

CASE REPORT

A Novel Technique of Epidural Catheter Fixation

¹Ruchi Singh, ²Mayank Chansoria, ³Amit K Choukse, ⁴Neha Vyas

ABSTRACT

We report a case of 45 years old female posted for cholecystectomy for gall bladder stone under combined epidural and general anesthesia. Epidural catheter was inserted at T9 to T10 and fixed by subcutaneous tunneling followed by suturing and looping. An insignificant dislodgement of 2 mm was observed with a good postoperative analgesia and patient satisfaction score with only mild signs of inflammation after 3 days.

Keywords: Dislodgement, Epidural catheter, Fixation, Technique.

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INTRODUCTION

Epidural analgesia has been the backbone of postoperative analgesia. However, an epidural catheter correctly placed has all the chances of dislodgement if it is not fixed properly. There are many techniques available for fixing the epidural catheter; however, here we report an innovative way to fix epidural catheter.

CASE REPORT

A healthy 45-year-old woman of 58 kg was scheduled for cholecystectomy for gallbladder stone under combined epidural and general anesthesia. Before induction of anesthesia, an 18 gauge Tuohy needle was used to identify the epidural space in the midline at T9 to T10. A loss of resistance to air technique was used with the patient in the sitting position and 3.5 cm of a closed tip multiorifice catheter was placed in the epidural space. No blood or other fluid was aspirated, and a test dose of 3 ml of 1.5% lidocaine with 1:200,000 epinephrine produced no suggestion of catheter misplacement.

After proper skin filtration with 2% lignocaine, the Tuohy needle was used to create a subcutaneous tunnel (2.5 cm long) along the paramedian groove (Figs 1 and 2). The distal end of the catheter was fed into the bevel of the Tuohy needle and was pulled through the subcutaneous tunnel. The needle was removed, and then after making a small loop of the catheter, after its exit from the tunnel, it was directed over the right shoulder the catheter was then sutured to the skin using a synthetic, monofilament, nonabsorbable polyester suture at its exit site from the tunnel, taking sufficient precaution as to avoid damage or kinking in the EC by the suture (Fig. 3). Adhesive tape was applied, leaving the puncture site uncovered, followed by further usage of sterile gauge pieces and adhesive tape to secure the catheter at its exit site from the skin.

Surgery was uneventful after induction of general anesthesia with propofol and maintenance with a nitrous oxide/oxygen/isoflurane sequence. During the case 15 ml of 0.25% bupivacaine containing 5 pg/ml fentanyl was administered through the epidural catheter with no adverse outcome.

The distance between epidural tip and skin surface was recorded as 8 cm in the patient, at the time of insertion. The distance between catheter tip and the skin was recorded a second time at the time of catheter removal (8.2 cm) and was compared to the preoperative value directly after catheter insertion (8 cm). Absolute values for catheter length were determined in millimeters using a ruler. Significant outward movement was defined as >2.5 cm from the position at insertion. For inwards movement >1 cm was defined as significant



Fig. 1: Local infiltration at the site of tunneling

^{1,3}Postgraduate Resident, ²Assistant Professor
⁴Consultant Endodontist

¹⁻³Department of Anesthesiology, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh, India

⁴Department of Anesthesiology, Sukh Sagar Dental College Jabalpur, Madhya Pradesh, India

Corresponding Author: Ruchi Singh, Postgraduate Resident Department of Anesthesiology, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh, India, Phone: 9165291956 e-mail: instantruchi@gmail.com



Fig. 2: Subcutaneous tunneling



Fig. 3: Subcutaneous tunneling with suturing

(as per Burstal's definition of catheter dislodgement). No significant dislodgement was observed in this case.

Postoperative analgesia was assessed using visual analog scale (VAS) score on a scale of 10. Visual analog scale score was 2, every time when assessed on postoperative day 1, 2 and 3. Patient gave a satisfaction score of 3 (good), when assessed using notes from 1 (excellent) to 5 (insufficient).

Mild signs of inflammation were noted at the site of tunneling and suture. Only redness and swelling were observed in the above case. No pressure pain at catheter insertion, or tunneling site was noted. No antibiotics were required to be given for epidural catheter-related infections.

DISCUSSION

The suturing and tunneling with looping technique showed no significant dislodgement.

The rationale behind our study was that multiorifice epidural catheters we use have the most proximal orifice located 14 mm from catheter tip. If epidurals were inserted 30 mm a dislocation of 25 mm would consecutively lead

more or less to procedural failure, as most of the orifice bearing part of the catheter would be out of the epidural space. Thus, we chose to define outwards movement of >2.5 cm as significant, as described by Burstal et al.¹

Inward migration may lead to ascending levels of blockade as reported by Mourisse et al.³ Inward migration of the epidural catheter has been reported with intravascular,⁴ subdural,⁵ or subarachnoid injection on repeat doses. So, a stringent definition for clinically significant movement, usually 1 cm has been suggested. However in this case, only outward migration was seen.

Bishton et al⁵ and Burstal et al¹ observed that epidural catheters were more likely to move outwards than inwards. The epidural catheter in the above case also showed an insignificant dislodgement of 2 mm in the outward direction.

Bougher et al⁶ in their study on determining the effect of tunneling on epidural catheter migration, found that 13% of catheters migrated inward by 1 cm or more and 35% migrated outwards by 1 cm or more.⁶

Tripathi and Pandey,² found a higher incidence of inward migration of epidural catheters in patients with subcutaneous tunneling. They had left a small loop between the puncture site and tunnel entry of the catheter, and this may have allowed easy inward catheter movement. In the present case thus, the loop has been placed after the subcutaneous tunnel and hence, the observed reduction in inward migration.

The goal of making loop in all the techniques is to dampen any drag on the catheter thus, protecting the part of the catheter leaving the tunnel and the epidural space itself. Furthermore, being flat on the back of the patient, looping is very acceptable to patients when lying flat.

Sellmann et al used suturing and tunneling for epidural catheter fixation with an overall reduction in the rate of dislodgement.⁷ We have combined looping as well with the suturing and tunneling technique in the present case.

Tunneling and suture of epidurals may lead to local inflammatory reactions of the skin restricting a more prolonged use.

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