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Clinical Case of Successful Lumbar Sympathectomy in the Treatment of Complex Regional Pain Syndrome

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ABSTRACT A 53-year-old male patient had extensive traumatic damage to the right lower limb in a car accident that happened 17 years ago, which subsequently led to a large amputation at the hip level. Later, adduction contracture in the right hip joint with a complex regional pain syndrome developed. Due to the ineffectiveness of various methods of conservative treatment, it was decided to perform right-sided lumbar sympathectomy. Ten days later, the patient was discharged for outpatient treatment. The result of the operation was a complete relief of pain syndrome both in the early postoperative and in the long-term periods of time. Despite the large number of types of conservative therapy in modern clinical practice, none of them is perfect. Doctors decide to operate less often, trying to minimize the intervention. However, therapeutic effects are not always possible as monotherapy, often requiring additional treatments. Due to the wide development and distribution of medical products, doctors often neglect or forget about such a method as lumbar sympathectomy. Therefore, the problem of complex regional pain syndrome remains relevant today.

Keywords: polytrauma, amputation, causalgia, complex regional pain syndrome, lumbar sympathectomy
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BP — blood pressure
CRPS — complex regional pain syndrome
ECG — electrocardiography
VAS — visual analogue scale

AIM OF STUDY

To illustrate the effectiveness of lumbar sympathectomy in the treatment of a patient with severe complex regional pain syndrome.

INTRODUCTION

Back in 1557, Ambroise Paré introduced the concept of "phantom pain", meaning pain in an amputated limb. Causalgia (*causalgia*; Greek *kausis* burning + *algos* pain; synonyms: Pirogov-Mitchell disease, causalgic syndrome) is an intense burning pain in the innervation zone of a partially damaged peripheral nerve containing a large number of sympathetic autonomic fibers. Causalgia was first described in 1855 by N.I. Pirogov, who observed a similar syndrome during the Crimean War of 1853-1856 and defined it as "traumatic hyperesthesia." The term "causalgia" appeared in 1872 in a book of the American physician V. Mitchell

and a group of co-authors who studied pain in the case of gunshot wounds to the extremities during the American Civil War. In 1988, the International Pain Association suggested to replace the term "causalgia" with a more precise definition, complex regional pain syndrome (CRPS) [1–4]. In 80–85% of cases, CRPS develops after injuries and surgical interventions on the limbs, but in 10–20% of cases, it is not possible to establish a connection between CRPS development and any cause [5–7]. This pathology is equally common after amputations for vascular diseases and traumatic injuries [8, 9].

Nowadays there are various complex multicomponent schemes of conservative treatment [10, 11]. As an alternative therapy when these methods are ineffective, a number of authors have recommended an operation, one of which is lumbar sympathectomy [12-14].

Description of the clinical case.

A 53-year-old male patient F. was treated at the Department of Vascular Surgery at the I.I. Dzhanelidze St. Petersburg Research Institute of Emergency Medicine in 2017. From the anamnesis it is known that on Aug 23, 2000 there was a car accident. The driver was taken to the University Hospital in Umeå (Sweden). The patient received the following injuries: traumatic amputation of the lower leg, left-sided acetabular fracture with complete posterior dislocation of the hip head, complete traumatic rupture of the symphysis, rupture of the right sacroiliac joint, and right-sided acetabular fracture without displacement. On August 26, 2000, he was transferred to the orthopedic clinic of the Uppsala Academic Hospital. On September 1, 2000, a revision of the right tibial wound was performed, as well as plate fixation for stabilization of the sacroiliac joint and symphysiolysis, open reduction with plate metal osteosynthesis of the left acetabular fracture. On September 2, 2000, due to failure of the measures taken to save the right knee joint associated with massive traumatic damage to soft tissues and the progression of the purulent-necrotic process, disarticulation was performed at the level of the knee joint. Subsequently, on September 12, 2000, the right lower limb was re-amputated at the level of the lower third of the thigh. The stump of the right femur healed by secondary intention. In the postoperative period, the patient noted constant severity and burning pain in the area of the right thigh stump. The pain was not relieved by taking narcotic analgesics, disturbed sleep. The diagnosis was established: closed traction injury of the trunks of the right lumbosacral plexus, syndrome of complete conduction disorder along the trunks of the right lumbosacral plexus. From 2000 to 2017, the patient complained of adductor contracture in the hip joint, complex regional pain syndrome (causalgia of the stump), and therefore the patient could not undergo rehabilitation measures and learn how to walk on a prosthesis. Subsequently, he was repeatedly treated in various neurosurgical, surgical, neurological private and city clinics in St. Petersburg, Moscow and Finland. He repeatedly underwent drug blockade, infusion and pill neurological therapy, physiotherapy, acupuncture, manual therapy with a weakly positive effect. In 2001, neurolysis of the trunks of the right lumbosacral plexus was diagnosed. In 2016, interlaminar epidural blockade was performed. In 2017, due to persisting pain syndrome, the stump was re-amputated at the level of the middle third of the right thigh. Despite the treatment, regional pain syndrome and phantom pain in the stump of the right thigh persisted. The patient continued to take non-steroidal anti-inflammatory drugs and antidepressants continuously.

