

## Unilateral bronchospasm during microcatheter manipulation in an interventional neuroradiology suite

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To the Editor:

Bronchospasm during general anesthesia has many etiologies, including the patient's intrinsic disease and mechanical, chemical or neurogenic causes [1, 2]. Reactions to drugs used for embolization and contrast drugs are important causes of bronchospasm in patients undergoing interventional radiological procedures [3, 4]. Unilateral bronchospasm per se is a known but rare entity. We report a case where manipulations of intercostal artery by a microcatheter led to acute unilateral bronchospasm. A 2-year-old girl weighing 12 kg and 65 cm in height was electively scheduled for glue embolization of dorsal (D2) spinal arteriovenous malformation under general anesthesia. Her pre-operative respiratory and cardiovascular examinations were normal. The child was premedicated with oral atropine 0.3 mg an hour before the procedure. General anesthesia was induced with propofol 2 mg kg<sup>-1</sup> and fentanyl 2 µg kg<sup>-1</sup>. A 4-mm ID uncuffed endotracheal tube was placed after complete muscle relaxation, which was achieved with the administration of rocuronium 1 mg kg<sup>-1</sup>. The tube was fixed at the 12 cm mark at the angle of the mouth. Anesthesia was maintained with isoflurane in a mixture of nitrous oxide and oxygen (2:1) and intermittent boluses of fentanyl 1 mcg kg<sup>-1</sup> and rocuronium 0.1 mg kg<sup>-1</sup>. The procedure was performed in the supine position. Forty-five minutes

later, the patient had a sudden increase in airway pressure (from 10 to 22 cm H<sub>2</sub>O) followed by an increase in expired carbon dioxide partial pressure (from 34 to 48 mmHg) and a decrease in peripheral oxygen saturation. On auscultation of the chest, air entry was found to be diminished on the left side along with wheezing and ronchi all over the left lung field. Possible causes of intraoperative bronchospasm such as endobronchial displacement of the tracheal tube, oropharyngeal secretions and inadequate depth of anesthesia and analgesia were ruled out, and after proper oral and tracheal tube suctioning, a combination of theophylline and etophylline was administered along with hydrocortisone. By this time the radiologist had stopped the procedure, as the patient was being managed for bronchospasm. The radiographic image of the chest did not reveal any obvious abnormality and the lung fields appeared normal. On discussing with the radiologist, it was found that he was manipulating the microcatheter through intercostal artery on the side concerned when the problem was noted. Nearly 30–40 min later, following conservative management, the bronchospasm was relieved and the procedure was allowed to continue. The unilateral nature of bronchospasm rules out the possibility of contrast media as the etiology of intraoperative bronchospasm in our patient. The onset and presence of spasm exclusively on the side of catheter manipulation in the intercostal artery is highly suggestive of the possible etiology. It is likely that stimulation of the bronchial artery at its origin from the intercostal artery might have produced vessel spasm and triggered a series of events resulting in bronchospasm. Though it is difficult to speculate about the exact mechanism of bronchospasm, the possibility of some neural or chemical mediators can always be anticipated, as bronchial musculature is always under the influence of parasympathetic tone. Subsequent negotiation of the catheter through the vessel at a later stage did not produce

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bronchospasm, and the procedure was completed uneventfully. This could be due to the fact that the catheter had now passed the affected intercostal artery and so the effect could no longer be produced. Our case demonstrates that microcatheter manipulation is a rare but possible cause of bronchospasm in an interventional neuroradiological suite. Withholding the procedure for some time until complete recovery may be a logical step during management.

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