

Left Fronto - Ethmoidal Sinusitis Complicated By A Contralateral Subdural Abscess - A Case Report

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ABSTRACT

Subdural abscess although very rare is one of the most frequently encountered intracranial complication of sinusitis. A case of contralateral subdural abscess is most unusual. This paper reports the management of a 14 year old male that presented with a left frontoethmoidal sinusitis complicated by a right subdural abscess. The patient recovered fully after a left fronto-ethmoidectomy and right Burr hole drainage of subdural abscess at same anaesthetic session by the ENT and Neurosurgery team respectively. Timely intervention and the benefit of multidisciplinary approach are highlighted and the use of enhanced Computerized Tomography is sine qua non to optimal treatment:

Key Words: Sinusitis, contralateral subdural empyema, fronto-ethmoidectomy, Burr hole.

There are four pairs of paranasal sinuses namely; the frontal, ethmoidal, sphenoidal and maxillary sinuses. They have an intimate relationship with both the orbit and the intracranium which varies throughout the course of childhood. Of all of them, the ethmoidal sinus is the most well formed in infancy and expands rapidly in early childhood. It is central to the development of infection in the other sinuses because of the site of the osteo-meatal complex. Inflammation of the sinuses, sinusitis could be acute, sub-acute, chronic or recurrent. Intracranial extension of sinusitis has a very high morbidity and mortality rate despite the availability of various antibiotics.

The most common intracranial complications of sinusitis were meningitis (58.8%), epidural abscess alone (15.4%), subdural abscess (12.8%), intracerebral abscess (10.3%) Pott's puffy tumour alone (2.6%) epidural abscess with Pott's puffy tumour (2.6%), superior sagittal sinus thrombosis (2.6%). Carvenoussinus thrombosis was most recorded in this series (Ramzy et al 2008).

It is usual to have an ipsilateral intracranial extension in sinusitis, and sometimes, the intracranial component could expand or become bilateral, but a de novo contralateral intracranial abscess ab initio complicating sinusitis has not been reported in our environment.

We hereby report this unusual occurrence of a left fronto-ethmoidal sinusitis complicated by a right fronto-temporo-parietal subdural empyema from our centre-the only public tertiary referral centre for neurosurgical diseases in South East Nigeria. Ken et al noted that a combined Otolaryngological and Neurosurgical approach is essential for patients with intracranial complications (Ken et al 1997). A precise

diagnosis of an intracranial abscess in our index patient was easily made with enhanced Computerized tomography(CT). CT is more readily available, and cheaper than the Magnetic Resonance Imaging (MRI).

CASE REPORT

A 14 year old male was referred to us by the Paediatricians on account of one month history of nasal congestion and purulent rhinorrhoea, three weeks of headache and left eye swelling and two weeks history of neck rigidity.

The previously healthy child had suddenly developed nasal congestion and rhinorrhoea that were initially trivialized by the parents. However the symptoms worsened and by the following week he came down with left sided frontal headache associated with low grade fever and progressive swelling of the ipsilateral eye necessitating hospital visit where some medications were prescribed.

Two weeks into the illness and while on his drugs his condition continued to deteriorate as he developed neck rigidity, became restless and later lapsed into unconsciousness. He was then moved into another peripheral hospital from where he was referred to the Paediatric department of our hospital.

The Paediatricians invited the ENT team to review and possibly take over management as there was no significant improvement with medical treatment. The ENT team after evaluation invited the Neurosurgeons because of the suspected intracranial extension and a request for CT was made.

Apart from measles which he suffered at 2years there was no significant past medical history. His pregnancy, birth, development, nutritional and immunization as well as family and social histories were not contributory as was the review of system.

Examination revealed a slightly febrile male child, not pale, anicteric and semi-conscious. There was proptosis of the left eye with supraorbital fluctuant mass that yielded serosanguinous aspirate. There were also left hemiparesis, left ophthalmoplegia and subtle right ophthalmoplegia. Anterior rhinoscopy revealed left purulent rhinorrhoea and engorged turbinates but no polyps and tenderness was elicited upon percussion of the left fronto-ethmoidal area with the right essentially normal.

X-ray of the sinuses showed opacified left paranasal sinuses with fluid level in the left frontal sinuses and evidence of cranial erosion. CT scan showed left fronto-ethmoiditis with subtle right ethmoiditis with right fronto-temporo-parietal subdural empyema.

Patient was negative to Human Immunodeficiency Virus screening, the full blood count demonstrated increased white blood count with neutrophilia while the urinalysis was normal. The aspirate yielded no growth on culture. He was continued on intravenous ceftriaxone while metronidazole, chloramphenicol and tenoxicam were added as he was being worked up for surgery.

