Letter to Editor/*Editöre Mektup*

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Surgical and Anesthetic Management of Postpartum Hemorrhage Forty-Five Days After Cesarean Section*

Sezaryenden Kırkbeş Gün Sonra Postpartum Kanamanın Cerrahi ve Anestezi Yönetimi

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Dear editor,

A cumulative blood loss ≥1,000 mL accompanied by hypovolemia within 24 hours after delivery regardless of the delivery route is defined as postpartum hemorrhage (PPH) which is called as primary PPH. However, secondary PPH occurs 24 hours after delivery up to 12 weeks postpartum which is more common during normal vaginal delivery but rarely seen after cesarean section (CS) (1). The PPH has been still the most common cause of maternal mortality and morbidity which has a rate of 13.1 in 100.000 live births in 2019 (2). The aim of this report is to address multidisciplinary approach to secondary (delayed) PPH in a patient 45 days after CS according to adapted massive transfusion protocol (MTP).

A 29-year-old parturient with abnormal bleeding was admitted 45 days after CS. Coagulation profile and fibrinogen before PPH diagnosis was not remarkable. The ultrasound was free of any retained placental products/subinvolution. The hemoglobin (Hb) decreased from 10.3 to 6.9 g dL^{-1}. After IV infusion of 20 IU of oxytocin/1000 mL Ringer's lactate, 0.2 mg of im methylergonovine, 100 µg in 10 mL carbetocin and 600 µg of transrectal misoprostol were administered. Meanwhile, IV tranexamic acid (TXA) (1 g) and fibrinogen concentrate (2 g) were given. Fibrinogen levels were 585 mg dL^{-1} (on admission), 247.8 mg dL^{-1} (after 1 g of TXA and 2 g of fibrinogen administration) and 198.7 mg dL^{-1} (before another 1 g of fibrinogen administration). After obtaining written informed consent, patient underwent emergency exploratory surgery. General anesthesia was performed with propofol rocuronium followed by 1 MAC sevoflurane in 50% O_2/air mixture plus remifentanil infusion using standard monitorization. Lateral hemostatic suturation and bilateral uterine and hypogastric artery ligations were performed. Following 6 U of red blood cells (RBC), 6 U of fresh frozen plasma (FFP) and 10 mL calcium 10% administration, Hb was 7.7 g dL^{-1} and platelet count was 237.000 μg^{-1}. One gram of fibrinogen concentrate was given to target FIBTEM A5 16 mm in ROTEM and >2 g L^{-1} (afterwards it reached to 303 mg dL^{-1}).

Delayed PPH after CS was managed by pharmacological (uterotonics, antifibrinolytic and procoagulants) and surgical (sutures and ligations of bleeding arteries) interventions. After TXA, use of fibrinogen along with RBC:FFP (1:1 ratio driven protocol) was guided with standard laboratory tests and ROTEM consecutively to increase Hb up to 9 g dL^{-1}.

We previously managed bleeding due to uterine atony/rupture after vaginal delivery by focusing on role of fibrinogen in the coagulation (3). Physiologically pregnant women have higher fibrinogen level and decreased fibrinolysis than non-pregnant population (4). Hereby, 1 g TXA and 2 g fibrinogen concentrates were given in the ward by the obstetricians before emergency surgery. We, anesthesiology team, managed goal directed coagulopathy therapy using ROTEM since fibrinogen level <2 g L^{-1} and/or FIBTEM A5 <12 mm are considered to be predictive of severe hemorrhage as stated in the recent Maternity and Obstetrics Guidelines of the Turkish Ministry of Health (5) (Figure 1).

In conclusion delayed (secondary) PPH was successfully managed by multidisciplinary team approach after early activation of adapted MTP that includes trigger and target values guided by ROTEM and/or standard tests for avoiding unnecessary transfusion that can possibly increase mortality and/or morbidity.

