

Chronic postsurgical pain after emergency cervical fusion with iliac crest graft - a multimodal approach to a multifactorial problem.

Case report

Dor crônica pós-operatória após artrodese cervical emergencial com enxerto de crista ilíaca - abordagem multimodal para um problema multifatorial. Relato de caso

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ABSTRACT

BACKGROUND AND OBJECTIVES: Chronic postsurgical pain is a major surgical complication with an impact on quality of life. Persistent pain following cervical fusion with iliac crest graft can be due to patient positioning, cervical surgical technique or nerve injury during iliac crest harvesting. Treatment options for chronic postsurgical pain overlap with those recommended for neuropathic pain. However, other pain mechanisms may be present in these patients.

CASE REPORT: Male patient, 51-year-old, with persistent pain five years after emergency cervical arthrodesis with an iliac crest graft. The patient was referred to the chronic pain department (CPD) for management of meralgia paresthetica. However, other significant pain etiologies were found and treated such as nociceptive neck pain, myofascial lumbar pain, and inguinal neuropathic postsurgical pain. The therapeutic approach included multimodal pharmacotherapy with anticonvulsants, antidepressants, weak opioids, topical capsaicin 8% patch, as well as nerve blocks. After almost two years of follow-up, CPD discharge was possible, with minimal pain and return to baseline activity.

CONCLUSION: Although the patient had a long course of undertreated postsurgical pain, a multimodal approach targeting different pain etiologies allowed the achievement of satisfactory pain control and return to baseline physical activity.

Keywords: Chronic pain, Combined modality therapy, Drug therapy, Nerve block, Pain, Postoperative block.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor crônica pós-operatória é uma importante complicação cirúrgica com impacto na qualidade de vida. A dor persistente após artrodese cervical pode ser secundária ao posicionamento do paciente, abordagem cirúrgica cervical ou lesão nervosa durante colheita de enxerto ilíaco. As opções terapêuticas para dor crônica pós-operatória têm alguma sobreposição com o tratamento da dor neuropática. No entanto, outros mecanismos de dor podem estar presentes nestes pacientes.

RELATO DO CASO: Paciente do sexo masculino, 51 anos, que se apresentou com dor persistente cinco anos após artrodese cervical emergencial, com enxerto de crista ilíaca. Foi encaminhado para a unidade de dor crônica (UDC) para abordagem de meralgia parestésica. No entanto, foram encontradas e tratadas outras etiologias de dor: dor cervical nociceptiva; dor lombar miofascial e dor neuropática pós-operatória inguinal. A abordagem terapêutica utilizada incluiu farmacoterapia com anticonvulsivantes, antidepressivos e opioides fracos, adesivo de capsaicina a 8% e bloqueios regionais. Após quase dois anos de seguimento, foi possível oferecer alta da UDC com queixas algícas mínimas e retorno da atividade física basal.

CONCLUSÃO: Apesar de o doente ter passado por um longo período sob tratamento insuficiente de dor pós-operatória, uma abordagem multimodal tendo como alvo diferentes etiologias de dor permitiu obter um controle algíco satisfatório e o retorno à atividade física basal.

Descritores: Dor crônica, Dor pós-operatória, Terapia combinada, Bloqueio nervoso, Tratamento farmacológico.

INTRODUCTION

Chronic pain (CP) is defined by the International Association for the Study Pain as pain that persists or recurs for longer than three months. It's one of the leading causes for seeking medical attention worldwide, with relevant impact on morbidity and quality of life¹⁻³.

Chronic postsurgical pain is a type of chronic pain that develops or increases in intensity after a surgical procedure¹. This is considered a major surgical complication that can impair rehabilitation and delay return to preoperative functional baseline. Prevalence is variable, but one year after a surgical procedure up to 30% of patients show some degree of postsurgical pain^{2,3}.

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Postsurgical pain after cervical fusion surgery may arise from patient positioning or surgical techniques. When iliac crest is harvested, persistent donor site pain may occur, usually due to nerve injury⁴.

Research has shown that postsurgical pain usually has neuropathic characteristics - paresthesia, hyperalgesia and/or allodynia. Therefore, many recommended approaches for postsurgical pain have been extrapolated from neuropathic pain management⁵.

