

Skull-base Osteomyelitis: a Dreaded Complication after Trivial Fall and Inadequate Management

Kundan Mittal¹, Anupama Mittal², Suman Yadav³, *Jaivinder Yadav¹

¹ Department of Pediatrics, Pt. B.D Sharma, PGIMS, Rohtak, Haryana, India.

² Department of Anatomy, Pt BD Sharma PGIMS, Rohtak, Haryana, India.

³ Department of Anatomy, University College of Medical Sciences, New Delhi, India.

Abstract

Introduction

Skull-based osteomyelitis (SBO) is bony infection which generally originates from inadequately treated chronic infection, adjoining tissue infection or after trauma.

Case Report

11 months female child had a trivial fall while standing near a bucket. The child developed fracture of right clavicle and left orbital swelling which was inadequately treated. This resulted in spread of infection to adjoining tissues, skull bones, sinuses and brain.

Conclusion

Cranial base osteomyelitis is rare but dreaded condition which requires early diagnosis and prompt treatment to avoid mortality and morbidity in form of neurological deficits and permanent disability.

Key Words: Infection, Osteomyelitis, Skull base.

***Corresponding Author:**

Jaivinder Yadav, MD, Department of Pediatrics, Pt. B.D Sharma, PGIMS, Rohtak, Haryana, India.

Email: jai1984yadav@gmail.com

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Introduction

Skull-based osteomyelitis is bony infection which generally originates from inadequately treated chronic infection of surrounding tissues. It is a life-threatening condition commonly seen in diabetic or immunocompromised adult patients, but in children it is usually occurs after head trauma. It may also arise as complication of otitis externa when repeated episodes fail to resolve with topical medications and aural toilet, chronic suppurative otitis media or adjoining sinus infection or after head trauma (1-3). The treatment of skull base osteomyelitis should be early and vigorous as spread of infection to nearby structures like brain can be life threatening. We here report a case of skull base osteomyelitis in a 11 months old child after trivial trauma.

Case report

11- month-old female child had a trivial fall while standing near a bucket. The child developed swelling over right supraclavicular region and diagnosed with clavicular fracture which was managed conservatively. Two days later the child developed swelling over left eye, parents consulted local practitioner and the child was given antibiotics drops and sent home. 7-8 days later the swelling over eye increased and there was pus drainage from eye and child was referred to us for further management. The child was admitted in ophthalmology ward and started on intravenous antibiotics and pus was drained manually. Initial lab investigations showed anemia with haemoglobin of 6 g/dl, total leucocyte count was raised to 2,5000 per cubic millimeter with 85% neutrophils. Other investigations kidney, liver function tests, urine examination, serum electrolytes were within normal limits. The pus was sent for culture and sensitivity and coagulase negative staphylococcus aureus was grown in

culture which was sensitive to linezolid and amoxiclav. CT orbit and brain was done to know intracranial extension. It revealed a collection of 1.2X2.4X1 cm along left lower lid in subcutaneous plane, there was no extension to periorbital region or involvement of eye globe. No intracranial extension was found but there was evidence of mucosal hypertrophy of maxillary sinus. The child developed left facial palsy next day. Antibiotics were changed, the child was shifted to the Pediatric intensive care unit (PICU) and Cerebrospinal fluid (CSF) examination was done to rule out meningitis. CSF examination revealed meningitis with raised protein 66 mg/dl and 1-2 pus cells per high power field. The child developed one episode of generalized seizure on day 17 of illness. MRI brain was done to identify intracranial complications. MRI revealed bilateral petrous bone osteomyelitis, sinus hypertrophy of ethmoid, sphenoid sinus, small epidural collection and brain infarct in bilateral frontal and parietal areas. The epidural collection was drained and child was continued on intravenous antibiotics. The child improved over next few days but facial palsy was persisting. Neurosurgical consult was taken and advised for conservative management. The antibiotics were continued for six weeks and the child recovered but facial palsy was persistent at discharge.

Discussion

Osteomyelitis of skull bones is unusual particularly in children. It can affect the calvarium or the base of the skull (1). Mandible, frontal bone, maxilla, nasal bone, temporal bone, and skull base bones are the major bones which are involved in osteomyelitis of the skull. Host factors like systemic diseases that reduce host immunity like malnutrition, diabetes, anemia, radiation, malignancy, and poor hygiene are major risk factors for osteomyelitis as with any other invasive

infectious disease (4, 5). But in children most cases of skull osteomyelitis are related to trauma (6). In our case, the child was anaemic, malnourished, had trivial trauma and treatment was delayed.

Acute osteomyelitis may present with nonspecific inflammatory signs like fever, malaise, pain, and facial cellulites as in our case but high index of suspicion is required. On examination local swelling, redness and spontaneous pus drainage may be present as happened in our case (7, 8). There may not be any associated noticeable radiographic changes initially.

Different imaging modalities may be used in managing children with skull based osteomyelitis, although MRI is probably the best choice due to superior soft-tissue discrimination around the skull base and better depiction of bone marrow abnormalities. CT may sometimes be normal, especially if performed early as happened in our case. Nuclear imaging techniques like Single-photon-emission computed tomography (SPECT) with technetium-99m and gallium-67 SPECT may be useful when CT/MRI findings are inconclusive or for monitoring the course of the disease (9, 10).

In our case MRI helped in clinching the diagnosis and true assessment of extent of spread of infection. Blood investigations like total leukocyte count, Elevated erythrocyte sedimentation rate (ESR) and elevated C-reactive protein (CRP) may also be used as markers in both the diagnosis and monitoring of treatment for osteomyelitis (5). Monitoring of the ESR or CRP is one of the key investigations that can help to guide how long antibiotic therapy to be continued, and its normalization is good indicator for the resolution of infection (7). We also monitored the total leucocyte count, CRP and ESR for the disease progression and recovery in our patient.

Broad spectrum antibiotics, debridement of any necrotic tissue and drainage of pus collection are mainstay of treatment. The skull base osteomyelitis is highly lethal infection in lack of early treatment, proper antibiotic selection and timely surgical interventions as learned from cases in pre antibiotic era (8).

Brain abscess is the commonest complication of skull osteomyelitis which occurs mostly with subperiosteal abscess. The source of the infection should be taken care. Surgical debridement of soft tissue and bone helps in early recovery. Delay in surgical intervention has been associated with prolonged hospitalization (4, 5). Due to the implementation of effective antibiotics and early surgical intervention, our patient was discharged from hospital with minimal residual neurological problems.

Conclusion

Cranial base osteomyelitis is rare but dreaded condition which requires early diagnosis and prompt treatment to avoid mortality and morbidity in form of neurological deficits and permanent disability. A combination of effective surgical debridement with prolonged appropriate antibiotic therapy in early term of skull base osteomyelitis might provide a complete resolution in all cases. Plain X-ray of the skull is helpful in establishing a diagnosis of osteomyelitis, but cranial CT is even more useful for determining the extent of the abscess.

Conflict of Interest: None.

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