because of the risk of oozing and hematoma formation due to very high INR value. The article by vande Weerdt EK et al. states that there is a low incidence of major bleeding after central venous catheter placement in severe coagulopathic patients.

A recent study reported that coagulopathy was not associated with an increased risk of bleeding for ultrasound-guided CVP catheter placement.

To conclude, the patients in supratherapeutic INR level with life-threatening bleeding should be controlled by immediately available medication and blood product, and also think of risk-benefit ratio for reversal of warfarin in an emergency condition.

References
1. Gupta A, Gupta S, Manaktala U, Gupta MM, Solanki V. Conservative management of corpus luteum haemorrhage in patients on anticoagulation: A report of three cases and review of literature. Arch Gynecol Obstet 2015;291:427‑31.
2. Galhardo C Jr, Yamauchi LH, Dantas H, Guerra JC. Clinical protocols for oral anticoagulant reversal during high risk of bleeding for emergency surgical and nonsurgical settings: A narrative review. Braz J Anesthesiol 2021;71:429‑42.
3. Singh U, Agarwal R, Dhar M, Biswas S. Emergency surgery for a ruptured ovarian cyst in an anticoagulated patient with artificial mitral valve and massive haemorrhage: Maintaining a delicate balance. Indian J Anaesth 2019;63:499‑501.
4. van de Weerdt EK, Biemond BJ, Baake B, Vermin B, Binnekade JM, van Lienden KP, et al. Central venous catheter placement in coagulopathic patients: Risk factors and incidence of bleeding complications. Transfusion 2017;57:2512‑25.
5. van Baarle FL, Tisheh A, Jhingoeriesingh SS, Vlaar AP, Biemond BJ. Contribution of coagulopathy on the risk of bleeding after central venous catheter placement in critically Ill thrombocytopenic patients. Crit Care Explor 2022;4:e0621.

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Subcutaneous tunnelling of epidural catheter in four easy steps - A novel technique

Sir,

Epidural catheter insertion is used routinely in anesthesia practice for various thoracic, abdominal, pelvic, and lower limb surgeries or procedures. The epidural catheter has been found to be a safe and reliable technique for postoperative analgesia even in the pediatric population.1

There are several techniques of catheter fixation which help in the prevention of migration of epidural catheter such as looping the epidural catheter, Lockit® Plus catheter securement device (Smith Medical, Massachusetts, USA), and subcutaneous tunneling.2 Tunneling of epidural catheters has been found to significantly reduce the incidence and extent of catheter dislocation and the chances of bacterial contamination.3,4 Though there is clear evidence of the advantages of tunneling an epidural catheter, the technique is still not widely practiced by anesthetists. Several techniques for tunneling epidural catheters using guide wires have...
been described more recently. However, it can make the procedure more complex. We have described a tunneling technique that can be applied for thoracic and lumbar epidurals in adult patients, and it can be done in four easy steps.

The Technique

Step 1 - Inject lidocaine along the path of tunneling and insert a 14 G cannula subcutaneously from the site of catheter insertion to about 3–4 cm away [Figure 1a].

Step 2 - Remove the stylet and pass epidural Tuohy needle from the opposite end through the 14 G cannula [Figure 1b].

Step 3 - Remove the cannula and leave the Tuohy needle in place [Figure 1c].

Step 4 - Pass the epidural catheter through the Tuohy needle [Figure 1d].

Withdraw the catheter to allow correct length of the catheter in the epidural space, by checking the markings on the catheter at the skin level. Pull the needle out of the skin [Figure 2a]. Both the exit points should be covered with a bio-occlusive dressing [Figure 2b and c].

In order to minimize the risk of catheter damage during the introduction of the 14 G cannula, it is important to place a finger on the catheter so as not to shear it with the cannula stylet. The 14 G cannula should be introduced from the same skin puncture site as the exit of the epidural catheter in order to prevent a skin bridge under the catheter, which can lead to improper tunneling. Care should be taken while introducing the catheter through the Tuohy needle as it can shear the catheter. Catheter shearing at this step was not encountered in any of our cases. After placing the catheter at the desired length, the clinician should be cautious while removing the Tuohy needle and ensure that the catheter does not migrate outwards by holding on to the loop of the epidural catheter.

The advantages of this technique over earlier described techniques are that it is easy to learn and perform, the equipment required to perform the procedure is readily available, less chance of catheter shearing compared to the older techniques. It also avoids the formation of skin bridge which leads to ineffective tunneling, which in turn can increase the chance of catheter-related infections.

So far, we have performed this tunneling technique on 20 patients for both thoracic and lumbar epidurals with success. The catheter was left in place for the duration of 3–5 days in all of the patients. Catheter dislodgement or inward migration, kinking, or catheter shearing was not reported in any of the patients. All the patients had adequate postoperative analgesia and an average numeric rating scale (NRS) score of less than 3.

Overall, we have found this technique to be superior to the traditional tunneling techniques in terms of ease of performance and rate of successful tunneling without catheter shear.

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Not applicable.

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There are no conflicts of interest.

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**References**

1. Kasanavesi R, Gazula S, Pula R, Thakur N. Safety of post-operative epidural analgesia in the paediatric population: A retrospective analysis. Indian J Anaesth 2015;59:636-40.
2. Sharma A, Parasa S, Tejvath K, Ramachandran G. Epidural catheter fixation. A comparison of subcutaneous tunneling versus device fixation technique. J Anaesthesiol Clin Pharmacol 2016;32:65-8.
3. Sellmann T, Bierfischer V, Schmitz A, Weiss M, Rabenalt S, MacKenzie C, et al. Tunneling and suture of thoracic epidural catheters decrease the incidence of catheter dislodgement. ScientificWorldJournal 2014;2014:610635.
4. Bomberg H, Kubulus C, Herberger S, Wagenpfeil S, Kessler P, Steinfeldt T, et al. Tunnelling of thoracic epidural catheters is associated with fewer catheter-related infections: A retrospective registry analysis. Br J Anaesth 2016;116:546-53.
5. Maguire D, Thorleifson M. Regional anesthesia catheter tunnelling: A simpler approach. Can J Anesth 2019;67:768-9.
6. Lin C, Reece-Nguyen T, Tsui B. A retrograde tunnelling technique for regional anesthesia catheters: how to avoid the skin bridge. Can J Anesth 2019;67:489-90.

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