Anticonvulsants, antidepressants, and topical lidocaine have been suggested as first line treatment options. Analgesics - paracetamol, non-steroidal anti-inflammatory drugs (NSAID) and weak opioids - are also used. Invasive therapeutic approaches such as neuromodulation, nerve blocks and ablations are usually reserved for patients with refractory pain^{5,6}.

Although postsurgical pain predominantly has neuropathic characteristics, other etiologies can coexist and may be overlooked. Therefore, thorough clinical interview and physical examination are essential for identifying specific etiologies and managing postsurgical pain⁵.

Furthermore, treatment can be hampered by long pain duration, as the complexity of pain pathophysiology increases over time with pain response amplification, nervous system remodeling and gene expression changes that can become permanent. Early and effective multimodal treatment strategies are paramount to avoid this possibly irreversible process and return patients to regular function levels⁷.

The present work reports the approach to a patient presenting with chronic postsurgical pain, through identification and management of a multifactorial condition. The objective was to explore the patient's clinical evolution since referral to the chronic pain department (CPD).

CASE REPORT

CARE guidelines (Case Report) have been used to prepare this manuscript to increase precision, transparency, and utility for the community^{8,9}. Written Free Informed Consent Term (FICT) was obtained from the patient for the publication of this case report and ethics committee approval was waived.

Male patient, 51-years-old, arrived at the CPD with several neck, lower-limb, and low back pain complaints.

These symptoms had started five years before the referral, when the patient - previously healthy and asymptomatic - sustained an 8-meter fall in a work-related accident, resulting in a C6 fracture with upper limb paraparesis. After the accident, an emergency cervical fusion with plate and right-side iliac crest bone graft was performed and, in the immediate postoperative period, the patient recovered from all previously stated neurological deficits.

After home-discharge, the patient had regular reassessment with his surgeon and reported having pain in the right anterolateral thigh and inguinal region, with neuropathic characteristics.

Treatment with NSAID and paracetamol (325 mg) associated with tramadol (37,5 mg) was initiated. Five years after the accident, due to sustained pain complaints, an electromyography was performed, which confirmed the diagnosis of meralgia pa-

resthetica. The patient was then referred to the CPD to treat this condition.

In the first CPD assessment, the patient stated several pain complaints that were persistent since the postoperative period: pain in the anterolateral thigh and inguinal region of the right lower limb measured by the Numerical Rating Scale (NRS=7), neck pain (NRS=4) and low back pain (NRS=5).

After physical examination, it was possible to better determine the characterization of the patient's pain. The following were identified: hyperalgesia and allodynia in the anterolateral thigh and inguinal region of the right lower limb and several trigger points in the right quadratus lumborum (QL) and erector spinae (ES).

From diagnosis workup, a spinal MRI was pointed out, which showed a lumbar hernia without compression or radiculopathy and no evidence of cervical pathology; as well as a right lower limb electromyography showing meralgia paresthetica.

The conclusion was that the patient had several postsurgical CP etiologies: meralgia paresthetica (which motivated the referral), nociceptive neck pain and myofascial lumbar pain.

Once the different mechanisms of pain were identified, a multimodal approach was initiated.

Oral drugs targeting different pain receptors were prescribed. The patient followed this scheme for 15 months: pregabalin 300 mg/day, duloxetine 60 mg/day, tramadol 200 mg/day; and paracetamol 325 mg + tramadol 37,5 mg fixed association as rescue therapy.

Meralgia paresthetica was directly targeted, performing an ultrasound-guided right lateral femoral cutaneous nerve (LFCN) block using perineural ropivacaine (0.2%) 10 mg and dexamethasone 4 mg.

Follow-up at four months after admission

On the first follow-up appointment, the patient stated mitigation of neck pain (NRS=0); persistence of low back pain (NRS=5); mitigation of anterolateral right thigh pain (NRS=0) but persistence of inguinal pain with allodynia and paresthesia (NRS=6).

To treat the persistent inguinal neuropathic pain, a capsaicin 8% patch was applied in the affected area. One month after this treatment, the patient stated mitigation of inguinal pain (NRS=0). However, an evaluation performed three months after treatment showed recurrence of pain (NRS=5, in average). Thus, a second session of capsaicin 8% patch was performed. Pain assessment three months after the second treatment showed mitigation of pain (NRS=0).

Follow up twelve months after admission

On the second follow-up appointment, the patient stated mitigation of neck pain, anterolateral right thigh, and inguinal pain (NRS=0), but persistence of myofascial lumbar pain (NRS=5).

