

Foreign Body Epidural Granuloma in a Patient with Intrathecal Pump: Case Report and Literature Discussion

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1. Abstract

We report a case of an 82-year-old woman admitted in our department with a diagnosis of pertrochanteric fracture of the left femur and Colles fracture of the left wrist. The patient was carrier of an intrathecal pump with silicone catheter implanted 1 year before, for chronic back pain caused by intervertebral disc herniation D7-D8. After the surgery for reduction and fixation of the femur fracture and the Colles fracture, the patient complained of intense lower limbs pain, right lower limb plegia and a severe left lower limb paresis. The dorso-lumbar MRI examination showed a solid tissue occupying the epidural space with corresponding right posterolateral spinal cord compression at D8-D9 level and D7-D8 expulsed hernia, with a severe meningo-medullary compression causing myelopathy extended from D7 to D10.

In consideration of the clinical and neuroradiological findings an urgent posterior D7-D9 decompressive laminectomy and the infusion implant removal were indicated. Intraoperatively a greyish colour and soft consistency lesion was noted at the catheter tip that was located in the epidural space, completely isolated, excised and sent for the histopathological examination, and the catheter was removed. We believe that our work, in agreement with those reported in the literature, suggest that the symptomatic treatment with intrathecal catheter is often a dangerous and animproper option in patients treatable with minimally demolitive surgery. In the case we presented, the patient should have probably been treated by surgical decompression as initial and definitive therapeutic choice.

2. Introduction

An intrathecal pump is a medical device used to deliver medications into the area surrounding the spinal cord (intrathecal space) to administer small doses of drugs directly to the Central Nervous System (CNS). A continuous subarachnoid infusion of med-

ications is necessary when therapies or surgical procedures have failed or when they are contraindicated [1] in cases of chronic noncancer pain with a strong neuropathic component [2], chronic cancer pain [3], not malignant nociceptive pain [4]. Drugs such as morphine, centrally acting muscle relaxants or analgesics may be administered directly through this device in the CNS, minimizing the side effects of drugs taken systemically [1]. The use of intrathecal infusion of medications is not without risks or complications (1) in addition to those related to the surgery required to implant the pump. In literature are described cases of displacement or disconnection of the catheter, epidural hemorrhage, headache, loss of cerebrospinal fluid, hematoma, infection, spinal cord compression and paresis, persistent pain at the site of implantation of the catheter or the pump, seroma at the site of subcutaneous implantation of the pump, catheter migration, which can cause changes in analgesic effect, allergic reaction or rejection of the implanted materials, mobilization of the pump with possible local skin erosion, formation of granuloma at the catheter tip [5]. We hereby report a case of foreign body epidural granuloma in a patient with intrathecal pump, implanted for chronic back pain from an intervertebral disc herniation D7-D8.

3. Case Report

An 82-year-old woman was admitted in our department with a diagnosis of pertrochanteric fracture of the left femur and Colles fracture of the left wrist. The patient was carrier of an intrathecal pump with silicone catheter implanted 1 year before, for chronic back pain caused by intervertebral disc herniation D7-D8 (Figure 1). The patient reported an improvement in dolorific symptoms following intrathecal morphine infusion of 3mg/die. Physical examination at the admission did not show any sensory or motor neurological deficit of the lower limbs or any sphincter deficiency. Furthermore it did not reveal any local complication at the site of

subcutaneous implantation of the infusion pump (left side). The patient underwent surgery for reduction and fixation of the femur fracture with intramedullary nail and of the Colles fracture of the left wrist with 2 Kirschner wires and immobilization. In the second post-operative day the patient complained of intense lower limbs pain. The neurological examination showed a right lower limb plegia and a severe left lower limb paresis (MRC grade 2 in flexion-extension of the foot), normopallesthesia costal arch, hypopallesthesia at the right ASIS, apallesthesia at the left ASIS, apallesthesia of the lower limbs, presence of bilateral pathological Babinski reflex, right lower limb osteotendinous hyperreflexia and tendency to triple flexion. The dorso-lumbar MRI examination showed a solid tissue occupying the epidural space with corresponding right posterolateral spinal cord compression and ipsilateral foraminal involvement at D8-D9 level, with irregular contrast enhancement of the lesion. Furthermore the MRI showed D7-D8 expulsed hernia, with a severe meningo-medullary compression causing myelopathy extended from D7 to D10 (Figure 2). In consideration of the clinical and neuroradiological findings an urgent

posterior D7-D9 decompressive laminectomy and the infusion implant removal were indicated.

Intraoperatively a greyish colour and soft consistency lesion was noted at the catheter tip that was located in the epidural space, so mobilized from the original intrathecal position of implantation. The lesion was completely isolated, excised and sent for the histopathological examination, and the catheter was removed (Figure 3).

The histology showed the presence of adipose and fibrohyalin tissue with dense chronic inflammatory lymphoplasmacellular infiltrates and granulomatous reaction with giant cells delimiting extensive areas of non-suppurative necrosis. The patient was discharged 10 days after surgery with a clinical picture characterized by complete recovery of lower left limb sensory and motor function, complete recovery of right lower limb sensitivity and persistence of the motor deficit of the Tibialis Anterior muscle (TA), Extensor Digitorum muscle (ED) and Extensor Hallucis Longus muscle (EHL). The clinical monitoring visit, performed 30 days after discharge, showed a complete recovery of right leg motor deficit.



