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Case Report

Secondary postpartum hemorrhage after pineapple juice- a case report

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ABSTRACT

Postpartum hemorrhage (PPH) is defined as blood loss through the genital tract, exceeding 500 mL following vaginal birth and 1000 mL following caesarean section. PPH occurring between 24 hours to 12 weeks postpartum is defined as secondary PPH. PPH is the most common preventable cause of maternal morbidity and mortality. Detailed history and careful clinical examination can help in proper diagnosis. This is a case report of consumption of pineapple juice, that caused secondary PPH. Bromelain in pineapple juice is known to have proteolytic, fibrinolytic, anti-inflammatory and antithrombotic properties. It causes moderate prolongation of activated partial thromboplastin time (APTT), thus delaying coagulation. This action of bromelain was found to be concentration dependent. Prompt activation of the transfusion protocol can be lifesaving. Coagulation parameters should be monitored and respective blood products should be given. Thromboelastogram (TEG)/ Rotational Thromboelastometry (ROTEM) can be used for the same. To conclude, a multi-disciplinary approach is ideal. Mechanical and medical management of PPH should be started simultaneously. This should be followed by surgical procedures. If interventional radiology procedures like uterine artery embolization are available, they can be utilised, without risking the life of the mother.

Keywords: APTT, Uterine artery embolisation, Anti-thrombotic, Bromelain, PPH

INTRODUCTION

Postpartum hemorrhage (PPH) is defined as blood loss through the genital tract, exceeding 500 mL following vaginal birth and 1000 mL following caesarean section, with signs and symptoms of hypovolemia.[1] Primary PPH occurs within 24 hours of delivery, while secondary PPH is defined as excessive blood loss from the genital tract after 24 hours of delivery, until 12 weeks postpartum.

According to WHO reports (March 2023), about 14 million women experience PPH annually, resulting in about 70,000 maternal deaths. The incidence of secondary PPH has been reported to be 0.2-0.8%.[2]

The commonest cause of PPH is uterine atony (70%), where the uterine muscles fail to contract and retract after delivery. The other causes include genital tract trauma (10%), retained products (20%) and rarely coagulopathy (<1%). The common differentials to be considered in case of secondary PPH include retained placental tissue and membranes, endometritis, placental site trophoblastic tumour (Gestational Trophoblastic Disease) and arterio-venous malformations (pseudoaneurysm of uterine artery).

Pineapple juice contains an extract Bromelain, which has proteolytic, fibrinolytic, anti-inflammatory and anti-thrombotic properties.[3] Bromelain can be extracted from the stem and fruit of pineapple plant.[4]

Prompt identification and management of a case of secondary PPH due to this content in pineapple juice, has been discussed here.

CASE REPORT

A 28-year-old P1L1 was referred from a local hospital on post operative day- 9 of elective LSCS (Indication: Macrosomia), with heavy bleeding per vaginum for the past two hours. It was fresh blood, soaking a large napkin

in less than an hour. No history of any trauma or intake of anticoagulant drugs. No history of fever, foul smelling discharge or abdominal pain. She did not give any history suggestive of bleeding disorders. Her caesarean section was uncomplicated. She gave history of intake of 3 glasses (900 mL) of fresh, home-made pineapple juice 4 hours prior to onset of bleeding. From the referring centre, she was given Oxytocin 20 units infusion, 1 dose of methyl ergometrine and rectal PGE1 400 mcg, one pint of PRBC transfusion was started, and was shifted after uterine packing.

On admission, she was pale, hypotensive and tachycardic. Pulse rate was 124/minute. Blood pressure was 100/40 mmHg. Temperature at admission was 100°F. Abdominal examination revealed a healthy healing scar. Uterus was not flabby, but sub-involuted. A completely soaked uterine pack was removed. Local examination revealed bouts of fresh bleeding through the internal OS. Vulva, vagina and cervix were normal.

Investigations were sent. Medical management was continued with 2 more doses of methyl ergometrine 0.2 mg, 3 doses of carboprost 250 mcg and rectal PGE1 1000 mcg, in spite of which bleeding persisted. Meanwhile, packed red cell transfusion was started (total of 4 pints transfused). Ultrasonography revealed no retained products, but intracavitary blood was noted. Thrombo-elastography (TEG) reported deranged coagulation, FFP and cryoprecipitate, 2 units each, were also transfused. Labs reported hemoglobin 6.9 g/dL, hematocrit 19.5%, Platelet count 1.85 lakhs, WBC count-6700/mm^3, PT-15.1 sec, INR-1.17, APTT-37.2 sec, fibrinogen 265.1 mg/dL, D-dimer >20 mcg/dL. CRP and procalcitonin were negative. Hepatic and renal function tests were reported to be normal. Urine HCG was also negative.

