UNSUSPECTED EXTRADURAL CATHETERIZATION IN AN INTERSCALENE BLOCK

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SUMMARY

A case report is described of a patient in whom a catheter was inserted inadvertently into the cervical extradural space in performing an interscalene brachial plexus block.

KEY WORDS

Anaesthetic techniques, regional: interscalene brachial plexus block Complications: extradural catheterization

CASE REPORT

A 58-yr-old woman had a displaced fracture of her left radius. She developed a sympathetic dystrophy of the hand, with swollen, red tender fingers and secondary wasting of the forearm and hand muscles. She was admitted for intensive physiotherapy in an attempt to restore movement to her wrist and hand. However, this was difficult because of the intense pain when her hand was touched.

Several methods were attempted to provide analgesia for physiotherapy. Stellate ganglion blocks were not tolerated, as the patient found them to cause "excruciating" pain. A catheter inserted into the brachial plexus by the axillary route became dislodged. Daily “single shot” axillary blocks were successful, but the axilla became bruised and tender. A single shot interscalene block resulted in the ulnar distribution remaining unblocked, although the patient tolerated physiotherapy well. It was decided to insert a tunneled interscalene catheter for a further 1 week of physiotherapy.

A 17-gauge over-the-needle cannula was used, as this was the smallest through which the 18-gauge catheter would pass. The interscalene space was entered perpendicularly at the level of the sixth cervical vertebra, as described by Winnie [1]. Paraesthesiae were elicited easily at a depth of 2 cm. The needle was withdrawn and the 18-gauge catheter inserted easily. In an attempt to position the tip in the lower part of the plexus, 12 cm was inserted. The proximal end was tunneled subcutaneously to the anterior chest.

A plain x-ray of the neck did not reveal the catheter, as it was not radio-opaque.

Ten millilitre of 0.25% bupivacaine was injected. Within 5 min, the patient was pain free. Only the left hand and forearm were blocked. Six hours later the block was wearing off, and a further 0.25% bupivacaine 10 ml produced the same effect, with some spread to the left upper arm. Passive physiotherapy was performed easily and the patient was mobile and participated in ward activities.

The patient and physiotherapist commented on the excellent analgesia obtained.

After another top-up dose (10 ml), the patient experienced transient warmth in her right shoulder and numbness of her left arm. The catheter was withdrawn 3 cm. The following day, another top-up (0.25% bupivacaine 10 ml) resulted in postural hypotension (arterial pressure 115/70 mmHg with the patient lying, 80/? standing) and numbness spreading from the left hand to the neck and right shoulder.

As this seemed likely to have been caused by extradural spread, radiographic examination was undertaken.

Radiography

In the x-ray department, 2 ml of the water soluble, non-ionic contrast medium iopamidol (Niopam 200, Merck) was injected through the catheter (fig. 1). The patient was placed supine, with one pillow. The contrast may be seen outlining the intervertebral foramen at the level of
T1 and the lower part of the plexus sheath, and the catheter may be seen entering the extradural space at the level of C6-7. The contrast was seen to move rapidly cephalad, outlining the whole cervical extradural space.

In a film taken 2 min later (fig. 2), the contrast may be seen mainly at the C2 level.

The catheter was withdrawn 6 cm. A repeat film, taken the following day (fig. 3) with 3 ml of contrast, shows the sheath filling. There was no leakage into the extradural space.

Subsequently 0.25% bupivacaine 10 ml produced a good block of the shoulder and arm except the ulnar distribution.

The catheter was left in situ for a further 5 days, and produced good analgesia, with no more problems. It was removed intact, and the patient has had no sequelae, although 4 months later her sympathetic dystrophy was still troublesome.

DISCUSSION

Extradural block following interscalene block is well described [2–5]. Common to these reports is rapid spread of the block to the contralateral side, within 10–20 min. Most reports have described the use of large volumes (30–40 ml) of local anaesthetic, usually lignocaine.

In this case, the initial block was satisfactory and unilateral, but withdrawing the catheter produced a bilateral block. It seems likely that, during insertion, the catheter entered the extradural space at C6-7, and exited at C7-T1, re-entering the plexus sheath. This would explain the initial unilateral blocks. Withdrawal by 3 cm left the catheter tip in the intervertebral foramen (fig. 1), so local anaesthetic injected produced both a good block of the left arm, and a cervical extradural block.

Respiratory distress might be expected from a bilateral block including the roots of the phrenic nerve. In reports of bilateral block, this com-
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Fig. 3. Catheter withdrawn to correct position. The brachial sheath (S) is seen to fill, after injection of 3 ml of contrast medium. The catheter (C) is shown.

Application has been absent [2, 3], treated with oxygen [5], or required IPPV [4, 5]. Lombard [2] cited the absence of respiratory or cardiovascular depression as evidence that his patient's bilateral block was not caused by extradural spread.

There was no respiratory distress at any point in the present case, perhaps because of the small volume (10 ml) injected, and possibly the greater motor-sparing quality of bupivacaine. Hypotension occurred only when the patient stood, and therefore was detected only because she was ambulant.

In summary, this is a case where, despite extradural insertion of the catheter, a unilateral block was produced with no respiratory or cardiovascular signs of misplacement (until the patient stood erect).

In cannulation of the brachial plexus at this level, the direction of insertion of the catheter and the continuity with the cervical extradural space combine to make extradural insertion possible.

Either a radio-opaque catheter or fluoroscopy using a small volume of contrast medium may show correct (fig. 3) or ectopic (fig. 1) placement. Clinical results of injection of small volumes of local anaesthetic are an unreliable guide to correct placement, although the use of small doses should limit any effects.

REFERENCES