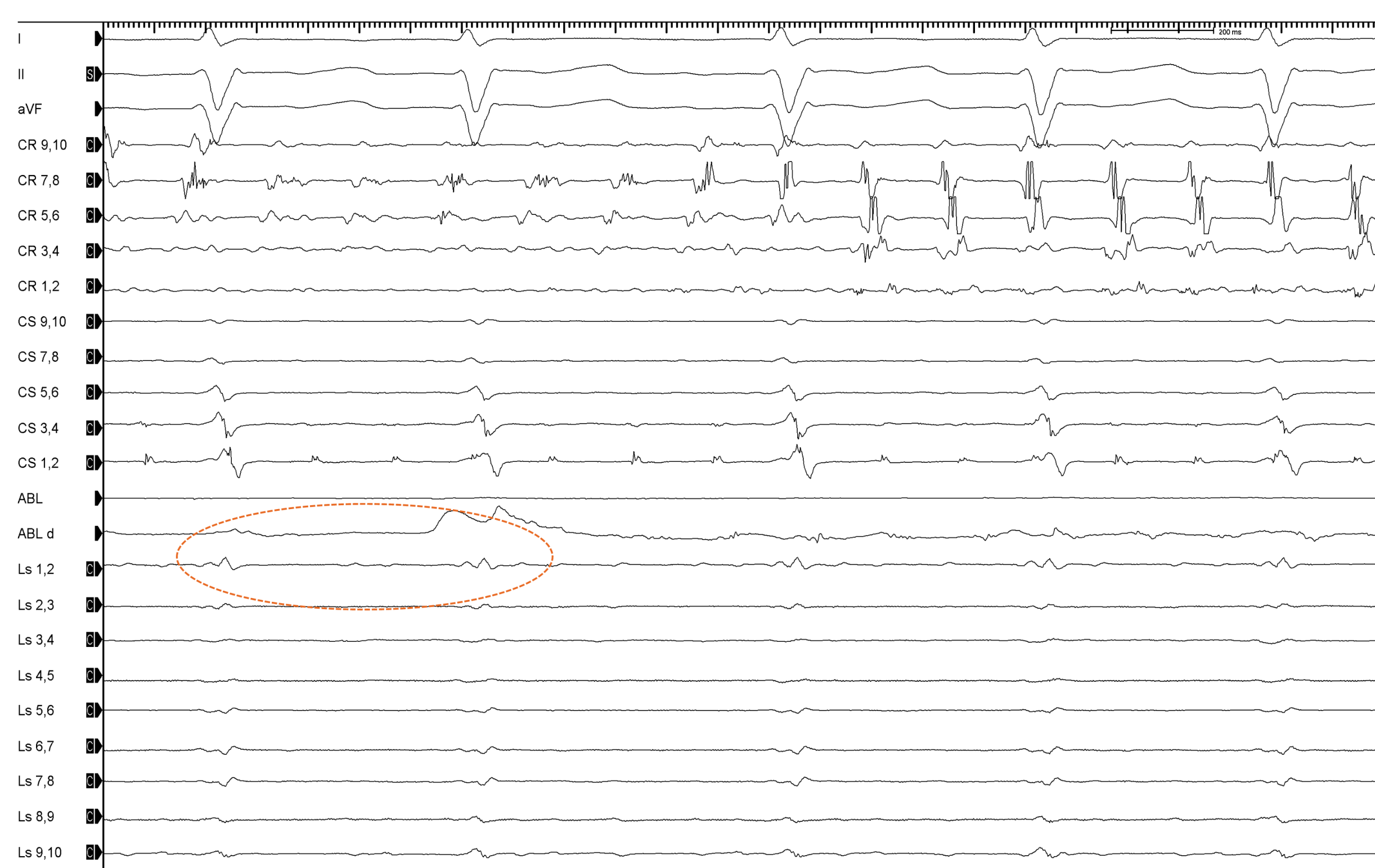
Mapping was performed in the left atrium using a 10-pole circular mapping catheter with 6-mm interelectrode distance and a 10-pole decapolar catheter with 2-mm interelectrode distance placed in the coronary sinus. Ten bipolar EGMs, formed by coupling adjacent electrodes, were acquired with the following settings:

- CardioLab: 1 kHz sampling frequency, filtered between 30-500 Hz, with 5000 gain and notch pass filter on
- PURE EP, 2 kHz sampling frequency, filtered with an high pass of 30 Hz, “gain” (i.e., zoom) 2.88 to 4.0, no notch pass filter

Of note, polarity of intracardiac signals is inverted on the two systems as is the order of distal and proximal ablation signals. Signals are displayed with a 100 mm/sec sweep speed in both systems.

