Intraosseous Vascular Access In Adult Anesthesia: A Vastly Underutilized Procedure

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My opinion

As anesthesiologists we are trained extensively to deal with what is for many of us a once-in-a-career event, the need for a surgical airway. But those of us who treat only adults are likely unfamiliar with a procedure to help skirt a much more common, but equally life-threatening problem: difficult vascular access in a profoundly hypovolemic patient. Perhaps the time has come for us to pick up a tip from our colleagues in pediatrics who have long been using the intraosseous (IO) route in their patients in whom conventional vascular access proves to be impractical.

At a hands-on workshop at a recent conference I had an opportunity to play with two FDA approved systems for intraosseous vascular access. Human volunteers being in short supply, we used turkey legs to get some skill in this marvelously simple technique. This experience got me wondering why intraosseous vascular access is so rarely used by the adult anesthesia community. Certainly I have many vivid memories of patients in hypovolemic shock in whom vascular access was extremely difficult. And yet, in all these cases, some with mortal outcomes, the idea of starting an intraosseous line in the tibia, humerus, or sternum never arose, our efforts always being rigidly focused on opportunities for peripheral or central venous access.

This situation is unfortunate, since the intramedullary space, where an intraosseous needle ordinarily is sited, is highly vascular, providing a direct path to the systemic circulation that can be established in mere minutes. Furthermore, numerous studies support the notion that cannulating the intramedullary space is generally safe and effective for the administration of medications, crystalloids, colloids, and even blood products [e.g., 1-7].

The American Academy of Pediatrics has long recommended using the intraosseous route when vascular access in children becomes crucial but when peripheral venous access is not possible, and the American Heart Association now recommends that intraosseous access be used in cases of delayed or failed intravenous access in patients with sudden cardiac arrest. Mahajan et al. [8] point out an additional advantage for intraosseous vascular access, noting that “recent studies comparing IO access to peripheral and central venous access in prehospital medical emergency situations and in emergency departments showed that the time required to establish IO infusion was significantly less than that required for peripheral IV infusion by individuals wearing protective equipment during chemical, biological, radiological, and nuclear” emergencies [9]. They go on to recommend that a “change in practice of central venous cannulation to immediate IO access for initial emergency resuscitation should be strongly considered as a reasonable bridging technique in emergency situations if peripheral IV access has been unsuccessful 3 times over a maximum duration of 2 minutes” [8].

So why is the adult anesthesia community so unfamiliar with this simple technique? I invite discussion of this very important topic. I also invite individuals to see how simple the technique really is by viewing some of the many instructional videos on YouTube.

Reference(s)

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