

# Arterial Line Placement Using Modified Seldinger Technique: A Novel Approach

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## Dear Editor,

Arterial cannulation plays a crucial role in managing sick patients in both perioperative and intensive care settings. Arterial lines are utilized for continuous 'beat-to-beat' BP monitoring, when non-invasive blood pressure monitoring is impractical, when frequent arterial blood sampling is required, and for advanced hemodynamic monitoring.<sup>1</sup> The radial artery is the most commonly used site for establishing an arterial line due to its consistent anatomic accessibility, relative ease of cannulation, and low rate of complications. The palpation-guided technique is often used with a good success rate in the hands of an experienced intensivist.<sup>2</sup>

However, there are times when using the palpation-guided technique can become technically difficult in that subset of patients with edema, obesity, or hypotension. This may lead to multiple attempts in securing the line. This, in turn, may lead to hematoma formation or arterial spasms which would render the artery unusable and unsalvageable. Moreover, difficult arterial line placements have proven to be a significant contributor to reduced operating room efficiency due to procedural time delays and may have a negative impact on patient outcomes.<sup>3</sup> This problem could be mitigated to an extent by using an ultrasound-guided approach.<sup>4</sup> However, an ultrasound machine dedicated to the purposes of vascular access will not be available at several low-cost medical setups.

Another way to rectify this potential issue of securing a radial arterial line is by opting to use Seldinger's technique instead. Multiple studies have shown that using a direct Seldinger's guide wire-assisted technique yields better results in salvaging as well as establishing an arterial line with the reduced number of attempts and minimal complications.<sup>4,5</sup> Dedicated arterial cannulas make use of this technique and are commercially available. However, these cannulas are expensive and not feasible in low-cost settings. Hence, the go-to device is the cheaper and more widely available peripheral intravenous cannula.<sup>1</sup>

Smaller size Foleys catheter comes with a guide wire which is routinely used for certain urological and gynecological procedures. This is utilized when a smaller size Foley's urinary catheter is required to be inserted in patients with a potential obstruction of the lower urinary tract (Fig. 1).<sup>6</sup> This guide wire can be freely passed through the style of an appropriately sized intra-venous cannula (Fig. 2). The length of the guide wire is more than sufficient for the purpose of cannulating the radial artery. Moreover, the blunt tip of the guide wire will be atraumatic to the vessel wall and sterility can

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**Fig. 1:** Size 10 Fr Foley's catheter and guide wire

also be maintained. Hence, modified Seldinger's technique could be utilized with an intra-venous cannula to establish radial arterial lines in low-cost settings and could reduce the complications associated with repeated attempts at securing an arterial line. However, further studies are required to assess the success rate and feasibility of using this technique.



**Fig. 2:** Guide wire passed through stylet of 20 Gauge intra-venous cannula

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