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Case Report

Laparoscopic triple neurectomy as a treatment for chronic postoperative inguinal pain: a case report

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ABSTRACT

Background: Chronic postoperative inguinal pain is a potential complication following lower abdominal wall surgeries, particularly hernia repairs. When the pain is neuropathic and refractory to conservative treatment, surgical neurectomy may offer definitive relief. We report the case of a 56-years-old woman with severe right inguinal pain persisting six years after open inguinal hernia repair. The pain was burning in nature, radiated to the pubic region and significantly limited her daily activities. Clinical examination and dermatomal mapping confirmed involvement of the iliohypogastric, ilioinguinal and genitofemoral nerves. After conservative therapy failed, a laparoscopic triple neurectomy was performed through a transabdominal approach. Postoperative recovery was favorable, with progressive symptom relief and complete pain resolution (VAS 0/10) at two months. Laparoscopic triple neurectomy can be an effective and minimally invasive option for patients with chronic neuropathic inguinal pain unresponsive to medical management. Accurate diagnosis and patient selection are key to achieving optimal outcomes.

Keywords: Chronic postoperative inguinal pain, Hernia repair complications, Laparoscopic neurectomy, Neuropathic pain, Triple neurectomy

INTRODUCTION

Chronic neuropathic inguinal pain is a potential complication following lower abdominal wall surgeries such as inguinal hernia repairs, cesarean sections, appendectomies or even pelvic trauma.[1] Although its reported incidence varies, the resulting functional impairment and reduced quality of life pose significant concerns. Nerve involvement can occur due to direct intraoperative injury or secondary entrapment during the healing process.

Clinically, patients often report a burning sensation over the surgical scar, radiating toward the thigh or pubic region, commonly accompanied by sensory disturbances such as dysesthesia, hyperesthesia or hypoesthesia within the affected nerve's dermatome.[1,2] Chronic groin pain is defined as pain persisting for more than three months after the surgical intervention. Reports of its incidence in the literature are highly variable (ranging from 0.7% to 43.3%), largely due to differences in the definition of chronic pain, timing of assessment and measurement methods. However, the prevalence of debilitating pain that which interferes with normal daily activities or work is more consistently reported to range from 0.5% to 6%.[2,3]

Initial management is typically conservative, including local anesthetic or corticosteroid injections, opioids, tricyclic antidepressants, radiofrequency ablation and cognitive-behavioral therapy. When neuropathic pain is clearly diagnosed and refractory to conservative measures, surgical intervention may be considered as a definitive treatment.[2,3] Despite its potential benefits, evidence in the literature regarding laparoscopic neurectomy remains limited. This case report presents a

patient with chronic postoperative inguinal pain who achieved complete symptom resolution following a transabdominal laparoscopic triple neurectomy.

CASE REPORT

A 56-years-old female housewife with a history of systemic arterial hypertension controlled with Losartan 50 mg/day presented with chronic right inguinal pain. She had five uncomplicated vaginal deliveries. Seven years prior, she underwent an uneventful right inguinal hernioplasty using the Lichtenstein technique. Four years ago, she also had a laparoscopic cholecystectomy for chronic calculous cholecystitis.

She reported a six-year history of burning pain in the right inguinal region that progressively increased in intensity, significantly limiting her mobility and daily activities. Despite treatment by neurology and pain specialists with opioid analgesics and gabapentin, her symptoms showed only slight improvement and significant discomfort persisted after six months of therapy.

On physical examination, the patient appeared older than her chronological age and ambulated without major impairment; however, movement exacerbated pain in the right inguinal area. A well-healed surgical scar was observed without hernia recurrence. She demonstrated hyperesthesia in the right inguinal region extending to the anterior superior iliac spine.

Dermatomal mapping confirmed involvement of the iliohypogastric, ilioinguinal and genitofemoral nerve territories. Pain intensity was rated 9/10 on the visual analogue scale (VAS). Bilateral inguinal ultrasound and pelvic computed tomography showed no significant findings aside from fibrotic changes in the right inguinal region, consistent with prior surgery. The diagnosis of chronic postoperative neuropathic inguinal pain was made.

Given the failure of conservative management and the debilitating nature of her pain, laparoscopic triple neurectomy was planned. Under general anesthesia, the patient was positioned in the lateral decubitus position. Pneumoperitoneum was established via a right subcostal Veress needle and three trocars were placed: a 10 mm camera port lateral to the umbilicus and two 5 mm working ports along the mid-axillary line.

