

# Prolonged Hypercoagulability Occurs Following Pelvic and Acetabular Fractures, as Defined by Serial Thrombelastography

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## Background

- Major orthopaedic fractures increase risk for venous thromboembolism (VTE)
- Pelvic and acetabular fractures have the highest incidence of VTE (12%), despite prophylaxis
- No specific prophylaxis recommendations, duration of hypercoagulability is unknown

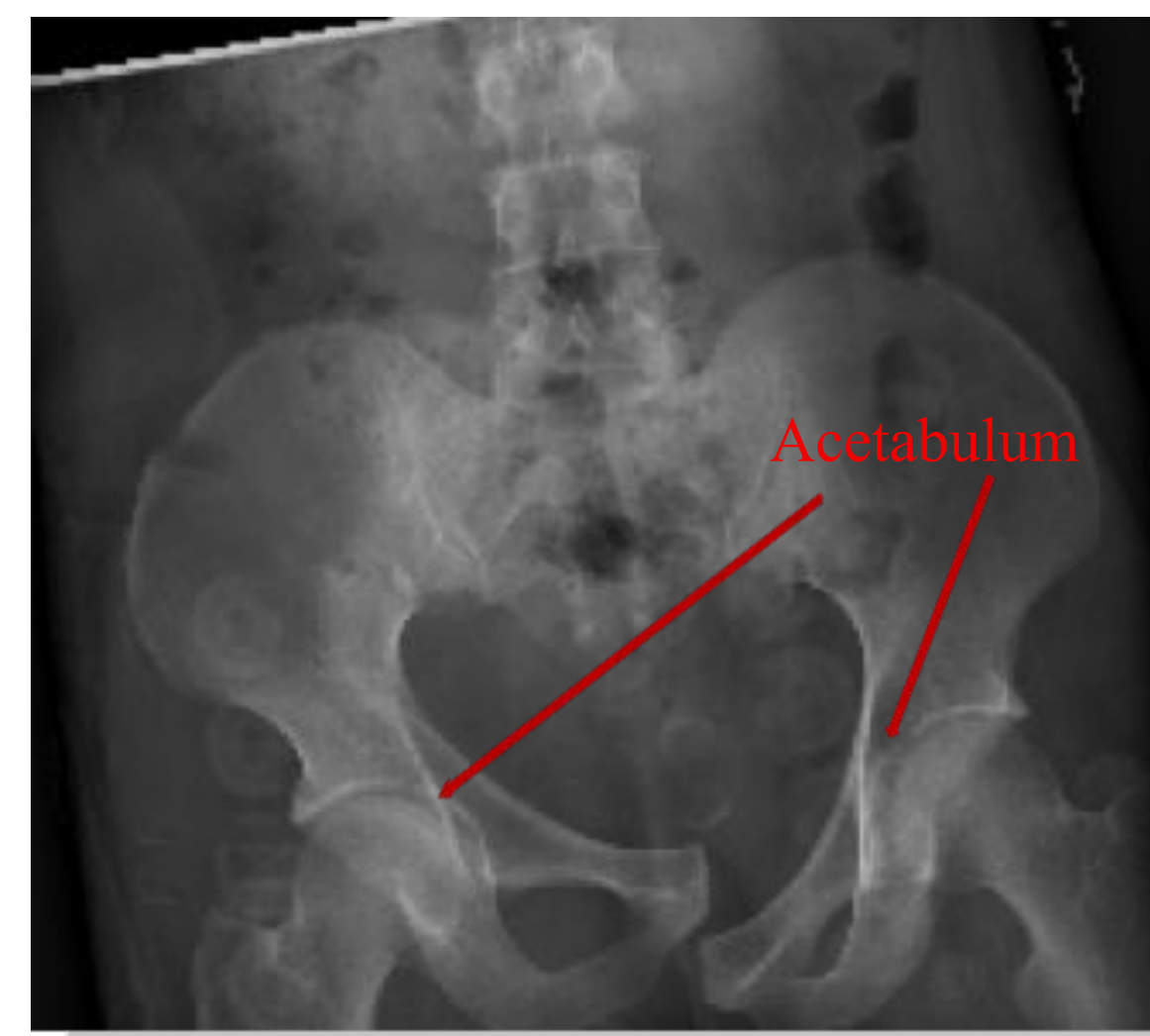


Image 1. Pelvic Fracture X-Ray

- Thrombelastography (TEG) is a whole-blood, point-of-care test evaluating clotting following trauma
- Maximal amplitude (MA) is an output from TEG analysis which can be used to quantify hypercoagulability

**Primary Objective:** To use serial TEG analysis to quantify the duration of hypercoagulability following pelvic and acetabular fractures

## Methods

- Prospective cohort study of adult patients admitted to Foothills Medical Centre (FMC) with surgically treatable pelvic or acetabular fractures
- Exclusion criteria: Current therapeutic levels of anticoagulation, bleeding disorders, burns >20% body surface, active malignancy, currently or expectant pregnancy within 3-months
- TEG analysis timepoints outlined in Table 1:

Table 1. Serial blood draw schedule for TEG analysis

Admission	Post-Operative Day (POD) 1, 3, 5, and 7	2-, 4-, 6-week and 3-month follow-up