Results

CardioLab

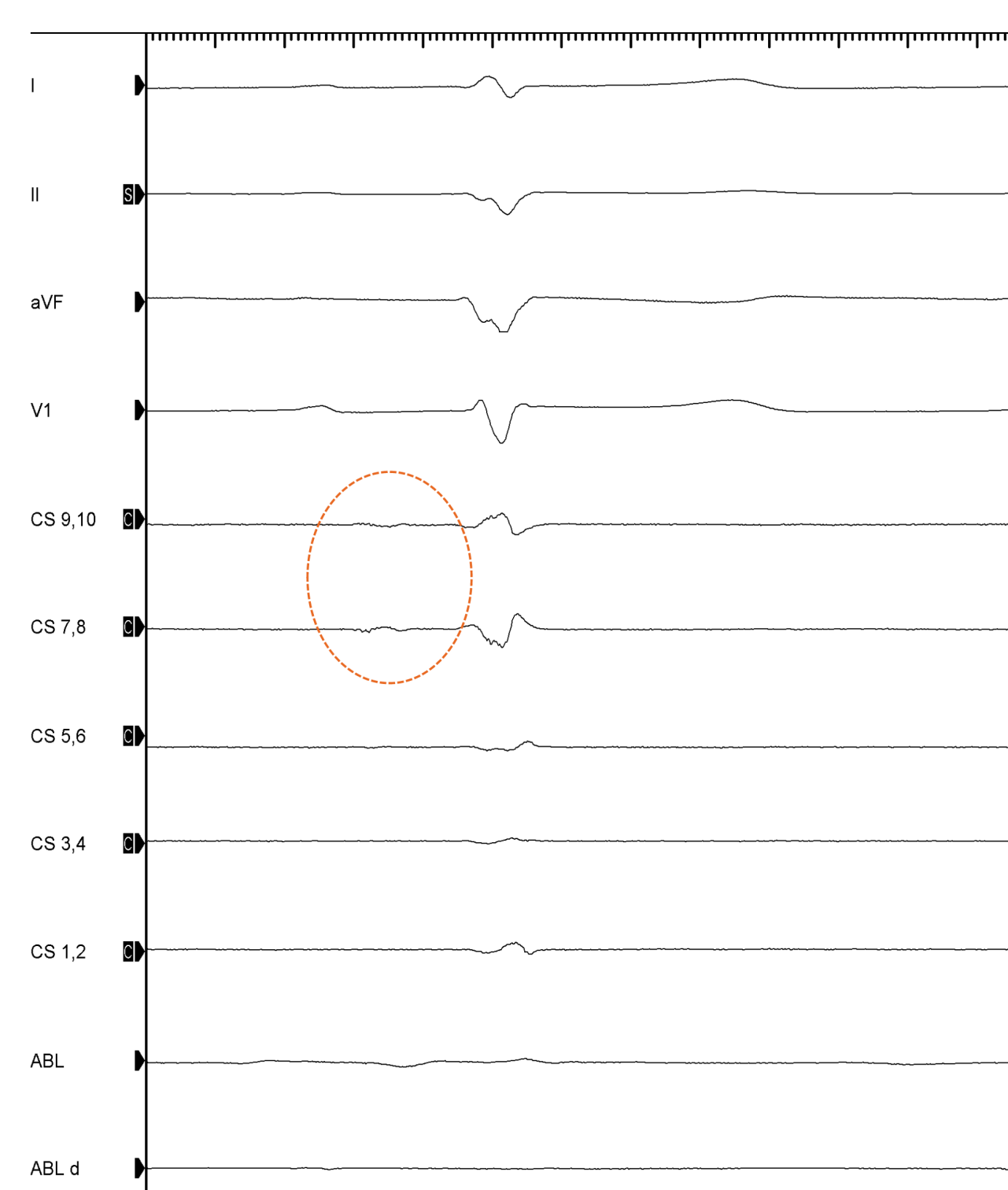


BioSig



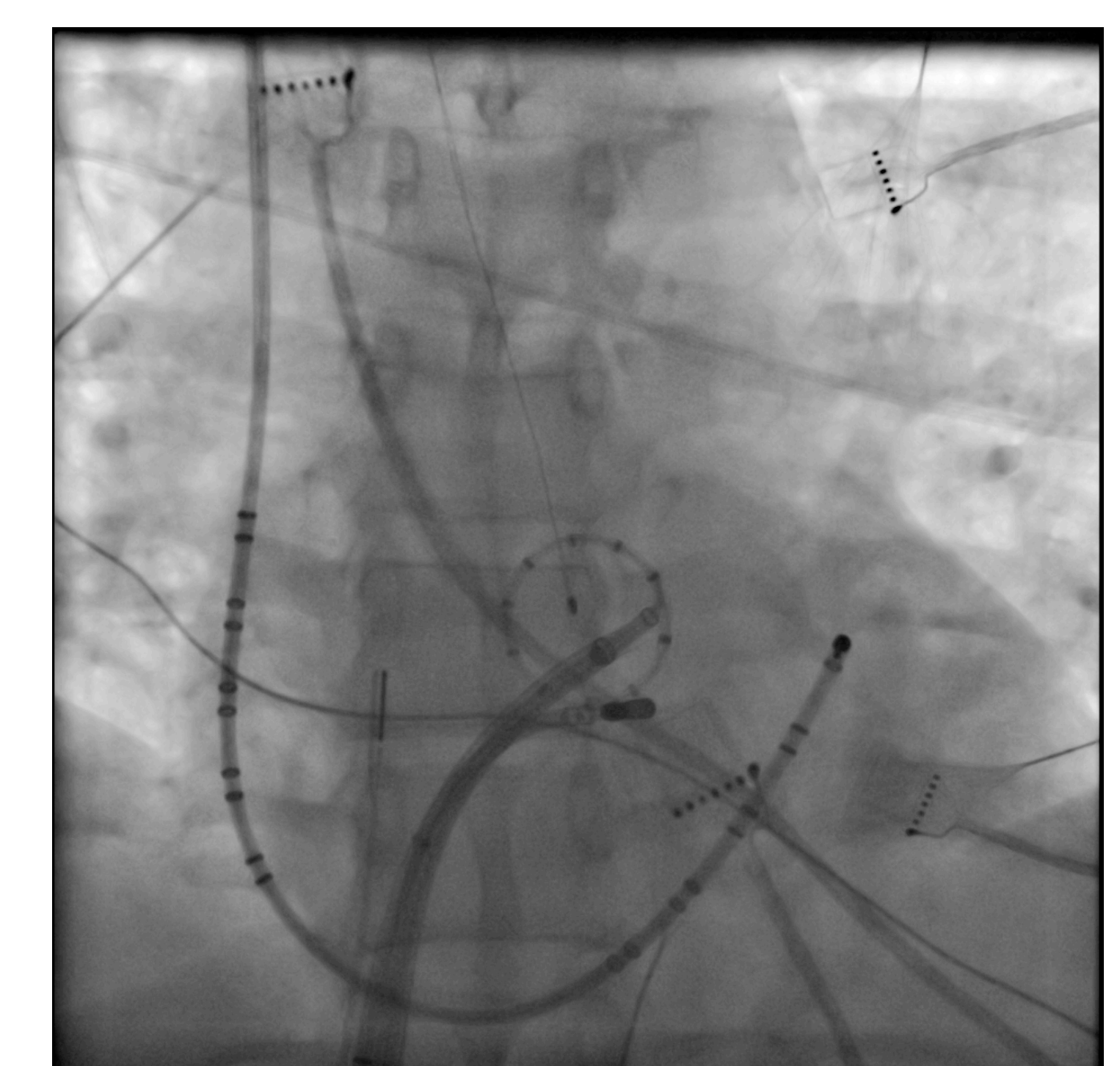
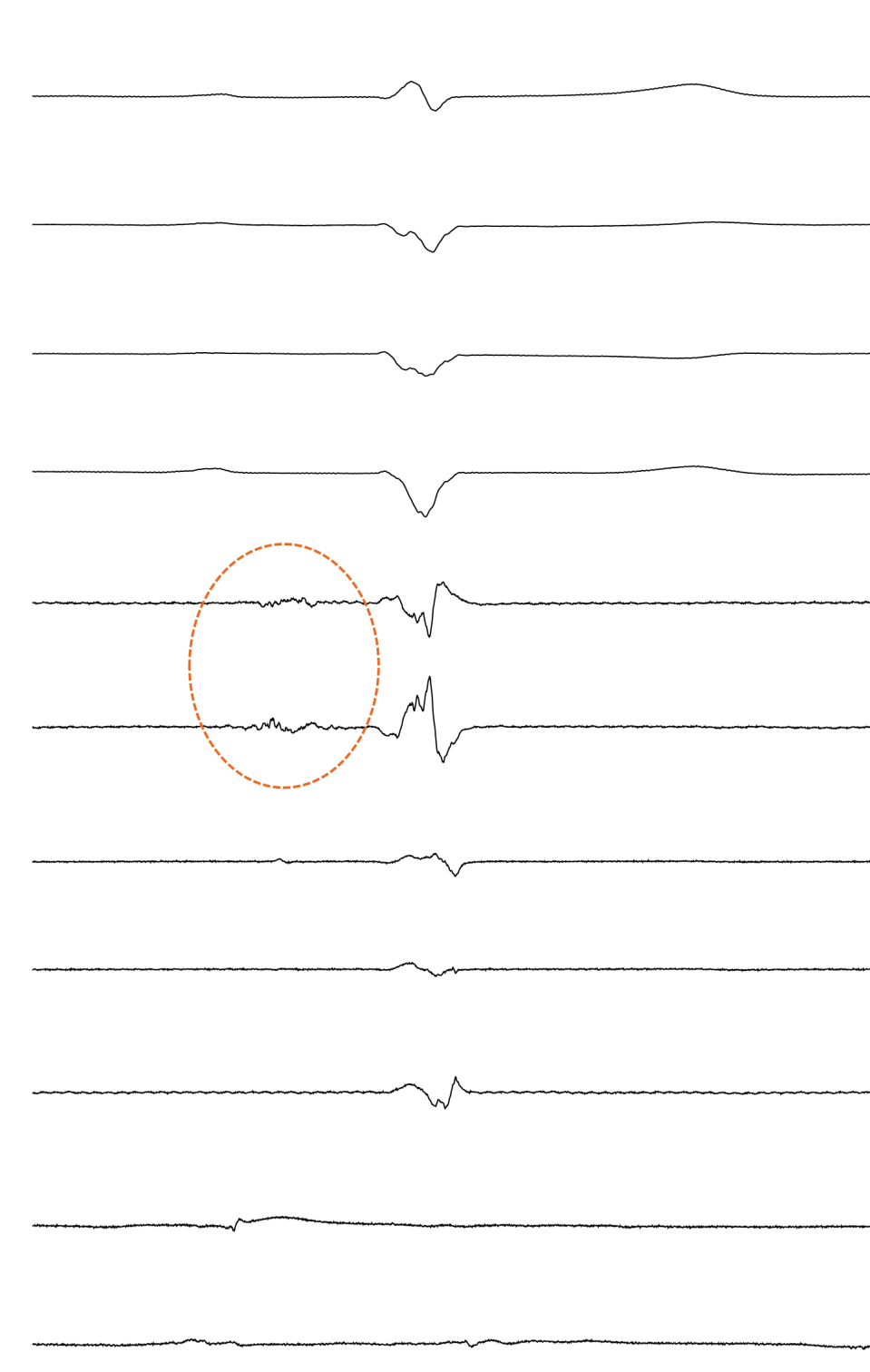
complex left atrial electrograms as recorded by the circular mapping system placed in the posterior wall of the left atrium in a patient undergoing first time ablation of persistent AF

CardioLab



electrograms in the proximal coronary sinus as recorded by a decapolar catheter in a patient undergoing a repeat ablation of persistent AF; of note, the coronary sinus was isolated in a previous ablation

BioSig



example of positioning of the circular mapping catheter and the decapolar catheter during mapping in the posterior wall and coronary sinus

Conclusions

On a side by side, subjective, qualitative comparison, processing of the same signals on PURE EP resulted in better resolution of local, low voltage, fractionated electrograms.

Disclosures

Amin Al-Ahmad and Andrea Natale received honoraria from BioSig.