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Cava-Catheterization via EJV Revisited

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Common and differences between 2 studies on EJV cannulation carried out in Russia and India were analyzed. A table to determine a depth of CV catheter insertion via various routes is given.

We were very glad to read an article by Chakravarthy et al. [1] describing their experience of using external jugular vein for central venous access, which mainly confirmed ideology and results of our own research [2], carried out in 2009, accepted in 2010 and published in the beginning of 2011.

In spite of slight differences in design (1 manipulator; 194 central venous catheterizations in 174 patients; no insertions of Swan Ganz, dialysis or pacing catheters; no ultrasound for IJV or EJV cannulation in our series), two studies offered identical approaches to overcome difficulties in the intrathoracic passage of guide-wire and came to the same conclusions about relative ease and safety of cava-catheterization through EJV and importance of the first attempt at cannulation.

The only noticeable dissonance in results–less frequent malposition of catheter tip in Indian study (17 malpositioned catheters in 411 cannulations vs. 22 malpositioned catheters in 99 cannulations of EJV)–is most probably associated with difference in sample size and use of thicker and stiffer catheters and introducers when inserting Swan Ganz, dialysis or pacing catheters. The last point was presumably the reason that our colleges never observed (or ignored) such a variant of malposition of catheter as its looping in EJV (8 loopings in EJV from total 22 malpositions of catheter tip in our study).

Besides these small discrepancies we are obliged to stress few points which in our view are paramount to successful use of this method. Right EJV is not in any way superior to the left one. To the opposite, cava-catheterization through left EJV seemed to us easier (less attempts at intrathoracic passage of a guidewire; quicker procedure) despite insignificant difference in efficacy (which could turn out significant with larger sample size). That phenomenon is difficult to explain definitely and may be associated with asymmetry in brachicephalic veins and their supplying vessels [3]. This asymmetry dates back to the first weeks of embryonic development and is beyond scope of our research [4]. Whatever the cause we prefer left-sided approach now.

We are not afraid of additional skin defects when converting to IJV cannulation, so we try to puncture EJV in its lower portion–as close to clavicle as possible. This approach allows to avoid mid-portion valves and to manipulate on the least mobile part of EJV. When passing a cannula into the chest cavity we use the special table to determine depth of introducing a catheter through right or left EJV, IJV and SCV into either upper or middle portion of SVC (but not the right ventricle). Usefulness of this table was proven by 194 postprocedural X-rays (in 87% cases catheter tip was between lower margin of right clavicle and upper contour of the right heart), table 1.

Approach to cava-catheterization	Distance from puncture site to atriocaval junction (cm) [5]	Depth of catheter advance (cm)
Right IJV	16	12
Right SCV	18,4	15
Right EJV	ND	15-17
Left IJV	19,1	16
Left SCV	21,2	18
Left EJV	ND	18-20

Note. ND – no data

Table 1: Depth of central venous catheter advance through various veins carrying blood to SVC.

Presently, we are working at regional guideline based on the algorithm for CV access, crudely featured by Schwartz et al. [6]. This implies cava-catheterization through EJV as a first-attempt, through ipsilateral IJV as a second-attempt, and through ipsilateral SCV–as a third-attempt method (excluding true emergencies, when the straightest way to SVC should be sought).

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