of the ETT into the trachea. The described corrective measures could facilitate passage of the ETT in problem cases of BLS guided oral tracheal intubations.

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Epidural injection of aztreonam

To the Editor:

A 47-yr-old, 41-kg woman underwent right thoracotomy. A lumbar epidural catheter was placed at L_{2-3} at the conclusion of surgery, and a bolus of 100 μg of fentanyl was administered. The patient was transferred to the recovery room where a continuous infusion of what was assumed to be fentanyl had been started at a rate of 4 ml · hr (usual concentration 10 $\mu g \cdot ml^{-1}$) and was increased to 6 $ml \cdot hr^{-1}$ due to lack of response. A few hours later, in the intensive care unit, it was found that the epidural infusion contained aztreonam (1 g in 100 ml D5W) and not fentanyl. It was discontinued and the catheter aspirated, but yielded no fluid. It was then removed. A thorough general and neurological examination was essentially normal. During a two year follow-up there were no sequelae.

Aztreonam injectin is a frozen, iso-osmotic, sterile, sodium-free, nonpyrogenic intravenous solution. Each 50 ml of 1 gram solution contains 1.7 dextrose hydrous added to adjust osmolality and approximately 730 mg of arginine for pH adjustments. Thawed solution has a pH in the range of 4.5–7.5 (5.5 in our case). Phlebitis or thrombophlebitis have been reported after *iv* administration and discomfort or swelling at intramuscular injection sites.[1] Systemic reactions to aztreonam are uncommon (< 1%) and usually mild.[1] This drug was found to be a non-irritant while administered into the epidural space.

Epidural injections have been reported for several medications.[2,3] The approach to treatment in cases of unintended epidural injection is not unanimous and lacks the research basis and clinical experience. In many cases, other drugs, especially local anaesthetics, epinephrine, or narcotics have already been present in the epidural space. The influence of these drugs on the immediate clincial impact as well as ultimate prognosis remains unknown. Reported approaches include dilution of the drug within the epidural space, epidural or systemic steroids, epidural local anaesthetics or hyaluronidase or no further action, but symptomatic care.

Prevention is a key point. Epidural tubing should contain no side ports. It should have a Luer-Lock type connector and be managed by trained personnel. Colour coding of the tubing and the use of water soluble dye have also been suggested. But above all, the human factor is the most important. Constant vigilance is mandatory in identifying solutions for injection. Ampoules must be clearly labelled and carefully read. Charged syringes should also be clearly labelled. Those for epidural injection should not be mixed, or put aside, with those for intravenous administration.

Since continuous epidural infusions increase in popularity, all of the above measures are essential to minimize the risk of having the wrong drugs mistakenly injected into the epidural space.

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