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- Post-operative timepoints captured up to POD7 or discharge, whichever is sooner
- All patients received standardized prophylaxis for 28 days post-operatively

## Results

Table 2. Patient Demographics and Baseline Characteristics

Characteristic	No. (%) of Patients*
Total Patients	17
Median Age	54 (IQR [47, 61])
Female	3 (18)
Pelvic Fractures	9 (53)
Smoking Status	
Never Smoked	11 (65)
Past Smoker	3 (18)
Current Smoker	3 (18)
Comorbidities	10 (59)

IQR = Interquartile range  
\* except where otherwise noted

- 3 VTE events (all acetabular fractures, all males)
  - VTE 1 - POD1
  - VTE 2 - POD5
  - VTE 3 - 4-week
- Highest average MA values ( $74.0 \pm 2.0$ ) occurred on POD7
- 62.5% remained hypercoagulable at 4-weeks following surgery, when prophylaxis is stopped
- > 30% remained hypercoagulable at 6-weeks following surgery
- Almost  $\frac{1}{4}$  were still hypercoagulable at 3-months following surgery
- Significant difference in age between patients diagnosed with VTE ( $73.3 \pm 12.0$  years) and those without ( $46.5 \pm 17.0$  years)

## Discussion

- A substantial number of patients were still hypercoagulable at, and after, the time of prophylaxis discontinuation (4 weeks post-op)
- Prolonged hypercoagulability demonstrated by serial TEG analysis
- Low rate of loss to follow-up
- Limitation of a small sample size

