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CASE REPORT

GAS-PRODUCING BRAIN ABSCESS
Arshad A. Siddiqui and Khalid N. Chishli

ABSTRACT
A case of a known psychiatric patient who presented with rapid neurological deterioration is reported. Neuroimaging revealed a gas-producing brain abscess in left parietal lobe with a contiguous focus of infection in the adjacent bone and scalp initiated by obsessive scalp scratching. On complete surgical excision of abscess, followed by culture-based antibiotic therapy, a good neurological recovery was achieved with minimal residual deficits at follow-up.


INTRODUCTION
Gas-producing brain abscess are extremely rare.1-4 Clostridium is the most frequent organism.2 In most cases, a dural defect extending to a contiguous focus of infection is the main cause,2 generally produced by trauma, surgery or tumoral erosion, with the lungs being a primary focus for the latter.1,2

We report a case of brain abscess containing gas forming bacteria, which is contiguous from a trivial recurrent scalp wound, produced by obsessive scratching habit of patient due to nature of her psychiatric illness. Radiological imaging, microbiology and peculiar surgical implications are described.

CASE REPORT
A 35-year-old female presented with focal seizures on right side of body followed by right-sided hemiparesis for 5 days. She developed speech inability, visual disturbance, recurrent vomiting and double incontinence for 2 days prior to admission. The patient was mentally retarded. On physical examination, Glasgow Coma Scale was found 10/15 with expressive dysphasia. Pupils were equal (3mm) and reacting. Fundoscopy revealed bilateral florid papilloedema. She had a right-sided hemiparesis (power 2/5 BMRC scale) and ipsilateral 7th nerve upper motor neuron palsy. Her total leukocyte count was 15000/mm^3 with predominant neutrophilia (90%) and erythrocyte sedimentation rate (ESR) 75 mm.

Plain X-ray films of skull showed a pocket of air with fluid level inside the cranial cavity (Figure 1). CT scan of brain revealed ring-enhancing lesion in the left parietal lobe with hypodensity inside the lesion suggestive of a brain abscess containing gas inside. MR imaging of brain showed a mass lesion in the left parietal lobe with remarkable perifocal edema. Post gadolinium scan showed significant ring enhancement of the lesion with central non-enhancing hypointensity. There was contrast-enhancing track from the abscess extending to the overlying scalp wound (Figure 2), which was consistent with the diagnosis of left parietal lobe gas-producing brain abscess. On interrogation, it proved to be the site of habitual obsessive scalp scratching.

The patient was immediately started on intravenous broad antibiotics empirically (vancomycin, metronidazole and ceftriaxone). She underwent emergency left parietal trephine craniotomy (2 x 2 cm) placed over the infective scalp wound. There was defect (or sinus) noted at this site under the flap. The trephine was placed centering over the skull defect. Dura was adherent to overlying bone and to the underlying capsule of the brain abscess. After opening the capsule, 20-30 cc of pus with extreme fetid smell, gushed out with air bubbles from the abscess cavity. After surgery, the trephined bone flap was not placed back because of suspicion of osteomyelitis.

Figure 1: Plain X-ray skull showing an air bubble with fluid level, inside the cranial cavity.

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Gas-producing brain abscess

Gas-forming brain abscess is generally reported to be polymicrobial containing both aerobic and anaerobic flora.\(^4,6\) Clostridium is the commonest organism reported in literature culprit of producing gas within the brain abscess.\(^2,4\) However, Escherichia coli and Proteus, gram-positive cocci such as Staphylococcus aureus, Streptococcus hemolyticus, Streptococcus faecalis and Peptostreptococcus also contribute frequently to the intracerebral supplicative process.\(^3,9\) Culture growth in our case was also polymicrobial and Streptococcus hemolyticus group and Peptostreptococcus were probably responsible for production of fetid pus.\(^3,9\) The clinical implication of this poly-microbial involvement dictates to treat these abscesses with empirical broad-spectrum antibiotics especially covering the gram-negative flora from the beginning of management.

Despite the virulent nature of gas-forming brain abscesses, the recovery is comparable to a non gas-forming abscess.\(^4,8,9\) This can be achieved by prompt diagnosis, early start of broad-spectrum antibiotics, surgical debridement and excision of both the abscess and the contiguous focus of infection as shown in this case.

**REFERENCES**