



Accidental administration of 30,000 IU of unfractionated heparin during an elective lower segment caesarean section for placenta praevia

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Introduction:

- Human factors are well known to cause error in the clinical setting, particularly in a dynamic environment such as an operating theatre.
- With potential for significant morbidity and mortality, it is imperative to analyse critical incidents as a result of human error so that future occurrences can be minimised.

Case Report:

- We present the case of a 38-year-old female, with a history of placenta praevia, who presented for an elective lower segment caesarean section (LSCS) and was mistakenly administered 30,000 units of unlabelled, unfractionated heparin (UFH), as part of co-loading of intravenous fluids after neuraxial anaesthesia was performed.

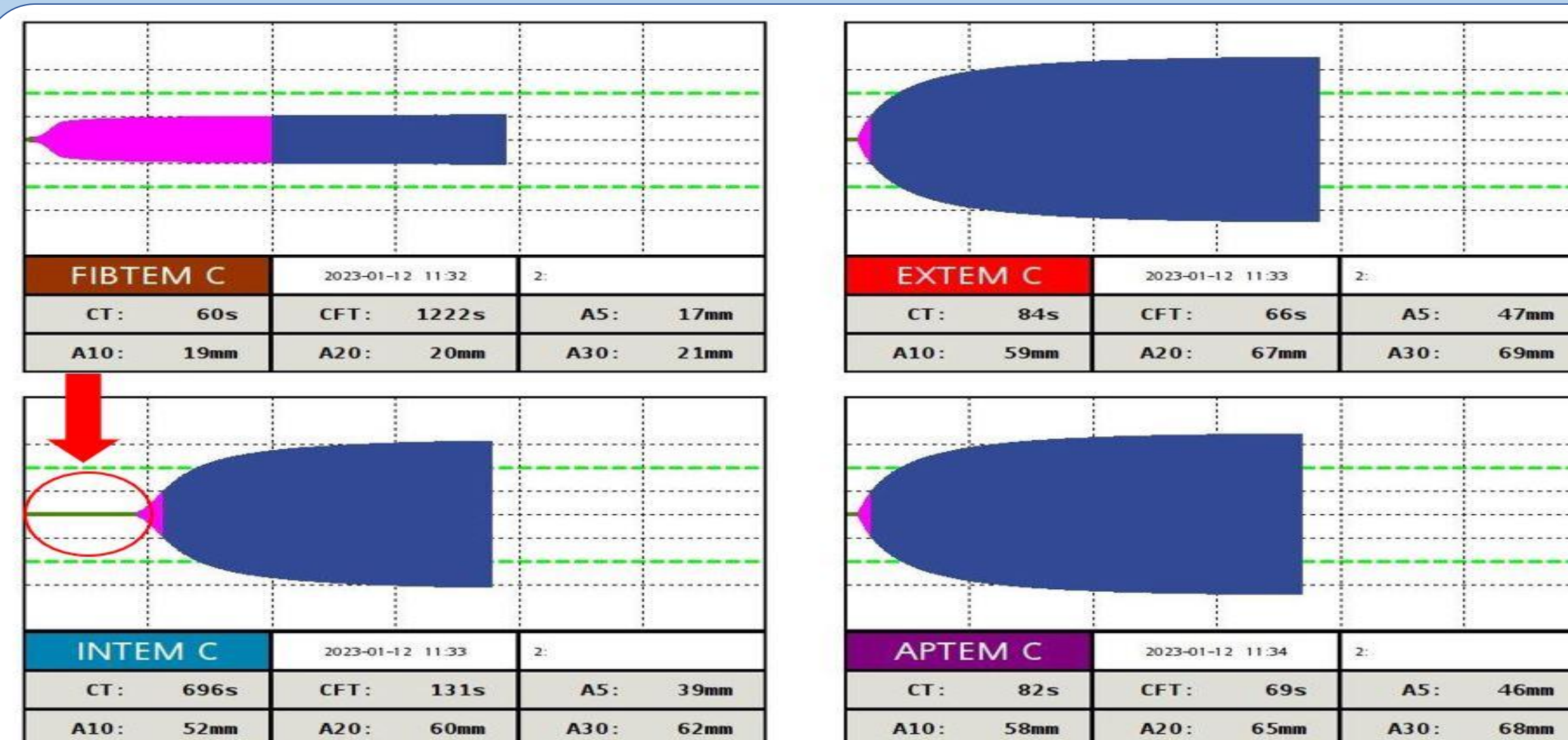


Figure 1 showing significantly prolonged clotting time of 696 seconds on INTEM analysis.

Timeline of Events

- 38-year-old female, with a history of placenta praevia, presented for an elective LSCS
- Cell salvage was set up in theatre due to the high risk of bleeding
 - 30,000 IU heparin added to 1 litre bag of 0.9% NaCl and hung on cell salvage machine – Not labelled
- Underwent routine IV access, monitoring, and sub-arachnoid block,
- Co-loaded with warmed 0.9% NaCl
 - No prewarmed Hartmann's solution available so prewarmed 0.9% NaCl solution used
- Prior to surgical start, nursing staff noticed that heparinised saline missing from cell salvage machine
- No labels present on saline bag - clinical suspicion that co-loading fluid was heparinised saline
- Case postponed
- Coagulation studies showed an unrecordable activated partial thromboplastin time (aPTT) and rotational thromboelastometry (ROTEM) showed a significantly prolonged clotting time (CT) on INTEM analysis of 696 seconds (normal CT 109–225s) (Fig 1).
- Consulted with Haematology. The patient was administered protamine sulphate and her coagulation studies were monitored to ensure no recurrent anticoagulation after reversal of UFH.
- Admitted to labour ward for CTG monitoring in the interim
- Regular neurological examination was performed and after four hours showed complete recovery of motor and sensory function.
- Ten hours following the initial error, the patient's coagulation studies had normalised, and she successfully delivered via LSCS under neuraxial anaesthesia.

