We describe a case of a very low birth weight premature female twin with intracardiac thrombosis. Her condition was consistent with neonatal sepsis, and she was treated with advanced life support, antibiotic therapy, parenteral nutrition, blood transfusion, and central venous catheterization. Infective endocarditis was suspected, and a large intracavitary thrombus was detected by two-dimensional Doppler echocardiography. Surgical procedure was not only technically difficult but also highly lethal, being contraindicated in some cases. Consequently, the use of the thrombolytic recombinant tissue-plasminogen activator (rTPA) associated with aspirin was the treatment of choice, and complete dissolution of the thrombus was achieved without adverse effects.

Case Report

A female premature neonate (postnatal gestational age 34.4 weeks), the first twin delivered by cesarean section, with APGAR score 7/8, intact membranes, head circumference 29 cm, and length 40 cm was admitted to the Neonatal Intensive Care Unit (UTI da CRIANÇA) for early respiratory distress. At the beginning of the 75-day hospital stay, she had moderate hyaline membrane disease, early neonatal sepsis associated with meningitis, pneumonia, and jaundice. She was given exogenous surfactant, invasive and non-invasive ventilation (811 hours of oxygen exposure), broad-spectrum antibiotic therapy (covering anaerobic, fungal, Gram-positive and Gram-negative organisms), light therapy, cardiotonics, blood products, intravenous immunoglobulin (three days), and total parenteral nutrition (32 days). The baby girl developed necrotizing enterocolitis (Bell stage II), anemia, right pleural effusion, bronchopulmonary dysplasia; disseminated intravascular coagulation, gastroesophageal reflux, plus sucking and swallowing incoordination. Besides the peripheral vascular access, a peripherally inserted central catheter (PICC) was placed via the brachial vein and maintained for 17 days. Once her condition was clinically and surgically controlled (bowel resection and ileostomy), she showed C-reactive protein levels showing satisfactory results.

Key words

Fibrinolytic agents; plasminogen; aspirin; thrombosis/complications; platelet aggregation inhibitors.
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Combination rTPA and aspirin therapy for intracardiac thrombosis in neonates

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Discussion

Preterm, very low birth weight neonates often develop severe cardiorespiratory and infectious complications, among them septic arthritis, osteomyelitis, and endocarditis. Some patients require central venous catheter, therefore complications secondary to this procedure are likely to occur. Central venous catheter and infective endocarditis are possible causes of thrombi formation.

Based on this patient’s clinical and laboratory parameters, a treatment for infective endocarditis was offered as primary option, and appropriate studies were performed. Among the diagnostic possibilities, such as thrombus, tumor, and vegetation, the hypothesis of thrombosis was the most likely, considering the long-term use of central venous catheter, absence of cardiovascular symptoms, negative blood culture, echocardiographic images showing normal cardiac chambers, and the presence of a single, homogeneous, smooth-surfaced echodense mass in the right atrium, non-adherent to the wall or to the tricuspid valve.

Peripheral catheters are routinely used in neonates to optimize nutrition and provide stable infusion of medication into the central vascular system. Central catheters are associated with thromboembolic events and may be observed in 13% to 74% of pediatric patients. Among risk factors, no relationship was found with the type of catheter insertion (peripheral or central), its diameter or dwell time, but rather with its location (most frequently in the femoral and subclavian veins and less frequently in the brachial and jugular veins). Even though the route used in this patient was that of lowest risk, thrombotic events may occur; however, neither the intracardiac location nor the large volume found is common.

Surgical approach in these cases is not only technically difficult but also associated with high mortality, especially in premature neonates, and may be contraindicated if thrombosis within right heart chambers. In spite of the limited experience with rTPA in neonates, some authors have successfully used this drug in pediatric patients. Although no double-blind, randomized clinical trial evaluating its therapeutic efficacy and side effects has yet been conducted, this agent is known to have low affinity for circulating plasminogen, which allows thrombus resolution without systemic repercussions and, thereby, supports its use. Combination therapy with this thrombolytic and aspirin yielded excellent results, with total thrombus dissolution and no complications, especially hemorrhagic, associated with other thrombolytics. The fact that aspirin is an effective and relatively safe antiplatelet agent, in addition to encouraging results from previous studies, makes it a promising option for treating intracavitary thrombus.

This study was intended to demonstrate that rTPA in combination with aspirin is an effective alternative for intracardiac thrombosis management in premature, very low birth weight neonates (<1500g), in whom surgical approach is technically difficult to perform and is associated with high mortality rates, and may be contraindicated. It also provides another piece of scientific evidence for refining the therapeutic modality in these cases, where no consensus exists in the literature.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.
References


