Perioperative Deep Vein Thrombosis in PJI Surgery: Timing, Anatomical Distribution and Preoperative Risk Markers

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Introduction

- **Clinical relevance:** DVT may extend proximally and cause pulmonary embolism (PE).
- **PJI-related risk:** Infection/inflammation, immobility, and complex surgery may promote thrombosis.
- **Assessment challenge:** Pre-existing DVT may be misclassified, while clinical scores may not fully capture PJI-related inflammation and coagulation.

Objective

To characterize DVT timing and anatomical distribution and explore preoperative markers in PJI surgery.

Methods

1 Cohort

Design:
Single-center retrospective study

Definition:
ICM 2018-defined PJI

Analysis unit:
PJI-related surgical episode

Sample:
211 patients · 240 episodes

Multiple eligible surgeries per patient were retained.

2 DVT surveillance

Pre-op → POD1 → POD3 → POD7/ discharge

- **Routine bilateral ultrasound**
- Extra scans for DVT or symptoms

3 Outcomes

Pre-existing DVT:
confirmed before surgery

Incident postoperative DVT:
no pre-op DVT;
first detected after surgery

Anatomy:
proximal vs distal;
calf muscular veins recorded

4 Risk analysis

Variables:
Age · sex · BMI · Caprini · lnD-dimer
FIB · CRP · lnNLR · Alb · AST

Association:
Univariate logistic regression → OR (95% CI)

Discrimination:
ROC/AUC · DeLong test

Results

DVT burden and timing

33.3% Perioperative DVT 80 / 240

13.8% Pre-existing DVT 33 / 240

22.7% Incident postoperative DVT 47 / 207

Detected DVT (n = 80)

41.3% pre-existing | 58.7% incident postoperative

Anatomical distribution

Incident postoperative DVT (n = 47)

Distal DVT — 45 / 47 (95.7%)

Calf muscular veins — 43 / 47 (91.5%)

Overall DVT (n = 80)
Distal 74/80
Calf muscular 69/80
Proximal 9/80

1.9% Proximal DVT 4 / 207

Preoperative risk signals

Pre-existing DVT

ASSOCIATION	DISCRIMINATION
ln(D-dimer)	Caprini → + D-dimer
OR 2.39	AUC 0.613 → AUC 0.701
95% CI 1.26-4.53; P = 0.008	Further combinations: AUC 0.704-0.706

Incident postoperative DVT

ASSOCIATION	DISCRIMINATION
ln(D-dimer)	Caprini → + preop markers
OR 2.61	AUC 0.556 → AUC 0.649-0.666
Also associated: Age, FIB, CRP, ln(NLR)	Caprini: NS

Discussion & Conclusion

- **Substantial pre-existing DVT burden** and **distal predominance of incident postoperative DVT** in PJI surgery suggest a thrombotic profile distinct from conventional arthroplasty.
- Associations with D-dimer, FIB, CRP and NLR suggest that **infection-related inflammation and coagulation activation** may contribute to this thrombotic profile.

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