Outcome:.

- Admitted to HDU post-operatively requiring Bakri balloon with a 1.7L blood loss.
- Uneventful course in HDU
- Open disclosure was conducted at the time of the initial drug error and apologies provided
- The patient and her partner were debriefed immediately after the incident and followed up over the postnatal period
- Ward follow up performed with no neuraxial complications
- Discharged home 5 days post-operatively

Root Cause Analysis

- Step 1: Identify the main problem – Medication Error
- Step 2: Identify the major factors
- Step 3: Take each major factor and identify possible factors contributing to the problem
- Step 4: Investigate the factors identified

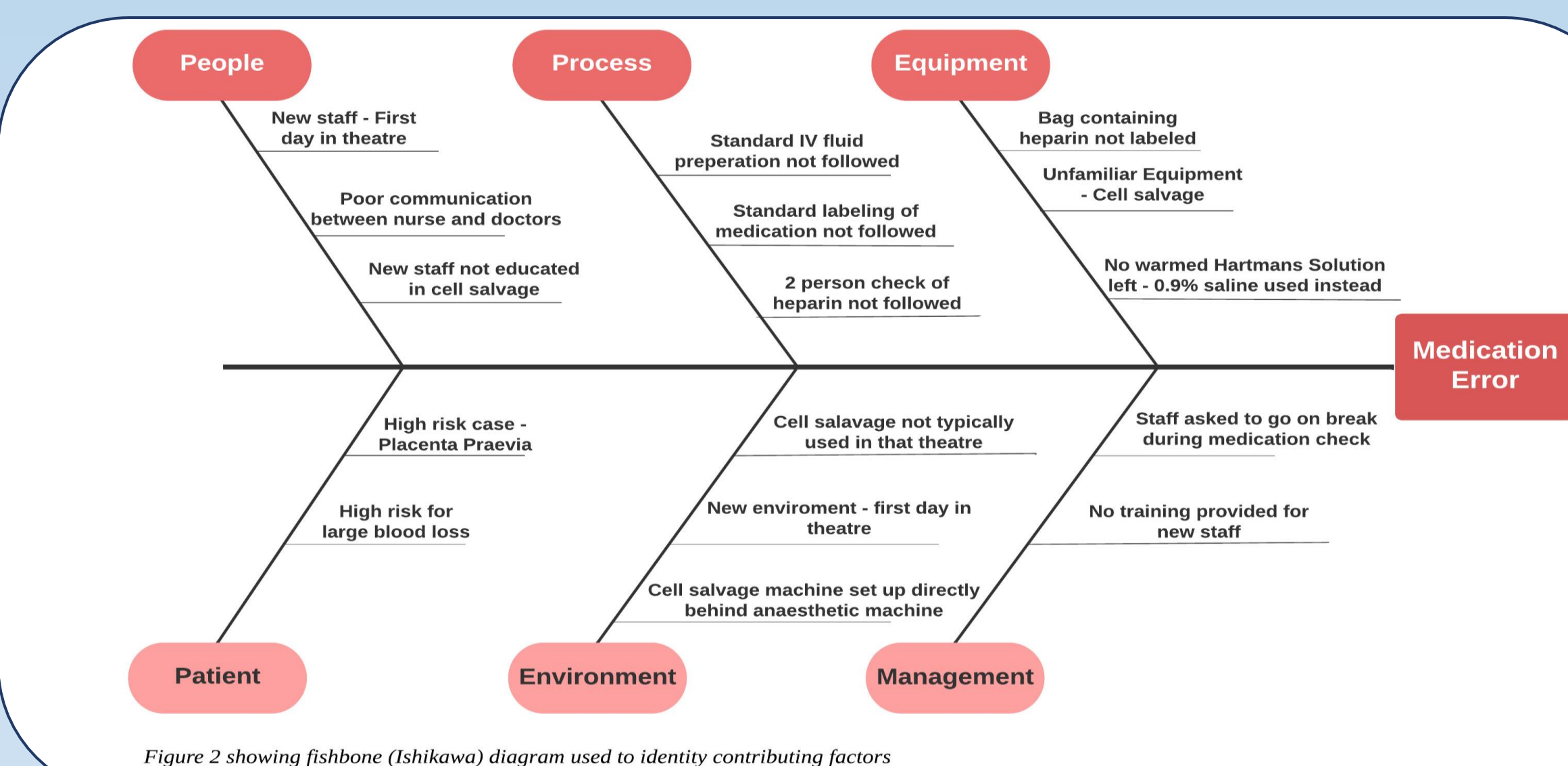


Figure 2 showing fishbone (Ishikawa) diagram used to identify contributing factors

Discussion:

- Our team utilised the fishbone (Ishikawa) diagram to analyse the contributing factors that led to this medication error [Figure2].
- We found the key contributing factors to include;
 - Poor communication between staff
 - Lack of education with rarely used equipment
 - New staff in an unfamiliar working environment
 - Individual human errors
 - Deviation from standardised protocol in both drug preparation and IV fluid preparation
- Following root cause analysis of this clinical incident
 - Extra education and training sessions provided for all staff on cell salvage machine
 - Training provided to theatre staff regarding preparation of high risk medication
- While it is not possible to fully eliminate all these factors, root cause analysis has been shown to minimise future adverse events and improve patient safety.

References

- Online library of Quality, Service Improvement and Redesign tools. Cause and effect (fishbone). Accessed 2 February 2023
<https://www.england.nhs.uk/wp-content/uploads/2021/12/qsir-cause-and-effect-fishbone.pdf>