He had left frontoethmoidectomy and orbital decompression by the ENT team and right frontal and temporal Burr hole drainage by the Neurosurgery team. Intra-operative findings were: - Diseased left anterior and posterior ethmoidal air cells with frank pus; right sided frank subdural abscess under marked pressure approximately 140ml in volume; the left ethmoidal and frontal sinuses were freely communicating with the Right frontal sinus, and the posterior wall of the right frontal sinus was deficient while the left was intact.

Immediate post-operative condition was satisfactory and thereafter patient had full recovery save for occasional focal or generalized seizures. He was discharged home on the 27th day post-op but unfortunately lost to follow up. Efforts to trace their home were unsuccessful and the CT scan films could not be recovered.

DISCUSSION

Sinusitis is an extremely common infection that affects virtually everyone to a degree at sometime in their life. Usually bacterial sinusitis follows viral upper respiratory tract infection. However, the barriers that prevent infection spreading intracranially or to the orbits are extremely effective in most cases, but once breached, the consequences may be very dangerous (Andrew 1998). In our index patient, both barriers were

breached resulting in both orbital and intracranial complications.

The most important mode of transmission of microorganisms from the paranasal sinus to the intracranial cavity is via interconnecting venous channels. Within the diploe of the frontal bone are the valveless veins of Breschet and the resulting osteomyelitis may lead to intracranial abscesses.

Direct spread of infection may be facilitated by bony defects in the sinuses secondary to congenital dehiscence, the embryological remnant of the craniopharyngeal canal and foremen caecum, facial fractures and/or focal osteitis, which usually affect the posterior wall of the frontal sinus due to phlebitis of small penetrating veins. The dura over the posterior wall of the frontal sinus can be separated from the bone relatively easily and thus facilitates the formation of an extradural abscess—a breach of the dura then leads to subdural empyema.

Intracranial abscesses of sinogenic origin account for 27%, 23% and 16% of all intracranial abscesses in Scotland, Cambridge and Liverpool respectively (Bradley et al 1984, Nunez 1991, Brain et al 2004). Intracranial complications including subdural abscess occur most commonly in adolescents and young adults, mainly affecting males. Our patient belongs to this age and sex. It has been suggested that because the diploic system is at peak vascularity in adolescence this age group is more predisposed to this complication but there is no clear explanation for the male preponderance which have been reported in most literature. (Nicholas et al 2001, Conlon et al 1996). Before the advent of computerized tomography (CT) scanning, morbidity was frequently reported in the region of 40% but mortality is currently reported in various series as ranging from 7-25% (Halvin et al 1994). Although this represents a great improvement, significant numbers of patients succumb or suffer long term morbidity as a result of delay in diagnosis and quick treatment.

The radiological findings must be interpreted in the light of clinical findings and if a clinical suspicion of intracranial extension exists even with only subtle radiological changes, immediate neurosurgical evaluation should be sought. The CT scan of our patient clearly demonstrated the lesion but unexpectedly the subdural empyema was on the contralateral side compared with the frontoethmoiditis. What could be the explanation for this unusual finding? Could there have been a congenital bony defect or neglected fracture preceding the presenting disease? The valveless veins could drain in any direction and the possibility of congenital valvular malformation cannot be ruled out. This case also emphasizes the

need for CT scan since an exploratory burr hole may have missed the pathology.

The predisposing factors for intracranial complication include frontal osteomyelitis, a mucocele, or mucopyocele and orbital infection but may arise de novo. Immunodeficiency should be considered but surprisingly, Acquired Immunodeficiency Disease Syndrome has not been associated with a higher incidence of intracranial abscess (Mortimore et al 1998). Our index patient was HIV negative.

The common microorganisms encountered in acute and complicated sinusitis and Streptococcal organisms (milleri and pneumococci), Hemophilus influenza and Staphylococcus aureus. Aggressive antibiotic therapy is vital in the management of these patients. The possible changes of local antibiotic sensitivity patterns must be borne in mind however and an increase in B-lactamase producing H. influenza or the appearance of penicillin-resistant pneumococci would make ceftriaxone the more logical choice (Germiller et al 2006). The no growth from our index patient could be attributed to antibiotic use before sample collection growth from our index patient could be attributed to antibiotic use before sample collection.

CONCLUSION

Intracranial suppuration is a well recognized, albeit rare, complication of paranasal sinusitis and is still seen despite the wide spread use of antibiotics. Due to the intimate relationship of the sinuses to the orbit and brain, rapid spread of infection to these organisms still poses a threat to sight and life.

High index of suspicion, use of CT scan, dedicated multidisciplinary approach and aggressive antibiotic administration are critical to management of such a case. Intracranial complications of sinusitis are challenging, but prognosis can be favourable in children and adults by using aggressive medical and surgical management. (Germiller et al 2006) Early referral of patients to specialist units is highly solicited for.

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