The peritoneum was incised longitudinally to access the retroperitoneal space. The quadratus lumborum muscle was identified and the iliohypogastric and ilioinguinal nerves (Figure 1) were dissected along the lateral border of the psoas muscle for approximately 3 cm each (Figure 2). A branch of the genitofemoral nerve was identified within the psoas and dissected similarly. All three nerves were resected in approximately 2 cm segments and sent for histopathological confirmation. Hemostasis was ensured; the peritoneum was closed with absorbable suture and the ports were removed and closed.

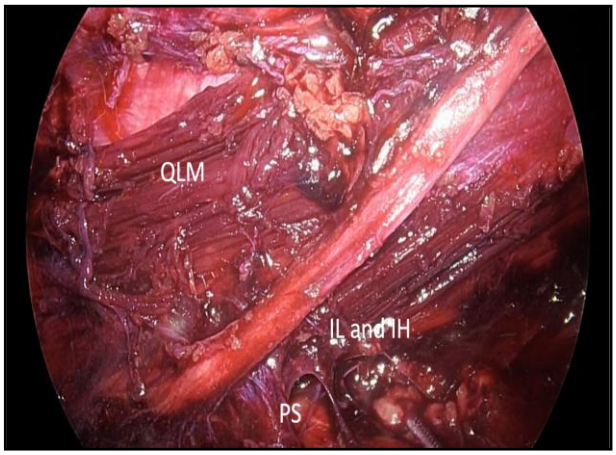

Figure 1: QLM (quadratus lumborum muscle), IL (ilioinguinal nerve), IH (iliohypogastric nerve), PS (psoas muscle).

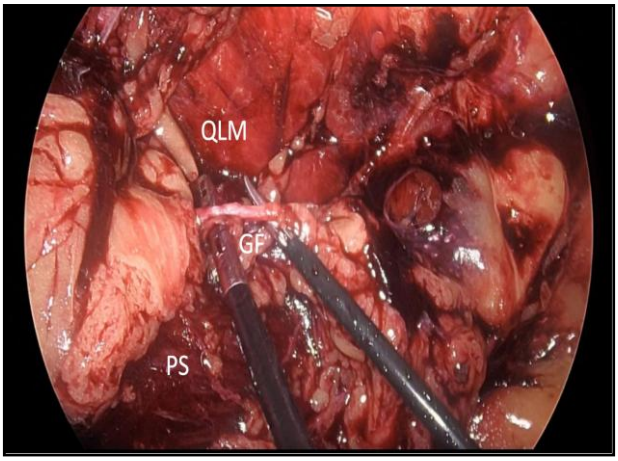

Figure 2: QLM (Quadratus lumborum muscle); GF(genitofemoral nerve); PS (Psoas muscle).

Postoperatively, the patient started a liquid diet immediately and resumed a normal diet after 8 hours. At 24 hours, her VAS pain score was 5. Neurological examination confirmed intact femoral and obturator nerve function. She was discharged with ketorolac, paracetamol and gabapentin. At 7 days post-op, VAS was 5. At one month, pain improved to 2/10, with partial return to daily activities and no hyperesthesia. At two months, she reported complete pain resolution (VAS 0/10) and full return to daily function, without complications such as infection or hematoma. She also reported significant improvement in quality of life.

DISCUSSION

Inguinal hernia repair is one of the most common surgical procedures worldwide, with approximately 20 million operations performed annually. However, despite

advances in tension-free techniques, postoperative inguinal pain remains a significant concern for surgeons, alongside hernia recurrence.[2] Chronic postoperative pain, in particular, continues to be frequently reported and can have severe consequences on patients' quality of life. The incidence of this complication varies widely depending on the surgical technique, evaluation methods and follow-up periods used, ranging from 0% to 76%.[2,3] It is estimated that between 10% and 15.3% of affected patients experience moderate to severe pain that limits their daily activities, as seen in the case we present.[4]

Chronic pain is defined as pain that persists between three and six months after surgery and can fluctuate in intensity.[5] This condition is a recognized complication following inguinal hernia repair and may manifest as neuropathic pain, nociceptive pain or a combination of both. Differentiating these etiologies is crucial for appropriate management. Neuropathic pain tends to predominate and is associated with the anatomical variability of the inguinal nerves, while nociceptive pain generally results from tissue inflammation, scar tissue or the presence of "meshomas".[6,7]

