CORRESPONDENCE

A retrograde tunnelling technique for regional anesthesia catheters: how to avoid the skin bridge

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To the Editor,

Tunnelling of continuous regional anesthesia catheters has been suggested to provide stability/reduce dislodgement¹ and to decrease the infection risk from bacterial colonization, particularly for epidural catheters.² Despite tunnelling typically involving relatively minimal time and additional equipment, it remains an underutilized technique and is not commonly taught in most training programs. Some tunnelling-related complications have been reported, including the catheter breaking off at the skin³ as well as difficulties extracting the catheter requiring surgical intervention. Thus, it is important to review several key steps of a successful retrograde tunnelling technique that can decrease the potential for catheter damage and minimize the skin bridge (i.e., infection risk from exposing the catheter at the original puncture site) that can occur with more conventional tunnelling methods.⁴ In the figure and accompanying video, the retrograde tunnelling technique is demonstrated in a porcine model.

After placing the catheter at the desired location and depth, the clinician should carefully remove the Touhy regional needle while ensuring that the catheter position remains unchanged. This is accomplished using a looping technique to stabilize the catheter while removing the

needle with deliberate and equal motions to avoid knotting the catheter while simultaneously maintaining control of the catheter position with pressure at the skin entry site. After adequate local anesthetic infiltration, the subcutaneous tunnelling begins with insertion of the styleted Touhy needle tip while directing its bevel away from the catheter. Using a sterile syringe with its plunger removed as a needle shield, one can protect from any inadvertent skin puncture to the patient and clinician as well as providing counter-pressure to aid the tunnelled Touhy in exiting through the skin. Once the tunnelling needle exits, the stylet of the Touhy needle is removed, and a sterile well-fitted guidewire (e.g., Arrow AW-14732 with outer diameter 0.032 inches/0.81 mm, Teleflex®, USA) is inserted through the 17G (inner diameter 0.036 inches/0.91 mm) or 18G (inner diameter 0.032 inches/0.81 mm) Touhy needle. Next, the needle is withdrawn while keeping the guidewire in the subcutaneous tunnel. Using the guidewire, the Touhy needle is threaded back towards the initial insertion point (i.e., the catheter). To minimize risk of catheter damage, the clinician should turn the tunnelling needle bevel 90° facing away from the catheter as the needle advances over the wire. Once again, the use of a needle shield can help avoid any inadvertent skin puncture. After removing the guidewire, the regional anesthesia catheter is fed back into the regional needle being careful not to knot the advancing catheter. Counter tension on the catheter can be applied as it passes smoothly through the regional needle, with care to avoid shearing it at the bevel. When the catheter loop has approximately 6–9 cm remaining, the regional needle can be removed leaving a small loop of catheter to be pulled through the skin. Before doing so, the catheter depth should be noted at the original insertion point before the loop disappears to ensure that the catheter position has not been inadvertently dislodged.

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Figure Photographs of retrograde tunnelling on a porcine model. A) Catheter in place and a Touhy needle tunnelling through the skin beginning where the catheter originally exited the skin. A counter-pressure syringe barrel is ready to be used as shield when the needle re-exits the skin. B) Wire being passed through the first tunnelling needle. C) The needle now reversed and tunnelling back over the wire towards the catheter. D) The catheter being inserted back into the tunnelling needle

Finally, the initial and final needle insertion sites can be covered with a sterile bio-occlusive dressing.

It is important to point out that it remains controversial whether a catheter (tunnelled or not) should be placed in those who are actively septic.⁵ In addition, the benefits of tunnelling must be weighed against the additional bleeding risks in anticoagulated patients. Overall, we found that this retrograde technique is simple to perform and avoids creating a skin bridge, which commonly occurs when utilizing the traditional tunnelling technique.

Conflict of interest None declared.

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