Deep Vein Thrombosis Associated with Osteomyelitis

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ABSTRACT

Three children developed deep vein thrombosis (DVT) along with osteomyelitis of the femur. Although DVT was recognized early, the diagnosis of associated osteomyelitis was delayed due to overlapping clinical signs and the absence of radiological changes in the initial X-rays.

Key words: *Deep vein thrombosis, Osteomyelitis, Pulmonary embolism.*

INTRODUCTION

Deep Vein Thrombosis (DVT) is relatively rare in children with an estimated incidence of less than 0.01%.(1,2). It is usually secondary to serious underlying conditions including surgery, trauma or the presence of indwelling vascular catheters(3-6).DVT in association with osteomyelitis is extremely rare. In a child with osteomyelitis the presence of co-existing DVT may be easily overlooked as the clinical features of pain, swelling, redness etc. are common in both conditions(4,5).We report three cases of osteomyelitis femur with associated deep vein thrombosis.

CASE REPORTS

We report 3 children aged 8½ years, 6 years and 13 years who presented with acute onset of fever, pain and swelling of lower limb. Two of these had a history of preceding trivial trauma. All 3 were diagnosed to have deep vein thrombosis involving femoral vein (case 1); right external iliac and proximal femoral vein (case 2); and left external iliac, proximal femoral, left popliteal and right external iliac veins (case 3) on doppler ultrasound and were found to have associated osteomyelitis of the ipsilateral limb. Diagnosis of osteomyelitis was delayed due to similarity of clinical profile of both conditions. *S. aureus* and enterococci were isolated in case 3 and 2 respectively; no organism could be isolated in case 1. All 3 required mechanical ventilation, 2 for suspected pulmonary embolism and 1 for acute respiratory distress syndrome (ARDS).Two recovered with residual orthopedic problems and one expired (case 2).

DISCUSSION

Although pain and limb swelling were the presenting features in all three cases, osteomyelitis was detected late in two of them. This is mainly due to the fact that *X*-rays in osteomyelitis may be normal for the first 7 to 14 days. More sensitive imaging modalities such as radionuclide scintigraphy or magnetic resonance imaging (MRI) need to be utilized when the clinical suspicion is strong.

The pain and swelling secondary to osteomyelitis may overshadow the features of DVT such as edema, shiny overlying skin, erythema, dilated veins and calf tenderness. DVT is thus detected only incidentally in many of these cases on angiography or colour doppler ultrasound(2,4,6). In two of our cases the diagnosis of DVT was made early on the basis of doppler ultrasound. In the index case this diverted our attention away from the co-existing osteomyelitis as we attributed all the clinical findings to DVT. In the third case in spite of being fully aware of the possibility of co-existing osteomyelitis we were unable to do the MRI or the scintigraphy during the early phase of the illness as the child was on mechanical ventilation and hence could not be transported easily.

Thrombolytic therapy with continuous intra-venous urokinase infusions may be attempted when DVT is diagnosed early. This may help in prompt resolution of symptoms, prevention of pulmonary embolism, restoration of normal venous circulation,

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preservation of venous valvular function and prevention of postphlebitic syndrome. In cases diagnosed late, anticoagulation with heparin and warfarin remains the mainstay of treatment. Regular heparin can be given intravenously as a bolus of 75U/kg followed by a continuous infusion of 20U/kg/hr. This is titrated to maintain the activated partial thromboplastin time (aPTT) levels at 1.5 times the control. Low molecular weight heparin (LMWH) is a convenient alternative. Its activity is measured in units of factor X inactivation and monitoring of the aPTT is not required. The dose is weight adjusted. LMWH is administered subcutaneously and its half-life permits single or twice daily dosing(7).

Surgical therapy of DVT may be indicated when anticoagulant therapy is ineffective, unsafe or contraindicated. The major surgical procedures for DVT are clot removal and partial interruption of the inferior vena cava by insertion of filters to prevent pulmonary embolism(6). We did not require surgical intervention in any of our cases.

Pulmonary embolism, a rare event, was suspected in two of our patients based on the sudden onset of acute breathlessness and *X*-ray findings of haziness. However as we could not do either a VQ scan or a pulmonary angiography, the diagnosis of pulmonary embolism could not be established(1,8). Previous studies have emphasized the importance of the evidence of phlebitis and other risks factors for venous thromboembolism in diagnosing pulmonary embolism in patients who present with pleuritic chest pain and respiratory distress(9).

Although not considered as a high risk for DVT, thromboembolic complications can occur in the setting of osteomyelitis and affected patients may be at higher risk of disseminated infection(10). Clinicians need to be alert to this possibility and resort to appropriate imaging modalities such as doppler ultrasound to detect the presence of associated DVT in children with osteomyelitis.

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