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Anesthesiologists' Placement of Cannulae for Cardiopulmonary Bypass

To the Editor:

I read with interest the recent case conference by Bartal et al[1] discussing percutaneous superior vena cava cannulation performed by anesthesiologists for cardiac procedures requiring a repeat sternotomy. New approaches to cardiac surgery and cardiopulmonary bypass use the skills of anesthesiologists to place catheters in the superior vena cava as well as the coronary sinus and the pulmonary artery. These cannulae are not used as monitors but as components of the cardiopulmonary bypass circuit, replacing those that formerly were placed by the surgeon on the operative field. The placement of these cannulae requires not only technical proficiency and knowledge of potential complications but may also entail additional involvement of the anesthesiologist in the direct conduct of cardiopulmonary bypass. Control of catheter patency using clamps, stopcocks, and catheter positioning may become duties of the anesthesiologist, along with the coordination of these activities with the needs of the surgeon and perfusionist. Because tubing connections and the occlusion status of neck lines may not be visible to the surgeon or perfusionist, clear communication among all practitioners is essential.

As surgical practices continue to evolve, protocols that define the responsibilities of each team member in the management of cannulae placed by anesthesiologists for use in the cardiopulmonary bypass circuit will help to ensure patient safety in these increasingly complex circumstances.

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Success Rate, Decubitus Position, and Vagal Reflex During a High Thoracic Epidural for Coronary Artery Surgery

To the Editor:

We read with interest the article by Nishi and coworkers[1] comparing the safety and success rates associated with the placement of a high thoracic epidural catheter (HTEA) in the sitting versus the lateral decubitus positions on patients scheduled for off-pump coronary artery bypass graft surgery (OPCAB). They found a very similar success rate in both sitting and lateral decubitus positions (70% and 71%, respectively), but 20% of patients in the sitting position developed a vagal reflex during epidural catheterization whereas none did in the lateral decubitus group. Consequently, the authors recommended the lateral position be used for high thoracic epidural catheterization in patients scheduled for OPCAB.

We have had a different experience and, therefore, would like to share our data and to make some comments. We have previously reported our success rate and incidence of vagal reflexes defined as dizziness, perspiration, pallor, bradycardia, and later hypotension in 106 patients undergoing HTEA.[2] Failure occurred in only 2 patients, 1 for a bloody tap and the other, although not specified in the article, was for a vagal reflex, a success rate of 98% and an incidence of vagal reflex of 0.9%. In another series of 462 patients, we obtained successful HTEA in 417 patients (90.2%), and only 3 patients (0.6%) experienced vagal simptoms.[3] Furthermore, unpublished data retrieved from our department database including 755 patients show a success rate of 88.6% (669 patients) and an incidence of vagal reflex of 1% (8 patients).

It is important to clarify the different approach used by Nishi et al compared with our technique. Nishi and colleagues placed the

HTEA catheter on the day before surgery in unpremedicated patients by using the midline approach (in the sitting group) with a hanging-drop technique. Three experienced anesthesiologists performed the blocks and the "failed cases" were removed from the epidural catheterization group because of either hypotension and bradycardia, patient refusal because of pain, placement of the epidural catheter not achieved within 10 minutes, epidurography showing incorrect placement of the catheter tip, or a bloody tap.

We insert the epidural catheter the same day of surgery in patients premedicated with morphine, 0.1 mg/kg, and atropine, 0.07 mg/kg. The interspace, the approach (midline), and the technique of epidural space identification (hanging drop) are exactly the same. We always use the sitting position because, in agreement with Nishi et al, we believe it is the easiest. All 11 staff anesthesiologists, with different skills in neuraxial blocks, are involved in HTEA. We have defined failed HTEA cases as follows: failure to identify the epidural space after a maximum of 3 punctures, inability to insert the catheter, a block extension less than T1-T7 as assessed by an ice test preoperatively, tachycardia and hypertension at sternotomy suggesting poor sympathetic blockade, poor analgesia after surgery, evidence of blood or cerebrospinal fluid in the needle or in the catheter, or vagal symptoms requiring us to abort the procedure. In our experience, atropine, 0.5 mg, administered 1 hour before HTEA reduced the rate of vagal reflex to about 1%, and we do not think that the slight tachycardia induced by atropine is harmful for patients with ischemic heart disease.

Concerning the mechanism of vagal reflexes described in the cited article, we are in agreement only with the second hypothesis (blood shift). Indeed, we have noted that the vagal reflexes occurred before puncturing the back of patients, often in young males. We treat this syndrome by returning the patient to the supine decubitus position and sometimes giving atropine, 0.5 mg. Furthermore, we have learned with experience that the best method to avoid vagal reflexes is to place the patient in the sitting position by raising the back of the bed gradually (10 minutes). With these easy and simple techniques (premedication and slow positioning), we inform our patients of a success rate near 90%. Therefore, we do not agree with the authors' recommendation that the lateral position should be used for high thoracic epidural catheterization in patients scheduled for OPCAB.

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Additional Information on the Pulsatile Pressure Waveform

To the Editor:

We read with interest the article by Lennox et al, "A Pulsatile Pressure Waveform is a Sensitive Marker for Confirming the Location of the Thoracic Epidural Space."[1] They concluded that a stiffer multiorificed epidural catheter is better able to transmit pulsations from the epidural space than a single-orifice catheter. They failed to mention our previous work on the subject.

In a prospective study of 218 patients undergoing various abdominal and thoracic procedures using the Arrow FlexTip plus catheter (Arrow International Inc, Reading, PA), we found a sensitivity of 81% of the pulsative waveform (what we called epidural pressure wave analysis [EPWA]) after injecting 5 mL of 0.9% saline in the catheter. In our study, level of epidural insertion, median versus paramedian approach, sex, and body mass index did not modify the sensitivity of the EPWA. Age significantly improved the sensitivity from 63% for ages 20 to 39 to 94% for patients 80 and older.[2] In comparison, Lennox et al[1] found a sensitivity of 55.6% with the Arrow FexTip and 88.9% for the SIMS Portex multiorifice (Smiths Medical MD Inc, St Paul, MN) after an injection of 3 mL of lidocaine (27 patients each).

In a second prospective study, we compared the dose-response curve of 3 different catheters (Portex [stiff 3-holes], Portex Duraflex [soft 3-holes], and Arrow Flextip plus [soft 1-hole]). We did find that 3-hole catheters performed better at low volume of injectate, that catheter stiffness did not improve epidural wave transmission, and that increased volume of injectate increased the sensitivity of EPWA. The ideal initial volume to inject through the catheters appeared to be 5 mL.[3]