Massive subarachnoid pneumocephalus after a stereotactic brain biopsy

Sir,

Image-guided stereotactic brain biopsy (SBB) is a common and generally safe procedure with a morbidity of 3-5% and a mortality of 0-7%.[1] The most frequent complications include hemorrhage and infection. Pneumocephalus is a common consequence of craniotomies in neurosurgical practice[2] but not following SBB. We could not find a case of tension pneumocephalus (TP) following SBB in the review of English literature.

A 28-year-old male with HIV infection, presented with gradually progressing right lower limb weakness of 1 week duration. Physical examination demonstrated right dismetria and right mild crural weakness with diminished reflexes. Magnetic resonance imaging (MRI) of brain showed lesions in the left thalamus-capsular area and in the splenium of the corpus callosum, with high signal intensity on T2-weighted images and no contrast enhancement or mass effect [Figure 1]. Blood and cerebrospinal fluid (CSF) testing for toxoplasmosis, CMV, and EBV serology were negative. A SBB of the thalamus-capsular lesion was performed. No complications during the postoperative period were observed, and the patient was discharged 24 h after the surgical procedure. The histological diagnosis of the biopsy samples was primary B-cell central nervous system lymphoma. He was started on intrathecal methotrexate treatment. Two weeks after discharge the patient was readmitted with altered consciousness, severe headache, expressive aphasia, and increase in right crural weakness. Physical examination revealed a dehiscent incision scar with necrotic tissue and a scalp defect above the burr hole. Brain computerized tomography (CT) scan and MRI showed massive ventricular and subarachnoid pneumocephalus, both “Mount Fuji” and the “Air Bubbles” signs were present. There were no changes in the previous lesions [Figure 2]. CSF examination was normal. The wound was debrided and closed under local anesthesia. The wound healed completely. The patient’s symptoms gradually resolved and was discharged 2 weeks after the admission. Repeat CT scan and MRI showed an expanded brain and complete reabsorption of the pneumocephalus.

Figure 1: Preoperative findings and Postoperative CT scan. T1 and T2 axial-weighted images (a and b) show the two lesions with no mass effect or contrast enhancement, (c) a sagital view, the corpus callosum lesion can be seen. (d) The postoperative CT scan with an air bubble in the biopsy site and bellow the burr hole.

Figure 2: Subarachnoid pneumocephalus and pneumoventricle. (a-c) A large volume of air scattered throughout the subaachnoid space, ventricles and cisterns, Mount Fuji, and air bubble signs can be seen. (d) A communication between the brain and the skin at the site of the incision which allowed air into the skull.
Symptomatic late-onset pneumocephalus is extremely unusual following stereotactic biopsy. No such complication was documented in more than 7000 procedures including our own.[1,3] Late pneumocephalus related to surgery is an unusual finding and is often associated with the presence of a skull or dura defect and a negative intracranial pressure gradient, most of the times as a consequence of a CSF leak, shunts, or lumbar puncture.[4] In this patient, there was a communication between atmosphere and cranial cavity because of wound dehiscence and negative pressure gradient resulted because of repeated lumbar punctures for giving intrathecal chemotherapy treatment. Treatment of this condition should be directed at closing the communication with the atmosphere that provides the valve mechanism.[5]

**References**