

Trial Peripheral Nerve Stimulation via Stimulating Epidural Catheter for Neuropathic Pain

M.H. ATHER, T. GOROSZENIUK, K. SANDERSON
Guy's & St. Thomas' Hospitals, London

Neuromodulation is a valuable tool in managing many chronic intractable conditions and has been effectively used in a number of chronic pain syndromes. Pain limited to a particular peripheral nerve is likely to respond to peripheral nerve stimulation (PNS). In PNS, electrodes are implanted at the level of the peripheral nerve itself by open surgical exposure. We describe use of percutaneous stimulating epidural catheter as temporary PNS for the treatment of neuropathic pain and trial for permanent PNS.

Patient A, 59 years ex-war veteran, suffered from accidental injuries to right ulnar nerve on three different occasions, last being nine years ago, resulting in constant burning pain and anaesthesia on medial aspect of forearm with impaired hand grip and muscle power of hand. A diagnosis of Complex Regional Pain Syndrome type 2 was made. He received course of intravenous regional guanethidine blocks and stellate ganglion blocks combined with intense physiotherapy and oral medications including opioids without any benefit. A continuous infusion of local anaesthetic in the vicinity of ulnar nerve gave him some relief. Patient B, 36-year-old lady suffered from accidental trauma to right little finger six years ago. Surgery was performed to repair the extensor tendon. It was noted at the time of operation that small branches of ulnar nerve have been served. Post-operatively she complained of persistent pain, developed blue discolouration and sweaty palm, weak grip, flexion deformity of little finger with moveable but painful proximal interphalangeal joint. A diagnosis of Complex Regional Pain Syndrome type 1 was made. A surgical splint was applied to proximal interphalangeal joint. Various treatment modalities tried, over last five years, included course of ring blocks, intravenous regional guanethidine blocks and stellate ganglion blocks combined with intense physiotherapy, acupuncture, transcutaneous electrical nerve stimulation and oral medication.

In both patients, under aseptic conditions, ulnar nerve was located with stimplex needle by stimulating at > 0.5 mA. A stimulating epidural

catheter (Stim-Kath, Epimed) was inserted, through 14 G intravenous sheath along the course of ulnar nerve in upper arm, end of catheter being above the medial epicondyle. A trial stimulating unit was connected to the proximal end of catheter via alligator clips, with the negative lead connected to catheter wire and the positive electrode grounded to patient. Good paraesthesia was achieved in cutaneous painful areas in both patients. The catheter was sutured to skin. Initial dose of prophylactic antibiotics was given. Patients were instructed about adjusting the pulse and amplitude of the trial transmitter unit. In patient B blue colour of palm turned to pink coloration immediately. At follow-up visits for five and three months in patient A and B respectively, excellent pain relief was reported with restoration of functions, without any complication. Both patients are currently on no medication and highly satisfied.

Although PNS have been used since 1967, the exact mechanism of their action has yet to be elucidated. Pain in the distribution of a single traumatised peripheral nerve constitutes the best indication for peripheral nerve stimulation. Pain reduction with a trial of transcutaneous electrical nerve stimulation or with local anaesthetic nerve block has been advocated as a screening procedure for PNS. However the favourable response to these tests does not correlate to the outcome of PNS. Open surgical implant of a paddle-type electrode is commonly used as trial and first stage of permanent implant but is expensive and needs expertise. Percutaneous technique using epidural stimulating catheter, as described above, can demonstrate the effectiveness of PNS as short-term treatment or for trial purpose. The procedure itself is simple, reliable in producing paraesthesia and efficacious in evaluating pain relief, drug usage, functional restoration and can be used for extended period with minimal risks and high patient satisfaction. The electrode is relatively inexpensive. We, therefore, believe that this technique may be used as cost-effective and reliable method for trial prior to permanent implant of PNS and for short-term treatment of neuropathic pain limited to one nerve.

References

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