Clinical Outcomes After ICU Avoidance In Patients Undergoing The Wolf Procedure

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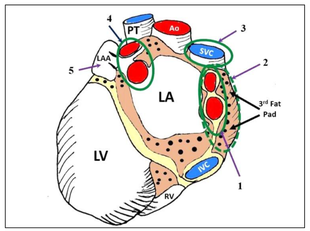
Background

- The **Wolf procedure** (stand-alone off-pump, minimally invasive bilateral pulmonary vein isolation, partial cardiac denervation, LAA closure) is a **safe and effective treatment strategy** for lone AF.
- **Enchanced recovery after surgery** (ERAS) protocols aim to **reduce intensive care utilization, hospital lenght of stay and healthcare costs** while maintaining postoperative safety.
- In contrast to catheter ablation, which is commonly associated with next-day discharge, minimally invasive surgical ablation has traditionally required routine postoperative ICU admission.
- The **impact of avoiding routine ICU utilization** on perioperative outcomes following stand-alone minimally invasive surgical ablation remains poorly defined.
- We compared **in-hospital outcomes before and after implementation of a no-ICU recovery protocol** in patients undergoing the Wolf procedure.

Wolf procedure

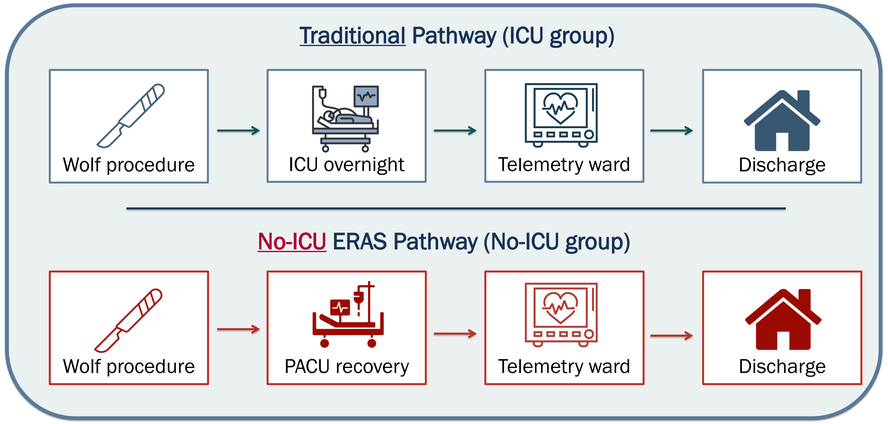


1. Pulmonary Vein Isolation
2. Partial Cardiac Denervation
3. LAA closure

Methods

- Retrospective, single-center study
- All consecutive patients (***n*=358**) included who underwent the Wolf procedure between May 2020 and December 2023 (Covid era)
- Patients were stratified according to postoperative recovery pathway:
  - → **ICU group** (before no-ICU ERAS protocol)
  - → **no-ICU group** (after protocol implementation)
- **Primary endpoints:** in-hospital cumulative adverse events (STS variable), hospital LOS, 30-day readmission, and 30-day mortality.
- **Exploratory hospital cost analysis was performed** using institutional per diem ICU and ward rates, excluding professional fees.
- Statistical analysis: t-test/Mann–Whitney U-test, χ^2/Fisher's

Results



Key findings

Outcomes	ICU (*n*=65)	No-ICU (*n*=293)	p value
ICU stay (hours)	25.4 (21.7-28.1)	0 (0-0)	**<0.001**
Readmission to ICU	0 (0)	3 (1)	1.000
In-hospital events	7 (10.8)	19 (6.5)	0.287
Hospital LOS (days)	3 (2-4)	3 (2-4)	0.342
30-day readmission	6 (9.2)	25 (8.5)	0.810
30-day mortality	0 (0)	1 (0.3)	1.000

Estimated cost reduction: ~$1,180/patient

- A total of **358 consecutive patients** were included,
- Baseline characteristics were comparable, median age was 68 years (IQR:63-73) and 45% were female (*n*=162).
- 99.2% of the patients were extubated in the operating room, 0.3% of the patients required reintubation.
- No increase in in-hospital adverse events, stroke (*n*=1 vs *n*=2), hospital LOS or 30-day readmission.
- ICU utilization decreased from 25.4 hours to 0 hours.
- These findings remained consistent after multivariable adjustment for clinically relevant covariates.
- ICU avoidance was associated with an estimated net hospital cost reduction of approximately $1,180 per patient.

Key component of the No-ICU ERAS protocoll

- OR extubation
- Telemetry monitoring, and AF prevention
- No routine Swan-Ganz use
- Avoid intraop nerve damage, use multimodal analgesia
- PACU recovery
- Early ambulation

Conclusions

- No-ICU recovery after the Wolf procedure eliminated routine ICU utilization without increasing perioperative morbidity, readmission, or mortality.
- Avoidance of ICU utilization, with preserved hospital length of stay was associated with improved resource efficiency and reduced hospital costs, supporting the safety and value of ERAS pathways in this population.

Disclosures: Dr. Randall K. Wolf is a consultant to the AtriCure, Inc. engineering team. This study was funded, in part, by support from AtriCure, Inc.