

Ultrasound guided percutaneous electro-coagulation of ilioinguinal and iliohypogastric nerves for treatment of chronic groin pain

INTRODUCTION

Chronic groin pain or inguinodynia is common following surgery of inguinal hernia, incidence of which can be as high as 43.3%.^[1] The diagnosis is based on history and diagnostic nerve blocks. The treatment options vary from oral analgesics, nerve blocks or neurolysis to surgical exploration and mesectomy (with or without neurectomy) or triple neurectomy only.^[2,3]

CASE REPORT

A 60-year-old male patient was referred from general surgery department for assessment and management of right chronic groin pain. This patient had undergone right inguinal open meshplasty with preservation of ilioinguinal (II), iliohypogastric (IH) and genital nerves 6 months back for reducible right inguinal hernia of 10 months duration. The patient gave no history of right chronic groin pain or any other chronic pain before surgery. He developed chronic groin pain around the incision site, at the root of penis, upper medial part of right thigh and part of right scrotum for past 2½ months for which he was taking analgesics without satisfactory relief. Pain was of burning and pricking character, which was aggravated by walking and sitting. It was interfering with his daily and employment activities. There was no pain at the time of sexual intercourse and ejaculation. Tapping the skin medial to the right anterior superior iliac spine (ASIS) and over areas of local tenderness produced pain (Tinel's test positive).

History and examination were suggestive of neuropathic pain (VAS 7/10) in the territory of II and IH nerves. The plan was to do a diagnostic nerve block with lignocaine followed by chemical neurolysis under ultrasound guidance. The II and IH nerves were identified by ultrasound (Micro MAXX®, Sonosite) with high frequency linear array probe (HFL38/13-6 MHz) in resolution mode, medial and above right ASIS. With the help of colour Doppler, ascending branch of deep circumflex iliac artery was identified to avoid

mistaking it for nerve. The diagnostic block was carried out with 2 mL lignocaine 1% for each nerve. Patient had complete pain relief at rest and with activities, confirming it to be neuropathic. Following day chemical neurolysis of both nerves was carried out with ethyl alcohol (1 mL for each nerve) in two target areas (one just medial to ASIS and other one above ASIS) to ensure success of the intervention.

Patient was reviewed after 4 weeks. Patient had absolute pain relief for one week and only 25% pain thereafter. Pain was still affecting patient's daily activities so diagnostic nerve block was performed again which completely relieved the pain. After discussion with surgeons, patient was told about next option of surgical neurectomy. Another less invasive, percutaneous electrocoagulation of both nerves with the possibility of recurrence of pain was also explained for which patient agreed and gave informed consent. Electrocoagulation of both nerves was planned with 3 Fr Bugbee flexible monopolar cautery electrode (Karl Storz, [Figure 1]). Before performing the procedure on this patient, simulation was done on animal model to study appearance of the electrode tip under ultrasound and energy to be used for electrocoagulation. It was possible to place electrode tip over targets after passing it through epidural needle. The energy of different intensities was applied (10, 15 and 20 W) for one second in fulguration mode to three different targets and coagulation zones were studied. 15 W was found suitable for this procedure. Ultrasound guided electrocoagulation of both nerves was done under spinal anaesthesia [Figure 2]. This procedure was carried out for both nerves in similar two targets to ensure success of the intervention. Patient was given analgesics for 3 days and tablet carbamazepine 100 mg 8th hourly for one week. Four months after procedure, patient had loss of sensation to touch, cold and pain in areas supplied by II and IH nerves. There was effective relief of pain and improvement in quality-of-life.

DISCUSSION

Chronic groin pain is an underreported problem and only 1% patients are referred for further management.^[4] Incidence of debilitating chronic groin pain, which can severely restrict patient's daily activities and affect employment ranges from 0.5% to 6% following any form of laparoscopic or open repairs.^[1]

Neuropathic, non-neuropathic, visceral and somatic theories have been proposed, but exact aetiology

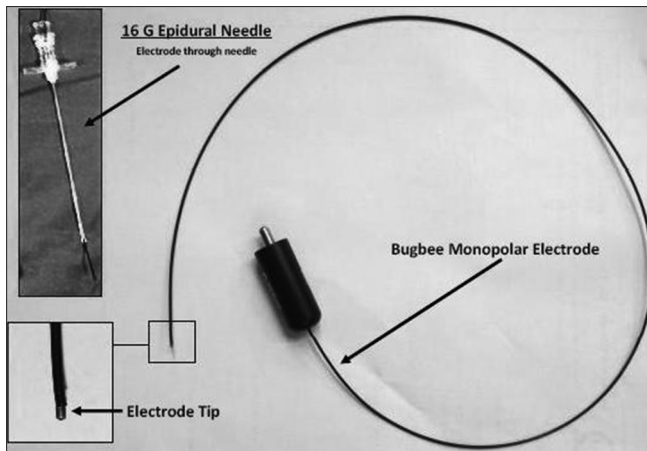


Figure 1: 3 Fr bugbee monopolar cautery electrode; electrode through 16 G epidural needle; only 1 mm of the electrode tip is exposed and the rest of it covered with insulating sheath

of inguinodynia is not known. Neuropathic pain can be because of II, IH and genital branch of genito-femoral and rarely lateral femoral cutaneous nerves involvement. Pain, burning, stabbing, shooting, pricking, reduced or increased sensation in the region of sensory distribution of involved nerve are suggestive of neuropathic pain and it may radiate to the hemiscrotum, upper leg and back. It is characterised by the presence of a trigger point, its episodic nature and by being aggravated by walking or sitting. The neuropathic pain can be reproduced in the sensory innervations of the affected nerve by tapping the skin medial to the ASIS or over an area of local tenderness (Tinel's test). A constant dull-ache over the entire groin area with no specific trigger point is suggestive of non-neuropathic pain, which is usually aggravated by strenuous exercise.^[2] Patient reported above had symptoms and signs suggestive of neuropathic pain.

