

## Puncture of Endotracheal-tube Cuffs during Percutaneous Subclavian-vein Catheterization

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In a recent article in ANESTHESIOLOGY, puncture of an endotracheal-tube cuff during percutaneous internal jugular vein cannulation was reported.<sup>1</sup> The same complication has since occurred twice at our institution during percutaneous subclavian vein catheterization.

### REPORT OF TWO CASES

*Case 1.* A 73-year-old man was scheduled for exploratory laparotomy. Preoperative chest roentgenogram revealed mediastinal shift and deviation of the trachea to the right, a result of previous right upper lobectomy. After general anesthesia had been induced and the trachea intubated, a right percutaneous subclavian venipuncture with a 14-gauge 2½-inch needle (Deseret), a persistent air leak in the previously sealed endotracheal tube cuff was noticed. The trachea was reintubated with another tube. Examination revealed a laceration in the cuff of the first tube. Subclavian vein catheterization was abandoned and a left antecubital cutdown was performed instead. The operation proceeded uneventfully. Roentgenograms of the chest taken on postoperative days 1, 2, and 5 were negative for pneumothorax, pneumomediastinum, and subcutaneous emphysema. A roentgenogram on postoperative day 4 revealed a shallow pneumothorax at the right apex. The postoperative course was uneventful.

*Case 2.* A 52-year-old man scheduled for thoracoabdominal exploration was anesthetized and the trachea intubated. A preoperative roentgenogram of the chest disclosed no abnormal-

ity. During attempted right percutaneous subclavian venipuncture with a 14-gauge 2½-inch needle (Deseret), an air leak in the previously sealed endotracheal tube cuff was noted. The leak persisted, and the trachea was reintubated with another tube. A tear in the original endotracheal tube cuff was found on inspection. Subclavian venipuncture was abandoned and a right external jugular catheter was inserted. Partial resection of a retroperitoneal sarcoma was performed without entering the thoracic cavity. Two postoperative roentgenograms of the chest, on the night of operation and on day 6, revealed no pneumothorax, pneumomediastinum, or subcutaneous emphysema.

### DISCUSSION

Borja<sup>2</sup> listed 19 complications of infraclavicular subclavian vein catheterization. Chief among them were pneumothorax, hemothorax, hydrothorax, air embolism, and infection. We were unable to find published reports of puncture of an endotracheal tube cuff during this procedure.

In our cases, the individuals performing the procedures, a thoracic surgeon (Dr. Burnard), and a general surgeon (Dr. Jensen), had both previously done many subclavian venipunctures. The usual care and diligence were exercised on these occasions. Thus, lack of knowledge of anatomy, inexperience with the technique, or carelessness, cannot be cited here as a factor in causing this complication. Deviation of the trachea to the right in Case 1 could have been a contributing factor.

As stated in the other published report, no serious sequela resulted from the puncture of the trachea. The small pneumothorax on the fourth postoperative day in Case 1 was of no clinical significance, and its relationship to the tracheal puncture was questionable.

Had it not been for the rapid deflation of a previously sealed endotracheal-tube cuff, puncture of the trachea probably would have gone unnoticed both times. We therefore speculate that this complication is not un-

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common, but it has not been reported until recently because it is usually not recognized, and seldom results in harm. Individuals who perform this procedure should be aware of the possibility of its occurrence.

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## REFERENCES

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## *Serratia* Bacteremia from Mean Arterial Pressure Monitors

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Mean arterial pressure (MAP) data in the critically ill patient has become a readily available diagnostic tool since indwelling arterial cannulas have come into widespread use.<sup>1,2</sup> Although many electronic pressure transducers are currently available, a simple, semidisposable manometer provides similar results at only a fraction of the cost of the electronic apparatus.<sup>3,4</sup>

For the past three years we have routinely utilized such a disposable device, incorporating an aneroid manometer attached to a syringe filled with heparinized saline solu-

tion (fig. 1). This unit is assembled by our Blood Gas Laboratory and then attached to a continuous-flush device of the arterial line.<sup>5</sup>

During a six-week period, from May 1 to June 15, 1973, six patients in our Intensive Care Area were found to have *Serratia marcescens* bacteremia. Cross-contamination by inhalation therapy instruments<sup>6</sup> was found not to be the cause of the bacteremia. Although all five patients received some type of care from the Respiratory Therapy Department, cultures of the equipment used were negative. However, in cooperation with the Infectious Disease Service, the source of the infection for five of the six patients was found to be associated with the arterial line. Further investigation revealed a positive culture of *Serratia* in the stock solution of heparinized saline solution used to fill the MAP manometers. All five of these cannulated patients had had mean arterial pressure determinations at some time during their stays in the ICA.

Previous to the outbreak of the *Serratia* bacteremia, the method of filling the outer sleeve of the MAP assembly utilized a stock solution popular in many midwestern hospitals. Our solution was prepared by mixing 10 ml of sterile sodium heparin (1,000 units/ml) into 1,000 ml of sterile physiologic saline solution. This quantity supplied approximately 50 MAP sets and would last two to four weeks.

Since June 15, 1973, all MAP components

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