To approach the patient's low back pain, ultrasound guided ES Plane and QL nerve blocks using ropivacaine (0.2%) 40 mg and dexamethasone 4 mg were performed.

On the last follow-up appointment (22 months after admission), the patient was found to have residual pain. He had restarted a regular physical activity plan for the first time since the surgery,

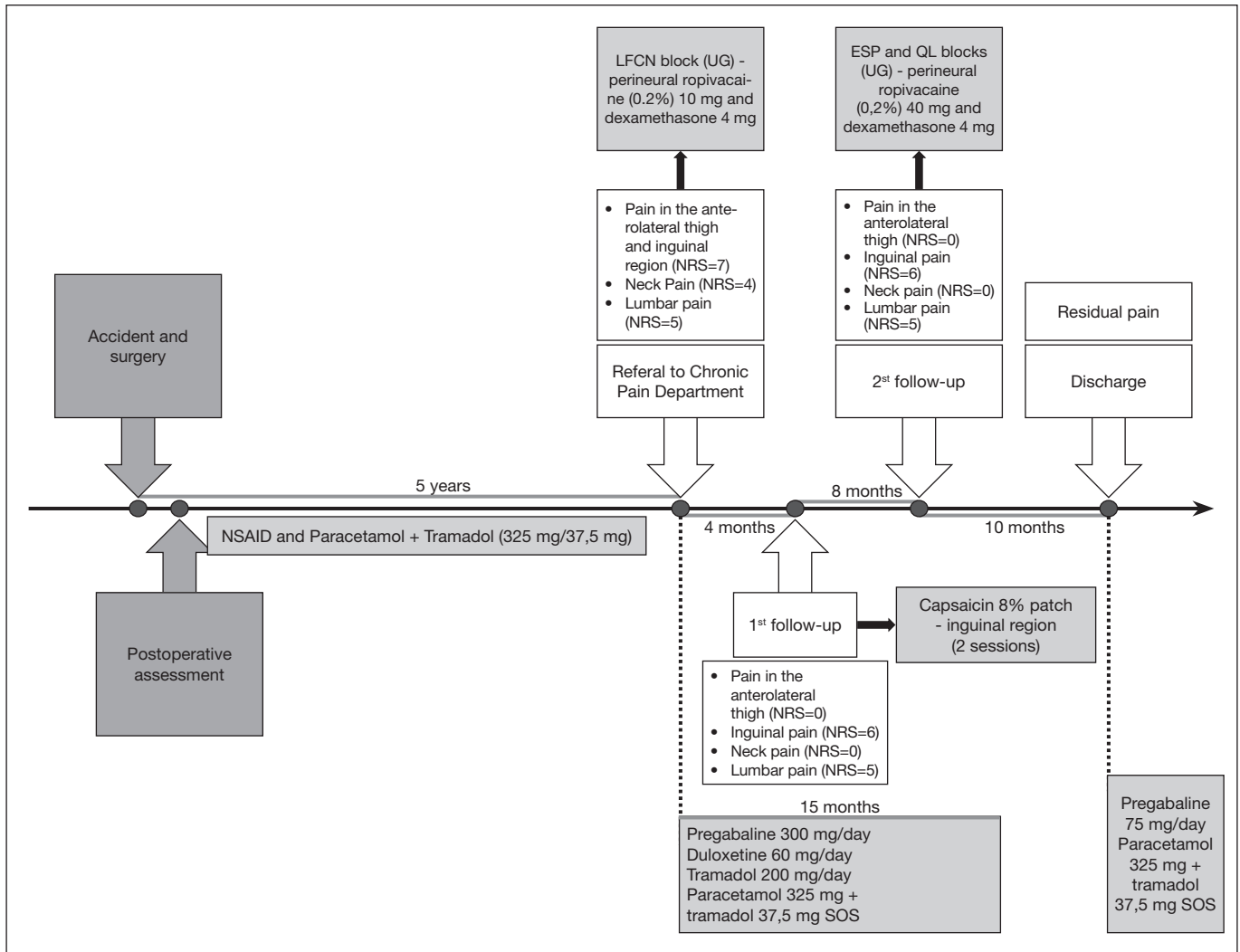


Figure 1. Case report timeline

NSAID = non-steroidal anti-inflammatory drugs; NRS = numerical rating scale; LFCN = lateral femoral cutaneous nerve; UG = ultrasound guided; ESP = Erector spinae plane; QL = Quadratus lumborum

with good tolerance. Optimized pain control allowed for a reduction in oral drug dosage: pregabaline 75 mg/day and paracetamol 325 mg plus tramadol 37.5 mg as rescue therapy. After almost two years of follow-up, CPD discharge was possible, with minimal pain and return to baseline activity. To this date, the patient had no recurrence of previous complaints.