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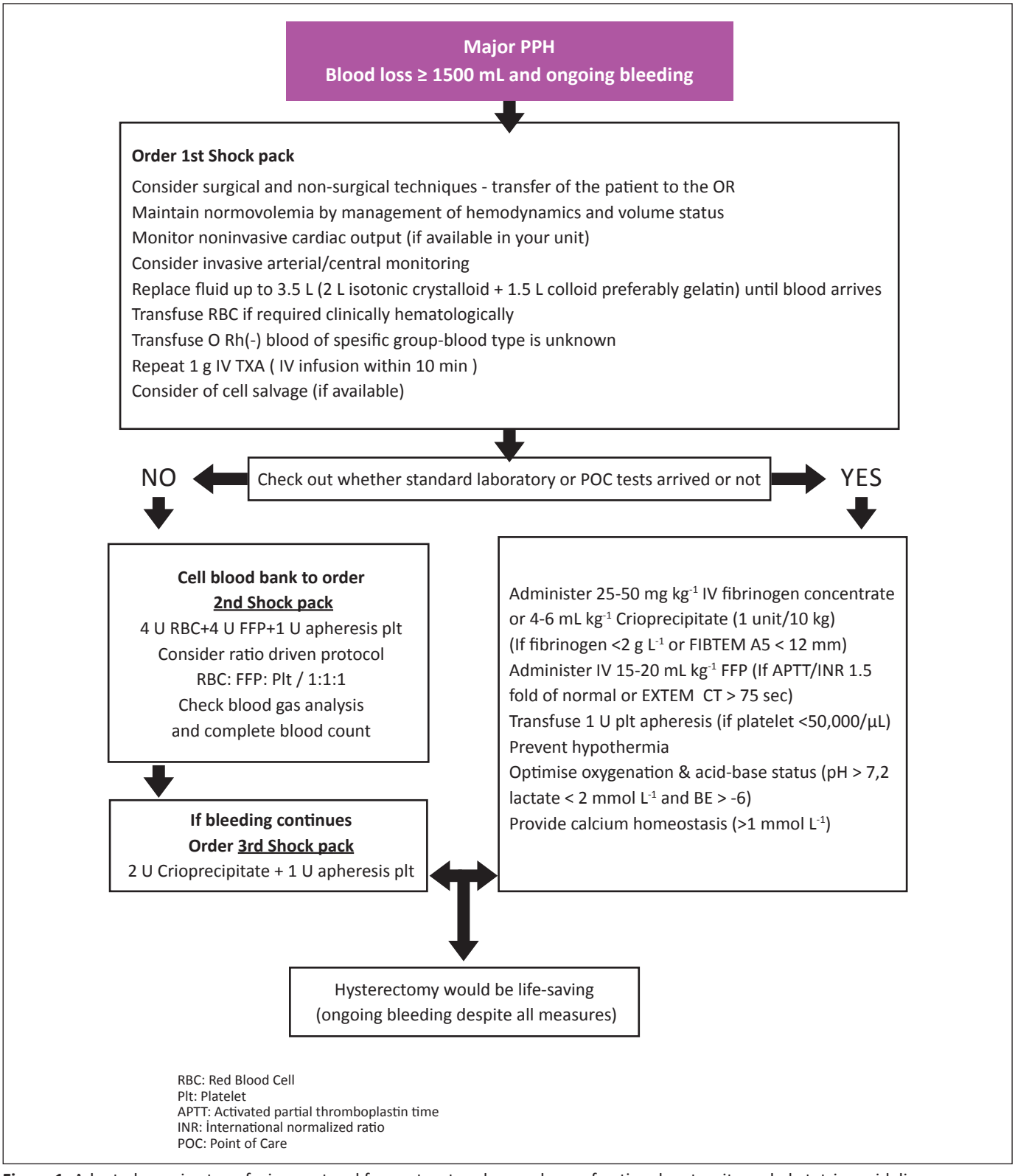

Figure 1: Adapted massive transfusion protocol for postpartum hemorrhage of national maternity and obstetrics guidelines.

AUTHOR CONTRIBUTIONS

Conception or design of the work: DBG, NCE, MFCA

Data collection: AB, EIB

Data analysis and interpretation: DBG, NCE

Drafting the article: DBG, NCE

Critical revision of the article: MFCA, DBG

Other (study supervision, fundings, materials, etc): AE, EIB

All authors (MFCA, NCE, DBG, AB, EIB, AE) reviewed the results and approved the final version of the manuscript.

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