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Case report

Medical treatment of a central vein suppurative thrombosis with cerebral metastatic abcesses in a burned child

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Abstract

A 2-year-old girl admitted with third degree burns (35% TBSA) received 7 weeks poly-antibiotictherapy combined with heparin for a severe Methicillin-resistant *Staphylococcus aureus* sepsis with multiple metastatic abcesses (lung, skin, brain), from a suppurative thrombophlebitis of the right jugularis interna, extended to the axillary and cava superior veins. Surgical treatment was contraindicated by the local extension. The child was discharged without major neurological sequelae 3 months after admission.

Keywords: Burns; Catheterisation; Heparinisation; Metastatic abcessses; Sepsis; Suppurative thrombophlebitis

1. Introduction

Burn patients are known to develop suppurative thrombophlebitis on catheters [1]. Impairment of immunity, long term intravenous catheterisation and parenteral hyperalimentation, bacteremia associated with frequent wound manipulations and surgery represent different various causative factors to explain this severe complication [2,3]

2. Case report

The day before Christmas a 2-year-old girl was admitted in our burn center for third degree burns (35% TBSA: left arm thorax, neck and chin) complicated by inhalation injury. Artificial ventilation was started on admission and escharotomies were performed on the left arm and on the left part of the thorax. Burn excision was started at day 6 involving the thorax, back, and abdomen.

The child was extubated 10 days after admission.

Safe sites for central catheter insertion were difficult to find in relation to the burned areas and surgical excisions; intravenous perfusion was therefore limited to surgical procedure needs. On day 25 the general condition of the child worsened dramatically: temperature rose to 40.6°C; WBC count fell progressively to 1900 elements/mm^3 on the 28th day.

The jugular catheter inserted 2 days previously was immediately replaced by a femoral line, and vancomycin and aztreonam antibiotic therapy were started on the basis of a previous positive catheter culture for Methicilin-resistant *Staphylococcus aureus* (MRSA) associated with a positive urine culture for *Escherichia coli*. On day 31 she developed typical Osler nodules (cutaneous metastatic abcesses) on the arms, legs and hands. Cerebral CT scan, transoesophagal echocardiography, liver and kidney echography were normal at this time.

Artificial ventilatory support was required from the 33rd day as a result of respiratory and neurological degradation. Repeated blood, nose, throat, expectorations and wound cultures remained positive for MRSA; *Candida albicans* was also found at direct examination of expectorates and antibiotic therapy was extended to include imipenem, fucidin and fluconazole.

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The WBC count rose to 50 000 elements/mm^3, CRP was 47 mg/dl. A CT scan (on day 34) showed a left thalamic lucent area and multiple abcesses of the lungs. Opthalmological examination showed a normal situation.

The condition of the child improved slowly, although she developed a bilateral motor deficit, predominant in the right arm. Blood cultures remained positive for MRSA until the 39th day, all other cultures became negative after the 42nd day. She became completely apyreic 3 weeks after the beginning of her infection (46th day).

On the 44th day, a head and neck NMR confirmed bilateral cerebral abcesses associated with a left anterior thalamus infarct. Thrombosis of the right jugularis interna vein was extended to the axillary and to the superior part of the vena cava, confirmed by Doppler echography and digital angiography. Repeated transoesophagal echocardiography remained normal. Surgical excision of the thrombophlebitis was impossible because of the thrombus extension, and intravenous heparin administration was immediately started for 5 weeks. The child's condition improved gradually, and the neurological deficits (paresis of the four limbs) progressively regressed. Imipenem was stopped after 4 weeks, but vancomycin associated with fucidin was given for 7 weeks. The child was discharged on the 93rd day; brain abcesses were still present on the cerebral scan, contrasting with the dramatic improvement of the neurological status, which was normalised.

3. Discussion

Risks related to peripheral venous cannulation are usually local and benign; the most serious problems (bacteraemia and sepsis) remain rare complications (0.4%). Suppurative thrombophlebitis is a rather uncommon severe complication poorly described [1,4]. Diagnosis is often late and subsequent mortality high. The global incidence varies with patient age and population: 0.14% in adults and between 0.035 and 0.007% in children [4–7].

Burn patients seem to be susceptible to thrombophlebitic problems (4.0–7% in patients with burns over 20% TBSA) [1,8]. Symptoms are often occult: 36% of burn patients show local inflammation: tenderness, erythema along the vein, or swelling of the incriminated limb. Pus expressed from the vein is quite pathognomonic of the pathology. Previous cannulation sites must therefore be carefully (eventually surgically) explored to exclude suppurative thrombophlebitis [1,2,5].

Pathogens encountered under these circumstances reflect mainly those cultured from the burn wounds: *S. aureus* (in certain cases methicillin resistant) is very frequent (18–73%), followed by the Gram-negative organisms (*Pseudomonas aeruginosa*, *providencia* and *klebsiella*) and anaerobes (*Bacteroides*, *Peptosteptococcus*…) or nonbacterial pathogens (*Candida*…) [2,9,10]. Suppurative thrombophlebitis has a poor prognosis if not recognised: 100% of untreated patients die in septic shock often associated with endocarditis, 60% of operated patients die: treatment failure could be attributed to undertreatment, inadequate or an incomplete approach [1,2]. The gold standard for the treatment of suppurative thrombophlebitis remains surgical excision of all the infected vein and tissues; nonsurgical treatment has been considered as poorly effective [1–3,11].

But medical approach with systematic use of heparin-based anticoagulation associated with broad antibiotics proved to be effective for patients unable to support the surgical treatment, due to the localisation of their lesions and to their own condition.

This case report supports the observation that an aggressive medical approach for a prolonged period represents an interesting and efficient alternative to surgical excision of the infected vascular tissues in burn patients with extensive thrombophlebitis when localisation or patient status contraindicates surgery.

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