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A Post-Traumatic Epidural Tension Pneumocephalus: A Case Report.

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ABSTRACT

Pneumocephalus is usually a self-limiting condition commonly associated with neurosurgical interventions, head and facial trauma. In contrast, tension pneumocephalus is extremely rare, and considered a neurosurgical emergency. Pneumocephalus is commonly seen after head and facial trauma, ear infections, tumours of the skull base or neurosurgical interventions.

Keywords: Tension pneumocephalus; Post trauma

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Case Presentation

A 30-year-old man who deteriorated rapidly after a blunt head trauma. It is a case of post-traumatic epidural tension pneumocephalus. Emergency burr hole evacuation was performed. Epidural tension pneumocephalus is a rare and potentially life-threatening condition, but treatable with the right management. In tension pneumocephalus the continuous accumulation of intracranial air is thought to be caused by a “ball valve” mechanism [1,2]. Tension pneumocephalus is considered a life-threatening, neurosurgical emergency.

He had bruises on his face and thorax, as well as a periorbital swelling. There were no signs of cerebrospinal fluid (CSF) rhinorrhoea. He was otherwise clinically stable with normal vital parameters. The initial examination performed by a trauma team included X-ray imaging of his thorax and pelvis, that were found normal, as well as ultrasound of his abdomen, which showed no sign of free fluid. Imaging with computed tomography (CT) of his head revealed a 11cm×4.5cm expansive epidural lesion in the right temporoparietal region causing significant anteromedial compression of the right lateral ventricle and a midline shift of 7mm shown in figure and no signs of intracranial bleeding or herniation. He was immediately intubated. On examination there were no neurological deficits. A postoperative control CT the first postoperative day showed a small epidural bleed in the compartment that previously was filled with air, but the majority of the epidural air was removed and the midline was normalized.

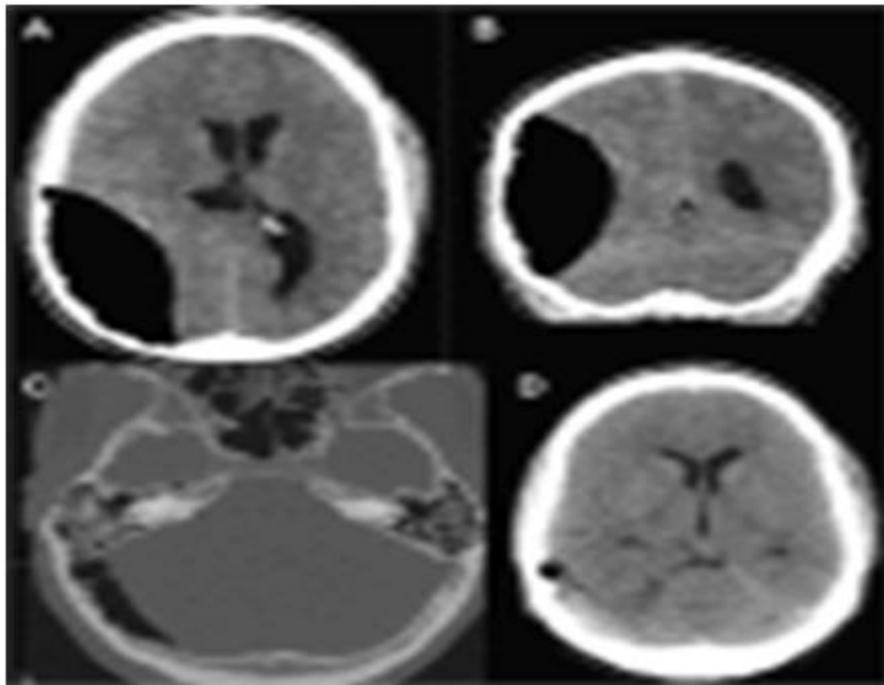


Figure 1: Showing imaging with computed tomography of the head

He recovered quickly from this procedure, and postoperative CT scans were satisfactory, with re-expansion of the dura, resolution of the midline shift, and only minor residuals of the epidural air. He was discharged from the hospital 17 days after admission.

DISCUSSION

The causes indicated that trauma was the most common cause of pneumocephalus, associated with nearly 75 % of the cases, whereas neoplasm and infection were found in 13 % and 9 % of the cases, respectively [3]. Depending on the underlying cause, the intracranial air can be distributed in the epidural space, subdural space or subarachnoid space, intraventricular or intracerebral, or a combination of these. A typical finding after burr holes or craniotomies is frontal air entrapment with a bilateral distribution.

The treatment depends on the underlying cause of air entrapment, but in most cases it resolves spontaneously with conservative care. Tension pneumocephalus producing significant symptoms is considered a neurosurgical emergency, and must be evacuated similar to an intracranial hematoma. Treatment options include puncture with a needle if there is an existing burr hole, or placement of a new burr hole. Otogenic pneumocephalus is also usually managed surgically, at least in the few cases reported in the literature, in an attempt to equalize pressure and close the fistula causing intracranial air entrapment [4]. As he experienced rapid clinical deterioration and life-threatening symptoms of herniation, immediate pressure relief was indicated, and obtained with a burr hole evacuation of the entrapped air. Although the patient experienced a short relief of symptoms caused by tension, a more invasive procedure was needed to resolve the condition [5,6].

CONCLUSION

Epidural tension pneumocephalus is a rare and potentially life-threatening condition, but treatable with the right management. Treatment depends on cause, and in many instances no treatment is necessary with the air being gradually resorbed. This is the case in the vast majority of post-operative pneumocephalus, an expected finding in essentially all post-craniotomy patients. In cases of tension pneumocephalus then a burr hole may need to be performed to relieve pressure. When pneumocephalus results from a CSF leak then identification of the leak site and surgical repair is usually required.

REFERENCES

- [1] Di Lorenzo N, Caruso R, Floris R, Guerrisi V, Bozzao L, Fortuna A. *Acta Neurochir* 1986; 83(3–4):112-5.
- [2] Markham JW. *Acta Neurochir* 1967; 16(1):1-78.
- [3] Osborn AG, Daines JH, Wing SD, *J Neurosurg.* 1978; 48(3):355-9.
- [4] Goldman LW. *J Nucl Med Technol* 2007; 35(3):115-28.
- [5] Heckmann JG, Ganslandt O. *N Engl J Med* 2004; 350(18):1881.
- [6] Gore PA, Maan H, Chang S, Pitt AM, Spetzler RF, Nakaji P. *J Neurosurg* 2008;108(5):926-9.