DISCUSSION

The patient was suffering from chronic postsurgical pain which lasted for five years before the first contact with the CPD. Cervical and lumbar nociceptive pain and anterolateral right thigh neuropathic pain were identified.

The hypothesis was that a major component of the patient's CP was related to iliac crest harvesting. This surgical technique is still widely used for bone defects, although there are some alternatives - allografts, prosthesis material and growth factors - as autologous bone grafts show adequate mechanical and biological properties and do not have the potential infectious and immu-

nogenic risks of heterologous materials¹⁰. However, iliac crest harvesting may be complicated due to acute postoperative pain, vascular complications, and nerve damage – most often LFCN or ilioinguinal nerves¹¹. Lesion to these sensitive nerves can lead to neuropathic pain in their territories: lesion to LFCN leads to meralgia paresthetica - anterolateral thigh pain, paresthesia, and allodynia; lesion to ilioinguinal nerve leads to inguinal and upper thigh neuropathic pain. Treatment options are the same as for other neuropathic pain syndromes¹².

As part of a multimodal approach, oral pharmacotherapy targeting multiple pain receptors was initiated. An invasive procedure (ultrasound-guided nerve block) targeting the most intense and limiting pain injury - was performed: meralgia paresthetica due to documented LFCN. This technique mitigated the anterolateral thigh component of pain, which highlighted the persistence of inguinal pain in the first follow-up evaluation.

Because the persistent inguinal pain was in a limited and well-defined area, trial with capsaicin 8% patch was performed. This is an established treatment for neuropathic CP syndromes,

thought to act through p-substance depletion and nociceptive fiber induced dysfunction^{13,14}. In this case, two sessions of topical capsaicin were enough to achieve relief of inguinal neuropathic pain.

After 12 months of multimodal approach, cervical pain and right lower limb pain were mitigated. However, myofascial lumbar pain with several trigger points on the right QL and ES muscles persisted (NRS=5). Myofascial pain originates in the muscles and fascia due to trauma, physical inactivity or osteoarticular system lesions, presented alone or, more frequently, associated with other painful syndromes. Treatment options range from pharmacotherapy to intervention techniques¹⁵. The QL and ES Plane blocks were performed to target lumbar pain, and achieved pain mitigation.

This report presented a case of chronic postsurgical pain. Although this is a common surgical complication, consensus regarding effective perioperative prevention strategies has not yet been reached¹⁶. Regional anesthesia techniques seem to reduce the incidence of chronic postsurgical pain in some surgeries, but this is still inconclusive in iliac bone crest harvesting^{16,17}. Once chronic postsurgical pain has been established, it's not uncommon for it to be undertreated for some time, due to diagnosis and therapy limitations. Because that can have an impact in patient outcomes, authors stress the importance of a timely diagnosis and adequate timely treatment¹⁶.

The present case was particularly challenging due to the long course of postsurgical pain with inadequate treatment. In fact, the authors consider the long course of undertreated pain to be an important limitation to this patient's pain management. It's also important to note the limitation resulting from irregular periods of time between each pain reassessment, brought about by constraints regarding CPD appointments' scheduling.

The presence of multiple pain etiologies involved also added to the challenge of the case. The identification and individual targeting (with different technical approaches) of each pain etiology was a strength of this case management and allowed the achievement of pain control and return to functional baseline.

CONCLUSION

Chronic postsurgical pain is relatively common and can have a profound negative impact in patients' quality of life. This case report intends to raise awareness to this clinical situation, and to the fact that it is still often underdiagnosed. The identification and proper timely referral to appropriate treatment units is very important. The authors would also like to point out the impor-

tance of targeting different pain mechanisms, sometimes using several technical approaches, with the goal of improving patients' overall condition.

AUTHORS' CONTRIBUTIONS

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Research, Writing - Preparation of the original, Writing - Review and Editing

João Tiago Rodrigues

Research

Ana Barreira Martins

Research, Writing - Preparation of the original

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