Nitrous oxide as a cause of internal iliac artery occlusion balloon rupture

Protoxyde d’azote comme cause de rupture d’un ballonnet d’occlusion artérielle

Keywords: Anesthesia; General, nitrous oxide; Diffusion, pregnancy, complications; Placenta percreta, Cesarean hysterectomy, Internal iliac (hypogastric) artery occlusion balloons

Mots clés : Anesthésie générale ; Complication ; Placenta percreta ; Césarienne ; Protoxyde d’azote

The predominant constituent in closed gas/air-containing spaces in human body is nitrogen, the blood solubility of which is approximately 30 times less than solubility of nitrous oxide. Subsequently, closed air-containing spaces such as pneumothorax, air embolus or pneumocephalus markedly expand as more nitrous oxide diffuses into these spaces than nitrogen diffuses out of them under nitrous-based general anesthesia [1]. Nitrous oxide also diffuses into the cuff of an endotracheal tube and may lead to a marked increase in cuff pressure, which could result in significant airway management complications (e.g., high cuff pressure-related ischemia of the tracheal mucosa) [1,2]. It is therefore reasonable to speculate that other air-filled medical devices (e.g., endovascular occlusion balloons) may malfunction (e.g., rupture) when exposed to nitrous-based general anesthesia.

Indeed, we recently encountered a 27-year-old otherwise healthy parturient with the diagnosis of placenta percreta at 37 weeks gestation who required elective Cesarean hysterectomy under nitrous oxide (60%)-based general anesthesia. Internal iliac (hypogastric) artery occlusion balloons (Cook Inc, Bloomington, IN, USA) were placed preoperatively as per our routine protocol [3] through the femoral arteries for selective catheterization of the anterior division of the internal iliac arteries bilaterally. The balloons were inflated with 3 ml of air each intraoperatively to control the bleeding. Because of the emergent need for arterial occlusion, nitrous oxide was discontinued only 2–3 min prior to balloon inflation. Nevertheless, following the surgery and anesthesia the right internal iliac occlusion balloon was found ruptured (as confirmed by the interventional radiologist). The most likely etiology of an internal iliac artery occlusion balloon rupture described in our report was nitrous oxide. To the best of our knowledge, this complication has not been previously reported. In conclusion, it might be prudent to avoid administration of nitrous oxide in pregnant patients with internal iliac artery occlusion balloons in situ undergoing Cesarean hysterectomy under general anesthesia.

Références