Hybrid Management of Life-threatening Complications After TAVI: A Single-center Experience

Muradym Murzagaliyev, PhD, MBA · Head of Cardiac Surgery, UMC Heart Center Astana · Astana 2026

UMC
UNIVERSITY
Medical Center

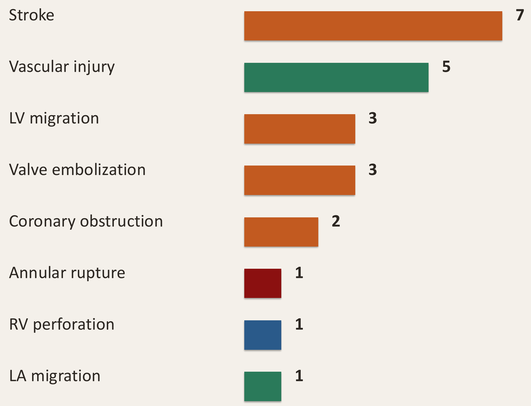
BACKGROUND

TAVI volume is growing globally. Kazakhstan (ESC atlas) still has low rates vs Western Europe, highlighting the importance of safe expansion.
Life-threatening complications are rare but demand instant hybrid rescue.
UMC Astana is Kazakhstan's leading TAVI centre (programme since 2012).

UMC PROGRAMME (2012–2025)

1,180 Total TAVI performed	**23** Major complications
2.0% Complication rate	**2012** Programme start year

COMPLICATIONS (N=23)



1 Case 1: Valve Migration into LV

Patient K., 69 yo, male

Dx: Aortic regurgitation stage D (AHA/ACC); bladder cancer (high surgical risk)

Complication: TAVI with Myval #27.5 → migration into LVOT intraprocedurally. Second valve (#29) advanced but haemodynamic compromise persisted.

Hybrid Rescue:

- VA-ECMO instituted peripherally
- Conversion to open heart surgery (CPB)
- Extraction of both dislocated valves

2 Case 2: Annular Rupture

Patient A., 74 yo, female

Dx: Bicuspid aortic valve (type 0), aortic stenosis stage D1; AV block; COPD

Complication: TAVI with Myval #24.5 → annular rupture detected intraprocedurally with haemodynamic instability.

Hybrid Rescue:

- Emergency median sternotomy
- Aortic root defect repaired with xenopericardial patch (EnCap)

3 Case 3: Valve Migration into LA

Patient N., 52 yo, male

Dx: Structural dysfunction: MV restenosis stage D; prior MV annuloplasty (Carbomedics #32), AVR (St. Jude #25), TV repair (2020)

Complication: Transcatheter valve migrated into left atrium; fluoroscopy confirmed LA position; haemodynamic collapse.

Hybrid Rescue:

- Emergency sternotomy under fluoroscopic guidance
- Transcatheter snaring & open surgical valve retrieval

THE HEART TEAM

- Cardiac Surgeon / HF Specialist
- Interventional Cardiologist
- Anesthesiologist
- Imaging Specialist
- Valve Coordinator
- Nursing Team
- Referring Cardiologist

TECHNICAL PEARLS

Readiness: Hybrid OR with perfusion, surgical & interventional tools on standby

Early recognition: Continuous monitoring, TEE, hemodynamic cues — act before collapse

Communication: Clear team leadership, role distribution, closed-loop communication

CONCLUSION

A co-located hybrid cardiac team with immediate surgical backup is essential when TAVI complications arise. At UMC Astana, this model has successfully managed 23 major complications across 1,180 TAVIs.

FUTURE DIRECTIONS

Next-gen devices

Rapid-deployment valves, percutaneous bailout tools, MCS innovations

Simulation & Training

Dedicated hybrid-OR drills, multidisciplinary team rehearsals, and simulation-based training programs

"TAVI is safe, but complications are unforgiving. Hybrid teams save lives. Preparation is not optional."