Evone® Flow-Controlled Ventilation during percutaneous interventional radiology procedures: A Clinical Feasibility and Safety Assessment

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Objectives: Evone® is a flow-controlled ventilation (FCV) device that actively removes air from the lungs using a small-bore cuffed tube (Tritube). This constant flow ventilation enables protective patient ventilation with minimal diaphragm movement and smooth motion of abdominal organs.

The objective of the study is to evaluate feasibility and safety of Evone® FCV in percutaneous interventional radiology procedures.

Patients and methods: Patients who underwent percutaneous procedures between 01/01/2022-30/04/2023. Exclusion criteria: age < 18, no contraindications for percutaneous procedures. MDMT consensus and written consent was obtained before the procedure. Primary endpoint: safety, feasibility, and technical success, defined as the biopsy/ablation of the target lesion. Secondary endpoints: procedure time, patient dose, hospitalization. Adverse Events (AEs) were classified by validated 2023 SIR Classification.

Results: During this time laps 40 percutaneous procedures were performed in 20 patients (13 males) under general anesthesia with Evone® system in 22 treatment sessions. Median age was 66.2 years (range 47–83 years). Lesions: 14 in kidney (9 left, 5 right), 7 hepatic, 3 pulmonary. Median 2 procedures per patient and 1.7 procedures per lesion (24 lesions). Procedures: 20 biopsies, 16 Microwave Ablation (MWA), 2 Radiofrequency Ablation (RFA), 2 Cryoablation. Technical success: 100%. Median time per session: 83 minutes. Median DLP per session: 2294.1 mGy/cm. AEs rate per procedure: 15%. Mild AEs: 7.5% (1 local pain, 2 PNX not treated). Moderate AEs: 7.5% (2 urinary tract infection, 1 acute urinary retention, both successfully treated). Three patients had day hospital procedures. Median hospitalization per session: 64.4 hours, with 1 patient being hospitalized for 360 hours.

Conclusion: Evone® FCV system improves conditions in IR procedures by reducing organ motion and providing safe ventilation.

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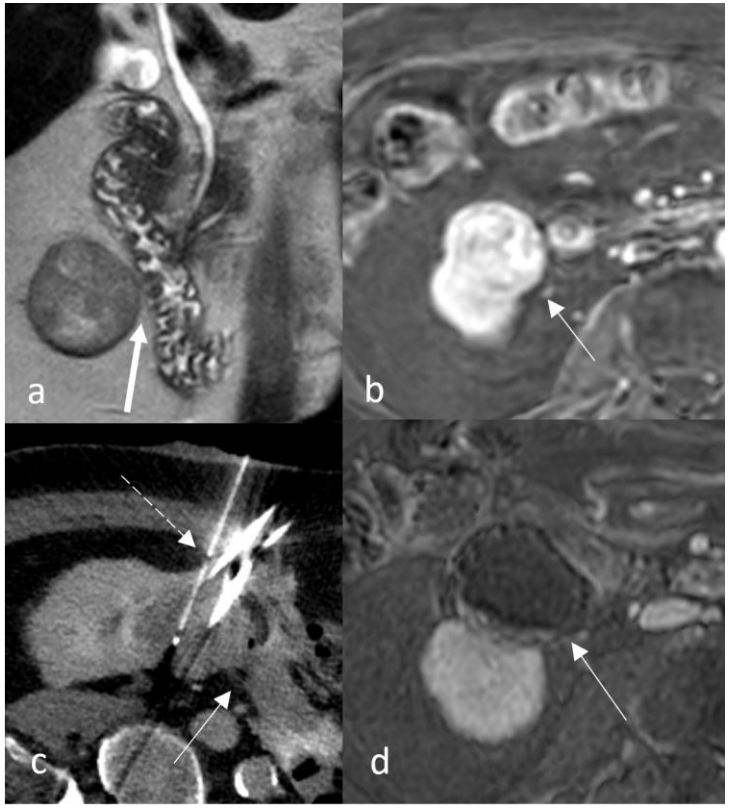
Photograph of the Evone ventilator showing time course for mainstream capnography, tracheal pressure and inspiratory volume.



a + b - renal lesion (arrow) showing with contrast enhancement (CE) in contact with duodenum (biopsy proven RCC); **c** -after hydroxy dissection (bold arrow) cryoablation of the lesion (dotted arrow) is performed; **d** - MRI follow-up at 3 months showing complete ablation (no CE of the ablated lesion)