On Dec 12, 2017, the patient was hospitalized in the department of vascular surgery of the I.I. Dzhanelidze St. Petersburg Research Institute of Emergency Medicine. Physical examination, pain assessment by visual analogue scale for pain (VAS), laboratory and instrumental research methods (ultrasound duplex scanning of the vessels of the lower extremities, electrocardiography (ECG), chest X-ray) were performed. There were no significant disorders in organs and systems. The right lower limb was of normal color, warm. Active movement and sensitivity were preserved. There were transient spasms in the stump. The VAS results: from 6 points in the period of well-being to 7 in the period of acute disease, were regarded as severe pain. Laboratory analyzes without significant deviations. The results of duplex angioscanning revealed occlusion of the superficial femoral artery on the right. There were no signs of limb ischemia. ECG: sinus tachycardia, 96 beats per min. There were no deviations of the electrical axis of the heart. Incomplete right bundle branch block. Moderate repolarization disorders in the apex and lateral wall. Considering the absence of a positive effect from the previous surgical treatment and the persisting intense pain syndrome in the course of conservative treatment, the patient was offered an operation: lumbar sympathectomy on the side of the affected limb. The patient agreed. On December 14, 2017, under general anesthesia in the position on the left side with a roller in the right lateral region of the abdomen, right-sided transverse lumbotomy was performed 2 cm lateral to the navel. With technical difficulties (incision in the area of the scar), the muscle layers were separated in a blunt and sharp way, an entrance was made into the right retroperitoneal space. The area of the lumbar spine and the right sympathetic trunk are highlighted. The lumbar trunk had a loose character. Lumbar ganglia L3 and L4 were removed. Control for hemostasis and the presence of foreign bodies. Layer-by-layer wound closure (Fig. 1).

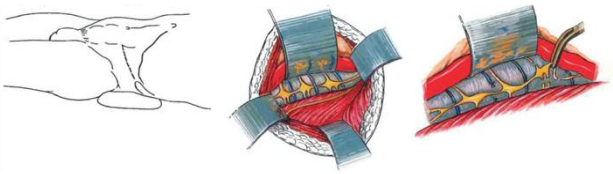

Fig. 1. The technique of lumbar sympathectomy

One hour later, the patient was transferred from the intensive care unit to the department. Activation on the 2nd day after surgery. The patient wore an abdominal postoperative band. The early postoperative period was uneventful. On the 10th day, the stitches were removed. The wound healed by primary intention without signs of inflammation. Pain syndrome in the extremity was arrested. Minor paresthesia persisted in the distal stump. The patient noted a significant improvement in overall well-being and the absence of pain both at rest and during physical activity. VAS score: 1, mild pain. A stable positive effect according to the results of control examinations was noted after 6, 12 months and 1.5 years (Fig. 2).

Improvement of well-being, absence of pain syndrome is noted, the patient masters walking on a prosthesis.

CONCLUSION

Today, there is no single approach to the treatment of chronic pain in diseases of the peripheral nervous system, and the abundance of therapeutic and surgical methods often puts practitioners in a difficult position when choosing the necessary tactics. Pain can have a devastating effect on patients' quality of life. Complex regional pain syndrome is a condition of persistent and often crippling pain that affects one area and often occurs after trauma, which severity does not correlate with the level of pain. Despite the fact that the history of the description of this syndrome is more than 460 years old, the mechanism of its occurrence, pathophysiology and diagnostics are not fully understood. Unsurprisingly, treatment for this condition is limited in effectiveness and capacity. Currently, with this pathology, surgical intervention is used less and less. Lumbar sympathectomy is an often forgotten treatment of choice for late amputation femoral stump pain. The operation can be recommended for use both after amputation for vascular diseases and traumatic injuries. As practice shows, this operation helps to reduce or completely arrest phantom pain.

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