and travel, entering into the ventricles, and becoming attached to the ventricular wall. This hypothesis could be indirectly supported by this case. Since the first report in which Maravilla presented findings on intraventricular fat-fluid level secondary to the spontaneous rupture of a dermoid cyst, a number of reports have noted the spread of fat globules into CSF pathways in patients with fat-containing tumors such as epidermoid or a dermoid tumors. To the best of our knowledge, there has been no prior report regarding ectopic recurrent tumor tissue within the ventricle, which has been histologically proven to be an epidermoid cyst. Epidermoid cysts in the CSF pathways secondary to spontaneous rupture may be widespread. In cases of multiple intracranial epithelial cysts, dissemination of the epithelial clusters into the CSF could reasonably be explained by asymptomatic rupture or spontaneous breakdown of the cyst wall.

In summary, we report an unusual case of ectopic ventricular recurrence of an epidermoid cyst in the middle fossa with confirming histological characteristics. Care should be taken to prevent the spread of cystic content into the CSF pathways during epidermoid removal.

References

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Tension pneumothorax complicating apnea testing during brain death evaluation
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Abstract
Tension pneumothorax is a rare complication of the apnea test using the apneic oxygenation method. In reported cases, it has been attributed to massive air trapping beyond a supplemental oxygen cannula that was obstructing the airway. We report a case of tension pneumothorax, pneumomediastinum, and pneumoperitoneum that developed during the apnea test as a result of direct airway perforation by the supplemental oxygen cannula. We review the literature concerning catastrophic airway complications associated with the apneic oxygenation method and suggest ways to avoid them.

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Keywords: Apnea test; Brain death; Pneumothorax

Apnea testing is an essential element of the evaluation for death by neurological criteria. The apneic-oxygenation method, during which supplemental oxygen is provided by a cannula placed in the endotracheal tube (ETT), is the recommended method for performing this test. 1 A high incidence of complications has been described in association with this method, primarily hypotension and hypoxemia. 2–4 Infrequently, more serious complications including cardiac arrest, cardiac arrhythmia, and pneumothorax have been reported. 5–7 We describe the incidence of
tension pneumothorax, pneumomediastinum, and pneumoperitoneum leading to pulseless electrical activity that occurred during performance of apnea testing using the apneic-oxygenation method. We review the literature regarding such airway catastrophes and suggest methods to avoid them.

1. Case report

A 55-year-old woman with a past medical history notable for type 2 diabetes, pancreatitis, chronic renal insufficiency, myocardial infarction, and a cryptogenic left occipital ischemic stroke, was admitted for abdominal pain. She was found to have a small bowel infarction and underwent resection of the infarcted segment on hospital day 1. Her postoperative course was complicated by failure to wean from the ventilator. On post-operative day 4 she was noted to have decreased arousal and new left hemiparesis. A CT scan of the brain revealed a large right middle cerebral artery infarct with substantial edema and mass effect. Over the next 2 days, her alertness progressively declined and spontaneous breathing stopped. On post-operative day 6, the neurology service was asked to determine if the patient was dead by neurological criteria.

At the time of brain death evaluation, she was normothermic and unresponsive to loud verbal and noxious tactile stimuli. The pupils were 5 mm diameter, round, and did not react to light. The oculocephalic reflex was absent and sequential irrigation of each external auditory canal with 60 cc of ice water did not cause deviation of the eyes. The corneal reflex was absent bilaterally, there was no grimace or limb movement to noxious styloid pressure, and there was no cough or gag to endobronchial suctioning or manipulation of the ETT.

Apnea testing using the apneic oxygenation method was attempted. Pre-apnea test arterial blood gas analysis showed a pH of 7.43, a carbon dioxide tension (PCO₂) of 43 mmHg, and an oxygen tension (PO₂) of 144 mmHg. Pre-oxygenation with FiO₂ (fraction of inspired oxygen) of 100% was performed for approximately 5 min before the ETT was disconnected from the ventilator. Next, a nasal cannula from which the nasal prongs had been removed was inserted into the number 7 ETT. Oxygen was delivered at a rate of 10 L/min. Rapidly expanding subcutaneous emphysema in the neck and chest wall occurred immediately after insertion of the cannula. Within seconds, the patient developed pulseless electrical activity.

The ETT was immediately reconnected to the ventilator, which measured very high inspiratory pressures. Manual ventilation was initiated. An emergency chest film revealed a large left pneumothorax, pneumomediastinum, pneumoperitoneum, and extensive subcutaneous emphysema (Fig. 1). The distal end of the ETT was within 1 cm of the carina. Autopsy results confirmed the presence of pneumomediastinum, and pneumoperitoneum. No overt breach was found in the wall of the trachea or proximal mainstem bronchi.

2. Discussion

Apnea testing is technically challenging and has been associated with a high rate of complications. In the few studies that have examined this topic, complication rates as high as 68% have been found. Hypotension attributed to hypoxemia is one of the most common of these complications. Accordingly, methods to minimize hypoxemia have been devised. One such method, described in the American Academy of Neurology “Practice Parameters” on determining brain death in adults and known as apneic oxygenation, involves the provision of high-flow oxygen into the endotracheal tube by means of a cannula placed at the level of the carina.

We believe that the insertion of an oxygen cannula into a deeply positioned ETT led to the complications described in our patient. She had no history of chronic obstructive pulmonary disease, elevated peak airway pressures, bullae or other lung pathology noted on prior chest films that would have predisposed her to lung rupture. Rather, because subcutaneous emphysema became manifest immediately after insertion of the oxygen cannula, it is likely that the cannula went beyond the distal end of the ETT and perforated either the distal trachea or the left mainstem bronchus. The deep position of the ETT may have predisposed this patient’s carina to recurrent trauma during routine suctioning, thus rendering it susceptible to puncture by the blunt, silastic oxygen cannula.
This mechanism is different from that postulated in previously published reports of similar cases. In the two cases described by Bar-Joseph et al., the development of brady-cardia and hypotension lagged behind the introduction of the oxygen cannula by 1–2 min. This led the authors to conclude that in their cases, tension pneumothorax developed as the result of massive air trapping beyond a cannula that was obstructing the airway. A similar explanation was used to explain the development of "subcutaneous emphysema and thoracic inflation" reported by Marks and Zisfein as part of a case series examining the efficacy of the apneic oxygenation method in preventing hypoxemia. Similarly, Saposnik et al. describe the onset of pneumothorax and pneumoperitoneum followed by cardiac arrest that occurred 2 min after the oxygen cannula was inserted during apneic oxygenation. The onset of subcutaneous emphysema immediately after insertion of the oxygen cannula makes this mechanism extremely unlikely in our patient.

Our patient serves as a dramatic example of the potential for serious complications during apnea testing. Given the high rate of complications associated with the apneic oxygenation method, some of which are catastrophic, other potentially safer apnea testing methods such as artificial carbon dioxide augmentation should continue to be investigated. If the apneic oxygenation method is used, we strongly discourage the insertion of an oxygen cannula into the ETT. Safer, yet equally effective methods for providing supplemental oxygen, including bulk diffusion, T-piece systems, and continuous positive airway pressure systems should be used instead.

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References


Malignant cerebellar ganglioglioma

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Abstract

We present a 62-year-old man with a high-grade cerebellar ganglioglioma with ataxia. Gangliogliomas are rare tumours which usually occur in the first 3 decades of life. There have only been a small number of grade IV gangliogliomas reported in the literature.

Keywords: Ganglioglioma; Cerebellar; Glioblastoma multiforme; High grade

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