

Table 1. Selected ablation studies utilizing local impedance with the MiFi™ OI ablation catheter

Study	Study type	N	Significant findings
Sulkin et al. 2018 ⁴	Porcine, in vitro and in vivo	N/A	In-vitro: baseline LI correlates with tissue contact, unaffected by catheter orientation In-vivo: LI correlated better to lesion depth (R ² 0.82) and diameter (R ² 0.64) than GI (R ² 0.58 and 0.44 respectively) Larger contrast between blood pool and myocardium using LI (67.5 Ω and 119.7 Ω, respectively) compared to GI (100.5 Ω and 123.8 Ω, respectively) Larger drop range with ablation for LI than for GI (62 vs 14 Ω, respectively) Largest LI drop in the absence of tissue damage was 12 Ω Steam pops were associated with higher baseline LI (median 148 Ω) and LI drop (median 59 Ω) Smallest LI drop associated with a steam pop was 37 Ω
Martin et al. 2018 ⁸	Observational, first-in man, redo AF and focal and re-entrant substrates	18	Stronger correlation between maximum EGM amplitude and baseline LI (r=0.53) than GI (r=0.33) Correlation between baseline LI and maximum LI drop (r=0.64) stronger than between baseline GI and GI drop (r=0.31) Absolute and % LI drop was higher in successful lesions than in unsuccessful ones (median 14.6 Ω vs 6.8 Ω, 14.2% vs 7.5%, respectively) LI of dense scar less than LI of blood pool
Gunawardene et al. 2019 ⁹	Observational, redo AF/AT ablation	25	Baseline LI higher in high voltage areas than low voltage areas Mean LI drop greater than GI drop during ablation (13.1 vs 6.1 Ω) Correlation between baseline impedance and subsequent drop stronger for LI (R ² 0.41) than GI (R ² 0.06) Ablation beyond LI or GI plateau did not result in further impedance drop Single case of cardiac tamponade associated with a rapid LI drop of 45 Ω
Das et al. 2021 ⁷	Prospective single-arm multicentre observational study, de novo PVI for pAF, LI-blinded	60	Mean baseline LI 107.9 ± 16 Ω, LI drop 19.8 ± 11.1 Ω Correlation between baseline impedance and subsequent drop stronger for LI (r=0.66) than GI (r=0.34) Median LI drop larger for areas with acute conduction block than those with gaps (19.8 vs 10.6 Ω respectively for ILD ≤ 6 mm) ROC analysis of optimal LI drop for ILD ≤ 6 mm: 15.6 Ω (AUC 0.82, PPV 97.4% for acute conduction block), compared with optimal GI drop: 7.9 Ω (AUC 0.75, PPV 95%)
Solimene et al. 2021 ⁶	Observational multicentre registry, de novo and redo PVI, LI-guided	153	62.7% de novo PVI, no difference in baseline LI in de novo PVI group Mean baseline LI 105 ± 15 Ω, LI drop with ablation 13 ± 8 Ω, GI drop 4.2 ± 5 Ω Absolute impedance drop greater for successful lesions (LI 14 ± 8 Ω, GI 4.3 ± 5 Ω) than for unsuccessful lesions (LI 6 ± 4 Ω, GI 3.1 ± 5 Ω). Mean 1 year AT/AF recurrence rate 11.8%

AF – atrial fibrillation; AT – atrial tachyarrhythmia; AUC – area under curve; GI – generator impedance; LI – local impedance; pAF – paroxysmal AF; PPV – positive predictive value; PVI – pulmonary vein isolation; ROC – receiver operator characteristics