

Cavernous Sinus Thrombosis With Excellent Response to Antibiotics And Heparin Anticoagulation: A Case Report

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Abstract- Cerebral venous sinus thrombosis is a rare life-threatening condition with an incidence of about 0.67 per 1,00,000 children per year. The mortality rate in CST is very high (20 to 34%) and survivors have increased risk of developing permanent deficit including blindness, nerve palsy, coma etc. Anticoagulant therapy is an important part of treatment along with antibiotics, steroid and surgical therapy. A 15years male child presented with cellulitis of face, bilateral proptosis, fever and headache of 1week duration was diagnosed as septic cavernous sinus thrombosis following Staphylococcus aureus infection involving the danger area of face. He had an excellent response to treatment with intravenous antibiotics with third generation cephalosporin, vancomycin and metronidazole, and unfractionated heparin anticoagulation followed by oral warfarin.

Keywords: Cerebral venous sinus thrombosis; Cavernous sinus thrombosis; Anticoagulant; Heparin.

INTRODUCTION:

Cerebral venous sinus thrombosis is a rare life-threatening condition with an incidence of about 0.67 per 1,00,000 children per year (1). About two-thirds of the cases of septic cavernous thrombosis (CST) are due to bacterial infections with Staphylococcus aureas, pneumococci, streptococci, gram-negative bacteria and anaerobes (2). The mortality rate in CST is very high (20 to 34%) and survivors have increased risk of developing permanent deficit including blindness, nerve palsy, coma etc (3). Anticoagulant therapy is an important part of treatment along with antibiotics, steroid and surgical therapy. Empiric antibiotic therapy in septic CST is mainly with third generation cephalosporin, metronidazole and vancomycin (4). We, hereby, report a case of septic cavernous sinus thrombosis following infection of the danger area of face by Staphylococcus aureus with excellent response to antibiotics and heparin anticoagulation.

CASE REPORT:

A 15 years, male was admitted with cellulitis of face, bilateral proptosis, fever and headache of 1 week duration. There was no history of convulsion, altered sensorium and no significant past illness. On examination, he was hemodynamically stable, positive signs of meningeal irritation, bilateral external ophthalmoplegia, proptosis, chemosed and edematous conjunctivae, bilateral constricted and equal pupils, reacting to light, positive finger counting and normal cornea. Empirical antibiotics treatment with ceftriaxone, vancomycin, gentamicin and metronidazole was started for suspected septic CST as a complication of cellulitis involving the danger area of face, after sending blood culture, CSF culture, pus culture from the cellulitis site and eye swab for culture and other relevant investigations. On day 3 of admission, endotracheal intubation and mechanical ventilation was required for deteriorating sensorium. MRI brain and orbit was suggestive of facial cellulitis including danger area with bilateral cavernous sinus thrombosis/ septic thrombophlebitis with small left sided medial temporal infarct. MR Venography showed no flow in both cavernous sinuses. He was started on unfractionated heparin infusion @ 20 unit/kg/hr and monitored by aPTT. Blood culture, pus culture and eye swab culture all grew Staphylococcus aureus, but CSF study was normal with sterile CSF culture. The child gradually improved and extubated after 9 days of mechanical ventilation. Subsequently the patient was started on oral anticoagulant, warfarin and heparin infusion was gradually tapered off and stopped after 2 weeks. Effect of warfarin was monitored by INR, keeping the value in between 2-3. He was discharged after about 4 weeks of hospital stay on oral warfarin. After 1month repeat MRI brain showed significant resolution of cerebral venous sinus thrombosis; MR Venography (Fig.1) showed predominant drainage on right side with absent flow in the cavernous sinuses. The child was reviewed periodically with INR report every 3-4 weeks and he was doing well on subsequent follow up visits till 6 months without any residual CNS problems.