Life-style modification, physical and psychological treatment are not effective options. Nerve blocks can be diagnostic and/or therapeutic. The positive diagnostic block helps in guiding therapeutic nerve blocks, neurolysis, neuro-destructive procedures and surgery. Surgical treatment is considered when pain persists after treatment with oral analgesics and/or local nerve (s) blocks.^[2] International guideline indicate triple neurectomy (ilioinguinal, iliohypogastric and genital branch of genito-femoral nerves) by experienced hands following failure of medical treatment for more than 1 year after surgery and chronic groin pain affecting normal daily activities of patient.^[1] Meshectomy (with or without neurectomy) in these patients has been shown to improve symptoms and patient satisfaction with acceptable recurrence rate and morbidity.^[3]

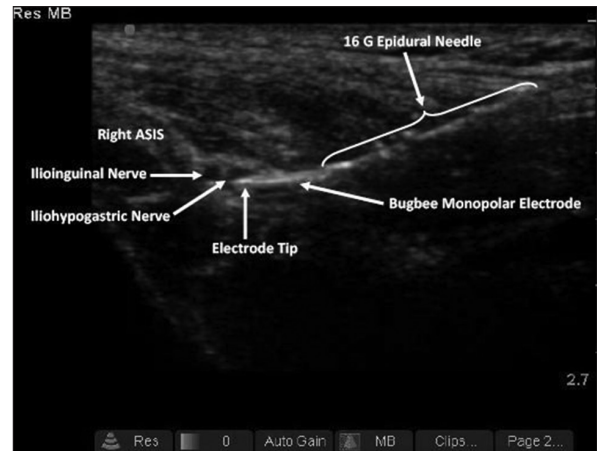


Figure 2: Ultrasound image showing hyperechoic electrode tip over nerve and epidural needle, placed by in-plane approach; epidural needle withdrawn away from nerve for clear vision of electrode tip

Long acting local anaesthetics, steroids and glycerol as well as neurolytic solutions such as alcohol or phenol have been used for therapeutic nerve block.^[2] Neuro-destructive procedures like cryo-ablation (-40°C) and thermo-coagulation with high temperature by radiofrequency waves have been shown to produce temporary pain relief in inguinodynia.^[5-7] Neuro-destructive procedures on gasserian ganglion by electro-coagulation, thermo-coagulation and Gamma Knife stereotactic radiosurgery have been successfully used under computed tomography guidance to treat chronic pain associated with trigeminal neuralgia.^[8] In one study electro-coagulation of gasserian ganglion has shown that 80% of patients had a recurrence of pain, but 96.7% attained complete pain relief after repeat electro-coagulation. The average follow-up period in this study was 12.7 years and the maximum was 33 years.^[9] Based on success of electro-coagulation of gasserian ganglion and simulation on animal model this case was managed.

CONCLUSION

The ultrasound guided percutaneous electro-coagulation of IIN and IHN can be a useful therapeutic option for chronic groin pain.

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REFERENCES

1. Alfieri S, Amid PK, Campanelli G, Izard G, Kehlet H, Wijsmuller AR, *et al.* International guidelines for prevention and management of post-operative chronic pain following inguinal hernia surgery. *Hernia* 2011;15:239-49.
2. Hakeem A, Shanmugam V. Current trends in the diagnosis and management of post-herniorraphy chronic groin pain. *World J Gastrointest Surg* 2011;3:73-81.
3. Koopmann MC, Yamane BH, Starling JR. Long-term follow-up after meshectomy with acellular human dermis repair for postherniorrhaphy inguinodynia. *Arch Surg* 2011;146:427-31.
4. Hindmarsh AC, Cheong E, Lewis MP, Rhodes M. Attendance at a pain clinic with severe chronic pain after open and laparoscopic inguinal hernia repairs. *Br J Surg* 2003;90:1152-4.
5. Fanelli RD, DiSiena MR, Lui FY, Gersin KS. Cryoanalgesic ablation for the treatment of chronic postherniorrhaphy neuropathic pain. *Surg Endosc* 2003;17:196-200.
6. Rozen D, Ahn J. Pulsed radiofrequency for the treatment of ilioinguinal neuralgia after inguinal herniorrhaphy. *Mt Sinai J Med* 2006;73:716-8.
7. Kastler A, Aubry S, Piccand V, Hadjidekov G, Tiberghien F, Kastler B. Radiofrequency neurolysis versus local nerve infiltration in 42 patients with refractory chronic inguinal neuralgia. *Pain Physician* 2012;15:237-44.
8. Kondziolka D, Zorro O, Lobato-Polo J, Kano H, Flannery TJ, Flickinger JC, *et al.* Gamma Knife stereotactic radiosurgery for idiopathic trigeminal neuralgia. *J Neurosurg* 2010;112:758-65.
9. Menzel J, Piotrowski W, Penzholz H. Long-term results of Gasserian ganglion electrocoagulation. *J Neurosurg* 1975;42:140-3.

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