






Fatal Foley catheter misplacement into brain of patient with craniofacial trauma and massive nosebleed

Jan Stefaniak , Alicja Filipczyk , Magdalena Wujtewicz , Aleksander Aszkiełowicz 

Department of Anaesthesiology and Intensive Therapy, Faculty of Medicine, Medical University of Gdansk, Gdansk, Poland

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To the Editors

Road traffic accidents (RTAs) and their effects depend on various factors including local road rules, road conditions, driver attitudes and vehicle type. RTAs are estimated to cause between 5 and 15% of facial injuries in developed countries. Additionally, they are often combined with injuries to other body systems and can have significant morbidity and mortality, such as in the case of head traumata which are frequently associated with craniofacial injuries [1]. We herein present the case of a 59 year-old male who suffered from complicated management of nasal cavity bleeding.

The individual was admitted to the emergency department (ED) following a polytrauma he had suffered as a result of being a pedestrian hit by a car. At the scene, the patient was in grave condition, unconscious, and estimated to be at 4 points on the Glasgow Coma Scale (GCS). Massive bleeding from the mouth and nasal cavity was visible. After sucking out approximately 1.5 L of blood, the trachea was intubated. Thereafter, anterior nasal cavity and oral cavity packing was performed. A few minutes later, a brief cardiac arrest in a nonshockable rhythm took place, probably due to persistent massive bleeding from the nose or mouth or to the bilateral pneumothorax that was subsequently decompressed. Because of insufficient control of the bleeding, two Foley catheters were introduced consecutively into the nasal cavities at 10-cm depth; the sealing balloons were inflated, and bleeding was reduced. Subsequently, the patient was transferred to the ED by the Helicopter Emergency Medical Service (HEMS).

On admission, the patient was unconscious; his airway was secured with an endotracheal tube, and he was mechanically ventilated and severely hypotensive with arterial blood pressure of 60/40 mmHg. Circulation was supported with a continuous infusion of catecholamines. On physical examination, the patient was estimated to be at 3 points on the GCS and there was massive injury to the soft and bony parts of the head, predominantly on the left side. Anisocoria was observed, with broadening of the left pupil, and blood was present in both external auditory meatuses. The nasal cavities were both secured in the prehospital phase with Foley catheters. Moreover, the patient was diagnosed with flail chest and deformation of the right knee.

Because of chest wall instability due to rib and sternum fractures, the pleural cavities were punctured and drained. On the traumatic whole body CT scan, a multifragment fracture of the frontal and parietal bones, with penetration of some bony pieces into the brain, and a subarachnoid haemorrhage were revealed. Furthermore, various fractures of the skull were identified, oedema of the brain's left hemisphere with herniation under the falx, and a fracture in the first cervical vertebra. Apart from the aforementioned injuries, a Foley catheter penetrating from the left nasal cavity through the cranial base and right lateral ventricle into the lateral parts of the right hemisphere was visualised (Fig. 1). The patient was immediately transferred to the operating room (OR) where both neurosurgical and laryngological interventions were performed. The neurosurgeons evacuated the iuxtacerebral haemorrhage, and the laryngologists removed the Foley

Address for correspondence: Jan Stefaniak, Department of Anaesthesiology and Intensive Therapy, Faculty of Medicine, Medical University of Gdansk, Gdansk, Poland; e-mail: j.stefaniak@gumed.edu.pl

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Figure 1. Localization of Foley catheter inside the skull

catheter penetrating to the brain and placed another catheter to execute correct posterior nasal cavity tamponade.

On admission to the intensive care unit (ICU), the patient was severely unstable, hypotensive, areflexic and anaemic. He required massive fluid therapy, intensive catecholamine infusion of both epinephrine and norepinephrine, red blood cells, platelets, clotting factors transfusions and active heating. The initial treatment resulted in partial stabilisation of the patient's haemodynamics. On day one in the ICU, for a short period of time, a cough reflex was present, with no reaction of the pupils to light, and the infusion of sedatives was augmented. The patient's injuries were so severe that he died on day 9 after admission.

Management at the scene of an injury such as the one described above is always a challenge. Some authors have suggested that the management of any nasal bleeding should be assessed by following the ABC (airway-breathing-circulation) approach, which took place in this particular case. Bearing in mind a potential source of blood loss, anterior packing was performed. Forasmuch as the bleeding did not stop and was a potential cause of cardiac arrest, a decision to perform posterior packing was made. In such cases, Beck et al. [2] have suggested transferring the patient immediately to a hospital, where an invasive procedure to stop the bleeding can be performed. But conflicting opinion was presented by

Diamond et al. [3] who suggested performing posterior nasal packing, preferably using a dedicated device, but an indwelling urinary catheter, not licensed for such usage, was determined to be sufficient as well. A review of the literature revealed that dislocation of foreign bodies inserted into the nasal cavity in patients with craniofacial injuries concerns nasogastric tubes. This is why the authors recommend the placement of a nasogastric tube in patients with such traumata either under direct visualisation or after confirming the integrity of the skull's base.

Mortality consequent to unintended intracerebral malpositioning of a nasogastric tube is reported to be greater than 50%, and complications can include hemiparesis or intracranial bleeding. Foley catheters for posterior packing in emergency situations are used commonly, albeit out of label although in accordance with current guidelines concerning epistaxis management [3, 4].

They should be treated in a similar way to the nasogastric tube and inserted under direct visualisation along the inferior meatus or with radiographic confirmation of the tip's position [5]. Neither of these methods was possible at the scene of the accident.

The patient's initial prognosis was highly unfavourable, and it will remain a matter of discussion as to whether inadvertent insertion of the catheter into the brain's parenchyma did or did not aggravate this.

What is certain is that any intervention in the nasopharyngeal area in patients suffering from craniofacial trauma should be performed very carefully, after considering the risks and benefits of such an intervention, and being aware of the possibility of such a rare but life-threatening complication.

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