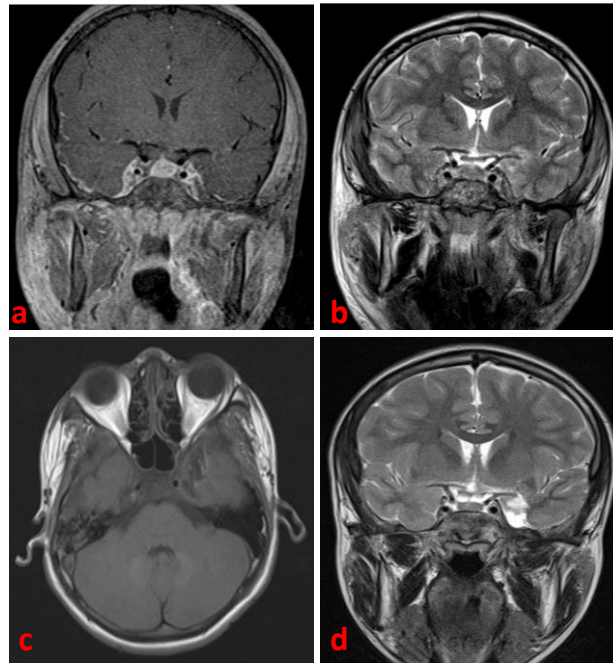


Fig.1 Pre treatment: **a. T2 Coronal:** There is heterogeneous T2 hyperintensity of the cerebral veins on both sides with convex margins; **b. T1 Coronal post contrast:** shows multiple filling defect in cerebral veins with enhancement of surrounding dura. **Post treatment:** **c. T1 Axial :** shows small gliotic changes in the left anterior temporal lobe corresponding to the lesion in ADC map. There is resolution of orbital and right temporal oedema. **d. T2 coronal:** shows resolution of swelling of the cerebral veins on both sides.

DISCUSSION:

CST may occur due to septic or aseptic causes. Septic CST patients are sick and present with fever almost in all cases, unilateral headache, altered sensorium and classical ocular manifestations of chemosis, proptosis and external ophthalmoplegia. Strong risk factors for septic CST include recent history of acute sinusitis, facial or orbital infection.

Patients with aseptic CST like in genetic or acquired prothrombotic conditions, present with a similar but more subtle presentation with no signs and symptoms of sepsis, meningitis, or primary infection. Previous history of arterial or venous thrombosis is important. Anticoagulation therapy in children with cerebral venous sinus thrombosis is controversial. Both unfractionated and low molecular weight heparin have their individual advantages and disadvantages. But early anticoagulant therapy with antibiotics helps in reducing the morbidities like blindness, ophthalmoplegia, stroke, focal seizure etc compared to antibiotic therapy alone (5). Heparin may reduce mortality (14% vs. 36%) in carefully selected septic CST cases (6). Bhatia K et al reported the beneficial role of early adjunctive anticoagulation therapy after radiological exclusion of haemorrhagic sequelae in septic CST (7). Stolz E et al also reported favourable outcome in all 26 patients with acute cerebral venous sinus thrombosis in a prospective study treated with intravenous heparin, followed by oral anticoagulation for 12 months (8). G. Sébire et al reported 42 children from 3 weeks to 13 years with both septic and aseptic cerebral venous sinus thrombosis (4 cases with CST), out of whom 18 patients were anticoagulated immediately with heparin (unfractionated in 15 and low molecular weight in 3) and then warfarin or low molecular weight heparin for up to 6 months with good outcome in the anticoagulated patients (9). M Absoud et al also reported a 6 years old boy with bilateral CST following *Streptococcus milleri* sinusitis, with good response to treatment with intravenous antibiotics, surgical drainage and anticoagulation with low molecular weight heparin followed by oral warfarin for 3 months (10).

CONCLUSION:

Though CST is a rare and life-threatening complication in children, timely appropriate antibiotics and early anticoagulation therapy is highly beneficial for good outcome. Unfractionated heparin can be successfully used as an anticoagulant for the treatment of septic CST.

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