Figure 1: Rmn that shows a disc herniation D7-D8

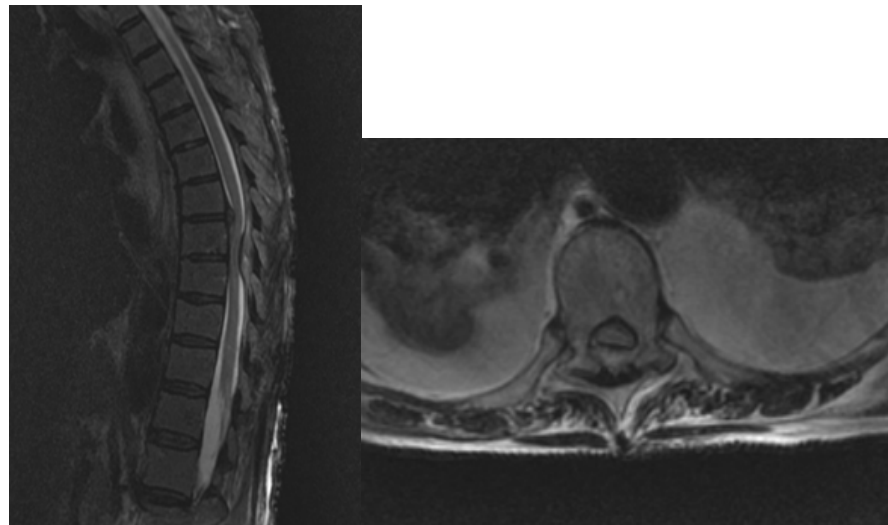


Figure 2: Rmn shows expulsed hernia with severe medullary compression

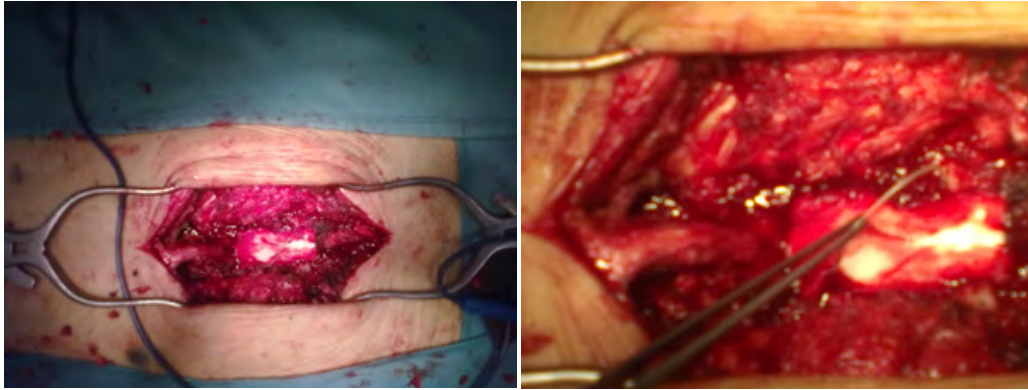


Figure 3: Intraoperative images that show the mobilization of the intrathecal pump with the tissue surrounding the catheter tip

4. Discussion

In literature are reported several cases of granuloma after implantation of intrathecal catheters. First of all we examined the mobilization of the catheter positioned initially in the sub arachnoid space. In the literature [6] are reported several cases of mobilization associated with reduced analgesic efficacy since the erroneous position of the catheter tip, no more into the subarachnoid space, makes the intrathecal infusion of the drug not possible anymore. There are different pathogenetic hypothesis regarding the formation of a granuloma, as widely demonstrated by numerous studies [7, 8, 5]. The first hypothesis correlates the infusion of morphine with the onset of granulomas. Many studies, including the ones of Bidlack et al. in 1990 and Magazine et al. in 1996, show that morphine can act as a mitogen, activating protein kinase cascade which is responsible for pro-inflammatory activity of white blood cells [5]. The study by Coffey RJ et al. 2002 has considered 41 cases of epidural catheter granuloma in patients treated with opioids for chronic pain [9] According to the authors the most plausible hypothesis about the genesis of granuloma is the high dose of opioid drugs or the use of drugs or admixtures that are not approved for intrathecal use. Other studies correlate the onset of granulomatous tissue reactions with the presence of infections developed in carriers of indwelling intrathecal catheters. Marion et al., reported the case of a subarachnoid granuloma, positive for coagulase-negative staphylococcus, developed eleven years after the implantation of an intrathecal catheter [10]. Numerous studies consider the development of granuloma as a tissue reaction to a foreign body. In the international literature is widely demonstrated that the introduction of an exogenous material may cause this reaction in body tissues. However, Du Pen et al. showed in their works that the material used for intrathecal catheters, the silicone, does not trigger granulomatous inflammatory reactions [11]. The study of Phillips et al. demonstrated that the tissue reaction stimulated by the silicone in vivo, is benign and it is inferior to the implantation of other materials [12]. The treatment of pain by intrathecal infusion of drugs is a valuable option in the treatment of patient with cancer- or non-cancer-related chronic pain and non-malignant nociceptive pain. In fact, those are complex patients for which it is not

always possible to propose etiological treatments, such as surgery. We believe that our work, in agreement with those reported in the literature, suggest that the symptomatic treatment with intrathecal catheter is not free of complications. Therefore, every indication for that therapy should be evaluated carefully. We believe, also considering the cases described by other authors, that the indication for the implantation of those pumps is often a dangerous and improper option in patients treatable with minimally demolitive surgery. In the case we presented, the patient should have probably been treated by surgical decompression as initial and definitive therapeutic choice.

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