Clinically, neuropathic pain is characterized by sharp pain induced by activity, localized or radiating to the groin and inner thigh, often accompanied by paresthesia, hypoesthesia or hyperesthesia. This condition may arise from intraoperative or postoperative injury to the ilioinguinal, iliohypogastric and genitofemoral nerves.[8] Intraoperative causes include direct manipulation, thermal injury or entrapment by staples or sutures, while postoperative injury may result from nerve compression due to scar formation or meshomas.[8] Although neuropathic pain is estimated to affect about 50% of patients with chronic postoperative pain, the exact prevalence remains uncertain in current literature.[9]

Despite advances in knowledge and management, treating chronic inguinal pain remains challenging. The lack of consensus on the effectiveness of different therapies complicates interpretation and comparison of available results. Current recommendations are primarily based on case series and expert consensus, emphasizing the need for individualized approaches tailored to each patient's clinical characteristics and intraoperative findings.[6,7] Conservative treatment, including analgesics, topical therapies and non-pharmacological methods such as physical therapy and cognitive-behavioral therapy, constitutes first-line treatment except in cases of severe and disabling pain.[2-6]

The International Association for the Study of Pain recommends tricyclic antidepressants (such as amitriptyline), serotonin-norepinephrine reuptake inhibitors (venlafaxine) and voltage-gated calcium channel blockers (gabapentin, pregabalin) as initial pharmacological therapy.[10] It is considered reasonable to extend conservative treatment between 3 and 6 months, although some authors suggest prolonging it up to one year.[6,7] When this approach fails, surgery may be necessary, although not all patients with chronic postoperative pain are candidates for surgical denervation.

It is important to emphasize that pain is a subjective symptom for both the patient and surgeon, so avoiding biases and performing a thorough differential diagnosis is essential.[4] A detailed medical history, meticulous physical examination and complementary tests such as ultrasound, magnetic resonance imaging and neurophysiological studies are required.[7] Differentiating between neuropathic and nociceptive pain guides treatment. For neuropathic pain, diagnostic maneuvers such as dermatome mapping described by Álvarez et al and validated by Bjurström et al, allow high-sensitivity and specificity identification of the affected nerve, facilitating the decision between selective or triple neurectomy.[6,11,12] In our case, mapping showed involvement of all three nerves, justifying the performance of a triple neurectomy.

Surgical neurectomy is the treatment of choice for predominant neuropathic chronic postoperative pain, with favorable outcomes reported for both selective and triple neurectomy, performed via open or laparoscopic approaches.[13] Available series report pain relief rates ranging from 81% to 95%, with no significant differences between techniques.[13]

Although there are no robust comparative studies between open and laparoscopic neurectomy, the retroperitoneal endoscopic approach combines the benefits of minimally invasive surgery with the possibility of a more proximal nerve division, which may increase effectiveness.[6,7] The first report of laparoscopic neurectomy via the retroperitoneal approach was by Krähenbühl in 1997, with good results. Later, in 2013, Mahan attempted a transabdominal robotic-assisted approach for triple neurectomy, but it was Moreno-Egea who popularized this approach from 2014 onwards, highlighting it as a more natural route for general surgeons and reporting good outcomes in outpatient procedures.[14]

Another relevant surgical option is prosthetic material removal, especially in patients with nociceptive pain associated with "Meshomas." This procedure has demonstrated long-term safety and effectiveness and can be combined with neurectomies in cases of mixed pain or intraoperative evidence of nerve entrapment.[4]

Although morbidity associated with neurectomy is limited, specific risks vary according to the approach and nerves involved. The most common postoperative complication after anterior neurectomy is numbness, usually transient but unpredictable. In women, genital nerve denervation can cause numbness of the ipsilateral labia, affecting sexual function and resulting in loss of the cremasteric reflex.[7,8] Retroperitoneal posterior

neurectomy carries higher risks, including motor denervation of the oblique muscles, leading to bulging or eventration, as well as possible atrophy from subcostal nerve injury. Furthermore, proximal denervation at the L1 nerve root can produce a wider area of numbness and a higher risk of hypersensitivity due to deafferentation.[8]

CONCLUSION

Laparoscopic triple neurectomy is an effective minimally invasive option for the treatment of chronic postoperative inguinal pain refractory to conservative therapies. In the presented case, the surgical intervention resulted in significant pain reduction and satisfactory functional recovery, allowing the patient to resume daily activities with improved quality of life. Accurate diagnosis and appropriate patient selection are essential for optimal outcomes. Further research and long-term follow-up are needed to validate these findings and establish definitive clinical protocols.

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