THE IMPACT OF A CHEST DRAINAGE SYSTEM ON RETAINED BLOOD-ASSOCIATED COMPLICATIONS AFTER CARDIAC SURGERY

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SUMMARY

Retained blood syndrome (RBS) after cardiac surgery is preventable. The study investigates the impact of different chest drainage modalities on RBS and associated complications after coronary artery bypass graft (CABG) surgery. Both active tube clearance (ATC) technologies and portable digital drainage systems (Thopaz$^+$) outperformed conventional drainage in reducing RBS interventions. Thopaz$^+$ provided additional benefits, including lower early re-exploration for bleeding, postoperative atrial fibrillation (POAF) incidence, packed red blood cells (RBC) transfusion needs, and resource utilization.

Active tube clearance and Thopaz$^+$ significantly reduce the risk of RBS and postoperative complications. Thopaz$^+$ shows benefits in reducing re-operations and atrial fibrillation. Effective drainage immediately after surgery is crucial for improved outcomes.

BACKGROUND

Mediastinal blood retention post-cardiac surgery can impair outcomes due to blood loss and fluid buildup. As most bleeding occurs within the first 4 hours, maintaining effective drainage during this period is crucial for patient recovery. This study evaluates how different drainage systems, including active tube clearance (ATC) and portable digital drainage systems (Thopaz$^+$), affect the incidence of retained blood syndrome (RBS) and related complications.

METHODS

The retrospective study included 1,049 patients with stable coronary artery disease undergoing CABG between 2016 and 2019. The study aimed to assess the impact on POAF, RBS, and other clinical outcomes. Three drainage systems were compared.

Intervention	Intervention	Control
Active Tube Clearance (ATC)	Portable Digital Drainage System (Thopaz$^+$)	Conventional Drainage Unit (CDU)
Jan – Jun 2016	Jan 2018 - Apr 2019	Jan 2016–Dec 2017
188	492	369

CONCLUSION

Advanced drainage systems like Thopaz$^+$ including immediately effective drainage of the posterior pericardium significantly reduce complications and improve patient outcomes in cardiac surgery, especially in reducing re-exploration for bleeding and POAF.

STUDY DESIGN

Retrospective Cohort Study

POPULATION

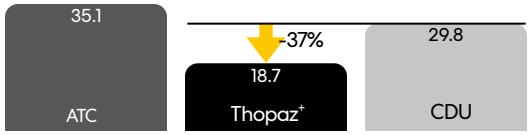
Location: Germany

1049 consecutive patients undergoing elective first time CABG using cardiopulmonary bypass with and without concomitant aortic or mitral valve procedure

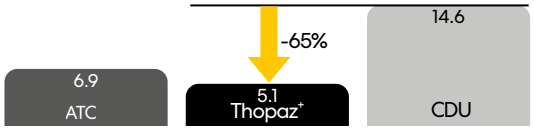
OUTCOMES

Primary Outcomes

- POAF was reduced by 37% from 29.8% in the CDU cohort to 18.7% in the Thopaz$^+$ cohort (OR 0.31, P<0.001).



- RBS associated interventions occurred less often in patients with Thopaz$^+$ (5.1%) than in those with CDU (14.6%, P<0.001).



Secondary Outcomes

- Hospital mortality rates showed no significant difference among the groups.
- Thopaz$^+$ was associated with fewer RBC transfusions, shorter ICU stays, and reduced hospital stays.
- Bleeding volumes were comparable between groups, though CDU had a higher tendency for coagulopathic bleeding.

ATC: Active tube clearance; CDU: conventional drainage unit; ICU: Intensive care unit; POAF: postoperative atrial fibrillation, RBC: Red blood cell; RBS: retained blood syndrome

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