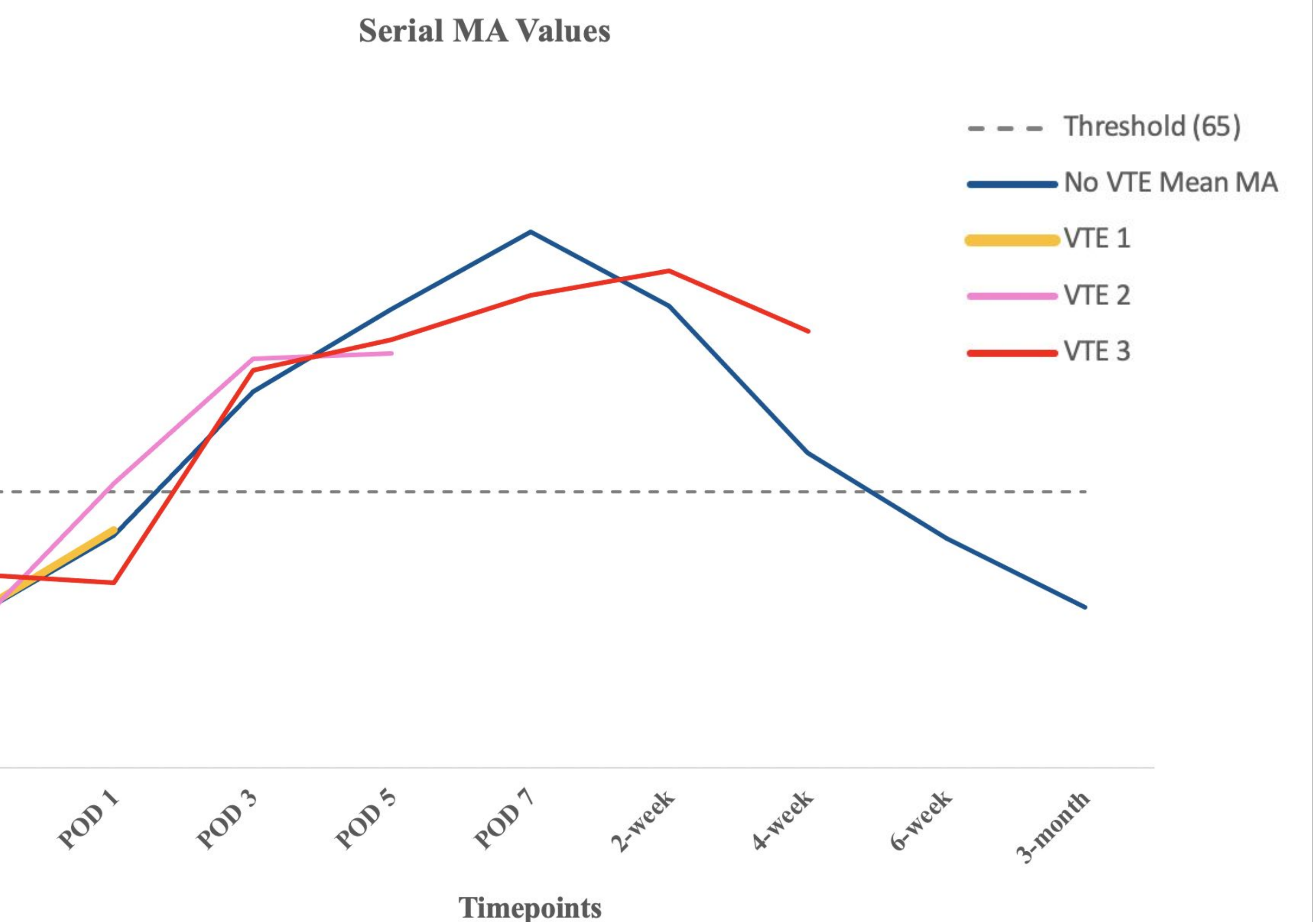


Figure 1. Mean maximal amplitude (MA) values on admission and over the study period.

Table 3. Hypercoagulability Summary by Timepoints

Timepoint	Number Hypercoagulable*	MA Value (Avg $\pm$ SD)
Admission	3/17 (18)	60.6 $\pm$ 5.3
POD 1	7/17 (41)	63.4 $\pm$ 3.5
POD 3	13/16 (81)	68.7 $\pm$ 3.2
POD 5	12/12 (100)	71.4 $\pm$ 2.9
POD 7	6/6 (100)	74.0 $\pm$ 2.0
2-week follow up	9/9 (100)	71.8 $\pm$ 2.8
4-week follow up	5/8 (63)	66.9 $\pm$ 6.1
6-week follow up	4/12 (33)	63.3 $\pm$ 5.7
3-month follow up	3/13 (23)	60.5 $\pm$ 6.6

\* % based on patient availability by timepoint

## Significance

Based on this evidence, a larger future study could be performed leading to **clinical recommendations regarding prophylaxis duration**, in this high-risk population.

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