



CASE REPORT

Right atrial thrombus successfully treated with Heparin

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Abstract

Background: - Thrombi are common complication of long line like umbilical venous catheter or peripherally inserted central catheter (PICC) mainly in extreme and very preterm baby but there is no well-formed protocol for its treatment in pediatrics age group especially in Neonates. There are still very less cases are reported.

Case Presentation: - Male DCDA twin 2 with birth weight of 750 gram had secondary deterioration on day 21 of life with recurrent apnea poor perfusion and increased oxygen requirement. Echo showed a large thrombus in right atrium which was successfully treated with infusion of unfractionated Heparin followed by subcutaneous low molecular weight Heparin.

Conclusion: - Right atrial thrombus is a common complication of central line mainly in preterm baby and Heparin gives good result without any complications if baby is hemodynamically stable and urgent thrombolysis is not required.

Keywords: Thrombus, PICC line, thrombocytopenia, rTPA, LMWH

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List of abbreviations

UVC-umbilical venous catheter
PICC- peripherally inserted central catheter
DCDA- Dichorionic Diamniotic
ICSI- Intracytoplasmic sperm Injection
PROM- Prolonged rupture of membrane
NEC- Necrotizing Enterocolitis
IVH- Intraventricular Hemorrhage
rTPA- Recombinant Tissue Plasminogen Activator
LMWH- Low Molecular weight Heparin

Introduction

Thrombi are common complication of long line like umbilical venous catheter or peripherally inserted central catheter (PICC) mainly in extreme and very preterm baby. Option available for treatment of thrombus is ranges from no treatment to use of heparin and thrombolytic agent like recombinant tissue plasminogen activator. Also, there is well formed protocol guideline for thrombi in adult but for neonates still there is no well-formed guideline for treatment of thrombus due to life threatening bleeding complication of heparin and recombinant tissue plasminogen activator. Apart from this there is only few cases are reported and there is very much discrepancy in treatment in neonates. Here we are reporting our case of right atrial thrombus in 28 weaker 750-gram baby which was successfully treated with heparin without any bleeding complications.

Presentation

A male second DCDA twin with 28 wks gestation with birth weight of 750 gram, Small for gestation born to 28 years old primi mother conceived by ICSI conception. This pregnancy was complicated by PIH and abnormal doppler. There is no history of early infantile deaths, early-onset stroke, or coronary heart disease in any of the family members.

Baby was delivered by emergency LSCS in view of PROM and draining PV. Baby had normal transition and did not require any resuscitation at birth. Baby had mild respiratory distress with SAS score of 2/10 for which supported by HFNC for 7 days of life and chest Xray was suggestive of transient tachypnea of newborn.

Umbilical line was established on day one and total parenteral nutrition was given and after 10 days umbilical line was removed and

PICC line was inserted, and position was confirmed by Xray.

On day 12 baby had recurrent apnea and poor perfusion with thrombocytopenia and hyponatremia and clinical picture was suggest of NEC, managed conservatively with antibiotics, inotropic support and platelet was transfused. Baby was improved clinically over period and feed was restarted.

Till day 12 screening Neurosonogram showed grade one IVH and Echo showed small PFO with normal four chamber and was not suggestive of any intracardiac mass.

For thrombocytopenia three times platelets were transfused, blood culture grown *Candida tropicalis* for which inj fluconazole was given but still platelet count was not improving beyond 40000 per cumm. On day 21 again baby had recurrent desaturation with poor perfusion and baby became pale for which baby was put on respiratory support with HFNC and inotropes (inj Dobutamine) was started for poor perfusion and normal non-invasive blood pressure was normal 53/43mmHg and mean was 46 mmHg. Blood test showed drop in platelet counts to 20000/cumm, hemoglobin 8g/dl with other parameter like sodium, calcium and LFT were within normal range with normal blood gas. Neurosonogram showed non progressive grade one IVH.

Echocardiography showed large right atrial thrombus of size 10 mm × 6 mm arising from intra-atrial septum and obstructing Tricuspid valve (fig.) but flow was present.

Management

Clinically baby had desaturation with poor perfusion, started on HFNC support with 30% fio2 and Dobutamine infusion. Negative CRP and normal chest x-ray with normal lungs finding had ruled out pneumonia and other infection inspite of thrombocytopenia (platelet count 20000/cumm). In view of large right atrial thrombus with symptomatic baby after discussing with cardiologist unfractionated Heparin was started as continuous infusion at the dose of 28 units/kg per hour inspite of low platelet count because. We thought thrombocytopenia may be due to over consumption because it was not improving even after transfusing platelets and giving appropriate antibiotics for fungal infection. We have not given Tissue plasminogen activator as baby was hemodynamically stable and there may be more chance of bleeding due to tissue

plasminogen activator. PT APTT and INR was monitored, anti-factor Xa level could not be done due to logistic reason. PT APTT was slightly on higher range after 48 hrs of Heparin infusion but there was not any bleeding manifestation was noted in the baby. After 48 hours of Heparin infusion, Platelet counts were improved, and size of thrombus was reduced.

After 3 days of unfractionated Heparin infusion, it was switched over to Low Molecular weight Heparin at the rate of 2 mg/kg per dose Subcutaneously 12th hrly. Gradually after 10 days of Enoxaparin, thrombus was dissolved completely, Enoxaparin was given for 3 wks and stopped.



Discussion

Atrial thrombus is a common complication of malposition of long line like UVC or PICC in neonates but can happen in normally positioned long line due to difference in neonatal coagulation system from those of children and adults, with a higher level of factor VIII and von Willebrand factor activity and low levels of factors II, VII, IX, X, XI, and XII (1). Incidence is equal in Term or Preterm and Male or Female baby, but Prematurity and Intravenous catheters are common risk factors or thrombus formation as intravenous catheter act as nidus for Platelet & Fibrin accumulation [2,3,5].

Guideline for the use of thrombolytic agents in adult is well established but still there is no proper guideline in Pediatric patient and especially in Newborn (5). Treatment option of right atrial thrombus is consists of no treatment, Heparinization, thrombolysis with thrombolytic agent like recombinant Tissue Plasminogen Activator followed by low molecular weight heparin infusion or surgical removal. Various reported cases from Murki et al. and Dewals et al. had used rTPA for acute lysis of thrombus in hemodynamically unstable baby or crashing baby without any complication but one case from Alicia sheen et

al had used Heparin infusion for relatively stable baby with atrial thrombus with significant reduction in size of thrombus [6,7]. In our case we had treated the atrial thrombus successfully with Heparin and rTPA was not used as baby was hemodynamically stable and we had found very good result with Heparin without any complication.

Conclusion

Acute or subacute deterioration with Apnea, Desaturation Persistent Thrombocytopenia with normal sepsis marker without lung finding in preterm baby with risk factor like long line like UVC or PICC line, we must keep the chance of thrombus in our mind. rTPA should be used for hemodynamically unstable baby and Heparin gives good result without any complications baby is hemodynamically stable and urgent thrombolysis is not required.

Conflicts of interest

The authors declares that they do not have conflict of interest.

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