



Non-Circumferential "Tourniquet" for Neck Vein Cannulation

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My opinion

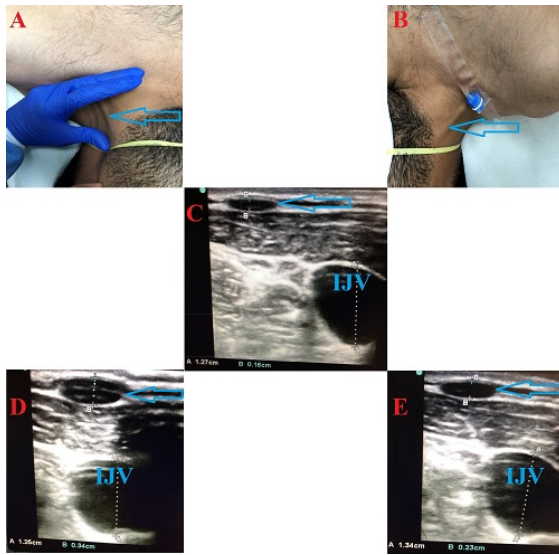
To engorge neck veins for cannulation, proceduralists (a) turn patients into Trendelenburg position and/or (b) ask patients to hold breath and/or (c) passively raise patients' leg and/or (d) ask assistants to apply supraclavicular occlusive digital pressure just proximal to "towards heart" site of venous cannulation [1-3]. However, these maneuvers may not be feasible during emergent cannulation of neck veins intraoperatively. Therefore, on the lines of circumferential hand tourniquets replacing assistants circumferentially constricting extremities to engorge veins for cannulation, we suggest a non-circumferential tourniquet as an alternative to supraclavicular occlusive digital pressure by an assistant. Peck had objectively demonstrated application of stethoscope's pressure to engorge external jugular vein and thereafter with Foster patented its improvised version as an apparatus to be utilized for external jugular vein cannulation [4-5]. Analogously, there may be two options. Per option A (Figure 1 (A)), proceduralists may curve their non-dominant hands into a C-shape with their four fingers pressing supraclavicular tissues posteriorly while their thumbs stretching the skin cranially to allow access of the engorged veins by their dominant hands. If proceduralists are concerned about inadvertent needlestick injuries to their non-dominant hands while accessing the engorged veins as per option A, they may consider using option B (Figure 1(B)) wherein 1-inch-by-18-inch latex-free blue-colored rolled tourniquet which routinely comes in sterile IV start kits may be adhered to 1-inch tape and thereafter applied at supraclavicular site to occlude external jugular vein proximally and visibly engorge it distally for cannulation. However, while cannulating internal jugular vein, appropriate position of option A or B may have to be judged per ultrasonographically visible changes in internal jugular vein's caliber.

Per our self-investigation on ourselves, as compared to normal ultrasonographic antero-posterior caliber of external jugular vein of co-author (MG) in supine position (Figure 1(C)), the C-shaped non-dominant hand of co-author (DG) increased MG's external jugular vein's ultrasonographic caliber from 0.16

cm to 0.34 cm (Figure 1(D)) while blue-colored rolled tourniquet only increased it to 0.23 cm (Figure 1(E)). Although the contact pressure of ultrasound probe itself can change the caliber of superficial veins being visualized, the antero-posterior caliber of MG's internal jugular vein did not vary much between the three visualizations (Figure 1(C-E)). Moreover, as compared to applied blue-colored rolled tourniquet's constant pressure, DG's non-dominant hand might have generated more pressure into MG's supraclavicular space thus engorging MG's external jugular vein more as similar to overzealous application of circumferential pressure on extremities improving the engorgement of peripheral veins for cannulation.

A word of caution may be warranted. As analogous to patients' tolerance for ultrasound probe-generated pressure, patients' tolerance for proceduralists' hand-generated or rolled tourniquet-generated supraclavicular pressure might have to be taken into consideration. Moreover, although this assembly may visibly engorge external jugular vein even in upright position, neck vein cannulation may have to be always attempted in supine position keeping access site at least below the level of heart because occlusive pressure of this assembly may be neither complete nor continuous thus exposing risk of air embolism during cannulation of partially engorged/full neck veins in upright patients.

Demonstration on mask-wearing MG's neck veins: DG's non-dominant hand in a C-shape (A) and blue-colored rolled tourniquet (B) engorging external jugular vein (blue arrows) with its ultrasonographic antero-posterior caliber in supine position at 0.16 cm (C) increasing to 0.34 cm (D) due to DG's non-dominant hand and to 0.23 cm (E) due to blue-colored rolled tourniquet; internal jugular vein (IJV) is also visible in all ultrasonographic frames (C-E) for comparison



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