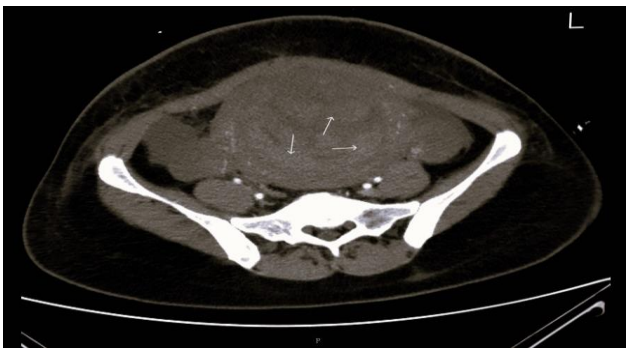

Figure 1: CT abdomen with contrast. (Arrow marks represent haemorrhagic products filling endometrial cavity).

She was empirically started on broad spectrum antibiotics. In view of failed medical management with ongoing blood loss, but stable general condition, she was planned for interventional radiological management with uterine artery embolization. Contrast enhanced CT imaging was done (Figure 1) and proceeded with embolization of bilateral uterine arteries, following which her bleeding was controlled.

She was monitored and stabilized in the intensive care unit. Her coagulation profile improved. She did not have further episodes of bleeding.

DISCUSSION

Bromelain can be extracted from the stem and fruit of pineapple plant.[4]

Though commonly prescribed doses of Bromelain range from 120 to 1000 mg/day, doses up to 250 mg/day have been considered safe. 100 gram of pineapple peel would generate ~150 mL of bromelain, 900 mL of fresh pineapple juice, containing 300 mL pineapple extract, contains approximately 630 mL Bromelain, which is 3 times the safe dose.

Bromelain is a cysteine protease. That is, it breaks protein chains wherever they have a cysteine amino acid.[5]

Significant amounts of orally ingested bromelain have been found to be directly absorbed into the bloodstream unchanged. It increases the conversion of plasminogen to plasmin, which in turn breaks down fibrin clot to fibrin degradation products (FDP). Bromelain also reduces levels of clotting factors (prothrombin and factor X) and the serum concentration of fibrinogen, thus, increasing the proteolytic and fibrinolytic blood activity for 6-9 hours.[6,7]

By suppressing the ADP-induced platelet aggregation, it delays coagulation parameters-prothrombin time (PT) and activated partial thromboplastin time (APTT).[6,8] The action of bromelain on blood coagulation was found to be concentration dependent. At low concentrations, it showed procoagulant effect, while anticoagulant effect was noted at high concentrations.[8] In a study conducted on healthy volunteers and breast cancer patients, there was only a mild prolongation of APTT with no change in PT and plasminogen levels.[9]

The anti-platelet activity of this compound was demonstrated in studied conducted on rats, where dosage up to 30 mg/kg showed significant delay in blood coagulation.[10]

Uterine bleeding and heavy menstruation have also been reported as the side effects of bromelain.[6]

It has been advised to avoid bromelain for two to three weeks prior to surgical procedures, owing to the bleeding risk. The same reason restricts it's use in pregnancy and childbirth, liver and renal diseases.[11] Caution has also been advised for those individuals on anti-platelet and anti-coagulant medications and those with bleeding disorders.[6,7]

The lethal dose (LD50) of bromelain is greater than 10 g/kg in mice.[7]

Thromboelastography (TEG) is a quantitative test, that can assess the ability of whole blood to form a clot after adding a specific coagulation activator (kaolin-cephalin reagent). Cephalin is an important co-factor of the coagulation cascade (for thrombin generation) and Kaolin can initiate the intrinsic coagulation pathway by activating factor XII. The interpretation of TEG is as shown in Table 1.

Table 1: Interpretation of TEG.

TEG components	Description	Normal	Abnormality- cause	Treatment
R (Reaction time)	Time for initiation of fibrin clot formation	5-10 minutes	Prolongation due to decreased clotting factors	-FFP -Anticoagulant reversal (Protamine)
K value	Time to achieve 20 mm of clot	1-5 minutes	Prolongation due to fibrinogen deficiency	-Cryoprecipitate -Lyophilized fibrinogen concentrate
α- angle	Rate at which fibrin cross linking occurs	45- 75°	Reduced due to decreased fibrinogen	-Cryoprecipitate -Lyophilized fibrinogen concentrate
MA (Max amplitude)	Maximum strength of the clot	50-75 mm	Reduced due to decreased platelet count/ function	-Platelet concentrate -DDAVP
LY-30	Degradation of the clot 30 minutes after maximum amplitude	0-10 %	Increased due to increased clot breakdown (fibrinolysis)	-Tranexamic acid -Aminocaproic acid

K value - Coagulation time, α- angle - Alpha angle, LY-30 - Percentage of lysis 30 minutes after MA (Maximum amplitude), FFP - Fresh frozen plasma, DDAVP - Desmopressin (synthetic analogue of 1-deamino-8-D-arginine vasopressin).

CONCLUSION

Thorough history taking is mandatory in any woman with secondary PPH, especially without any identified cause. Immediate measures of management are restoration of the lost blood volume and correction of the deranged coagulation profile. Multidisciplinary team approach is ideal. Here, it was the combined effort of the gynecologist, radiologist and the anaesthetist, that helped in prompt decision making and management of the patient.

TEG/ ROTEM helps in early identification and correction of the coagulation parameters. Uterine artery embolization is a minimally invasive technique that can immediately cut off the vascularity to the uterus. It helped in conservation of the uterus in this case.

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