

Spinal Analgesic Drug Delivery for Ehlers-Danlos Hypermobility Type Chronic Pain Treatment: A Case Report

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Abstract

Study background: Chronic pain in patients with Ehlers-Danlos hypermobility type can be a severe, debilitating disorder. Scientific literature on pain treatment in these patients is scarce. We present a case report on spinal analgesic drug delivery for diminishing pain.

Methods: Multidisciplinary consultation in adult female patient with Ehlers-Danlos, hypermobility type. Implanting Synchronomed® II pump (Medtronic, Minneapolis, MN, United States of America) after successful trial period. One year follow-up.

Results: During the trial period, verbal Numerical Rating Scale decreased from 8 to 3 with 0.72 mg of spinal morphine (2 mg/mL, 0.36 mL/day) and no oral or transdermal opioids. The spinal morphine/hydromorphone infusion schemes and verbal NRS for pain after implantation are presented. Baseline and follow-up results at one year from the other questionnaires are presented. Wound healing was successful.

Conclusion: Spinal analgesic drug delivery can be an option to treat chronic, widespread pain in patients with Ehlers-Danlos syndrome, hypermobility type. Multidisciplinary consultation is necessary to deal with the wide variety of problems in these patients.

Keywords: Ehlers-Danlos; Hypermobility type; Spinal analgesic drug delivery; Joint hypermobility syndrome; Spinal analgesia; Intrathecal analgesic drug delivery

Abbreviations: 4DSQ: Four Dimensional Symptom Questionnaire; CPAQ: Chronic Pain Acceptance Questionnaire; EDS: Ehlers-Danlos syndrome; HADS: Hospital Anxiety and Depression Scale; NRS: Numerical Rating Scale for pain; ODI: Oswestry Disability Index; PCI: Pain Coping Inventory; RAND-36: RAND 36 item health survey; TENS: Transcutaneous Electric Nerve Stimulation; TSK: Tampa Scale for Kinesiophobia

Introduction

A young, female patient (22 years, Caucasian, Body Mass Index 18.7) was referred by one of the neurologists to the pain center because of chronic, refractory lumboradicular pain, having had nucleoplasty two times at L4-L5 and one time at L5-S1, lumbar epidural infiltration, radiofrequent disc denervation at L4-L5 and transcutaneous electric nerve stimulation (TENS) in another hospital. Consultation of a psychologist as well as rehabilitation specialist had already been established, and treatment with anti-nociceptive (Paracetamol, Tramadol) medication had commenced. Genetic counselling, recommended by the rehabilitation specialist had revealed Ehlers-Danlos syndrome (EDS), hypermobility type. No further (genetic) investigations were performed at that moment.

During medical history she complained of wide spread pain (back pain above all), refractory to all offered treatment so far, as well as fatigue, wrenching and a decreased effect of local anaesthesia revealed at the age of 10. We decided to initiate oral (Gabapentine, ceased because of side effects) and transdermal (Buprenorphine, slightly effective but with side effects) medication, changing the regimen to oxycodone (moderately effective but with side effects) and fentanyl (moderately effective but with side effects). After extensive follow-up we decided to initiate the flowchart for spinal analgesic drug delivery (Figure 1), for which she gave informed consent. Special attention was paid to the issue of wound healing.

Materials and Methods

After multidisciplinary consultation and pre-operative screening (Figure 1), a trial period with spinal analgesic drug delivery was initiated, using an Ascenda® spinal catheter (model 8781, Medtronic, 710 Medtronic Parkway, Minneapolis, MN, United States of America), a port-a-cath system (Porthales® 4000M, Medtronic, 710 Medtronic Parkway, Minneapolis, MN, United States of America) and a Crono five ambulatory infusion pump (Intrapump® infusion systems, 920 Minters Chapel Rd, suite 200, Grapevine, TX, United States of America). Placement of the port-a-cath occurred at the site of pump implantation. An infusion regimen with morphine (Table 1) was started and oral medication was gradually decreased and stopped. After a successful three-week trial period the port-a-cath system was replaced by a Synchronomed® II programmable infusion pump (model 8637-40, Medtronic, 710 Medtronic Parkway, Minneapolis, MN, United States of America), using the same flow and concentration found during the trial period. During the implantation procedures special attention was paid to wound healing (e.g. approximation of the wound edges and using Steri-strip® surgical skin closure (3M, 3M Center, St. Paul, Maplewood, Minnesota, United States of America).

Results

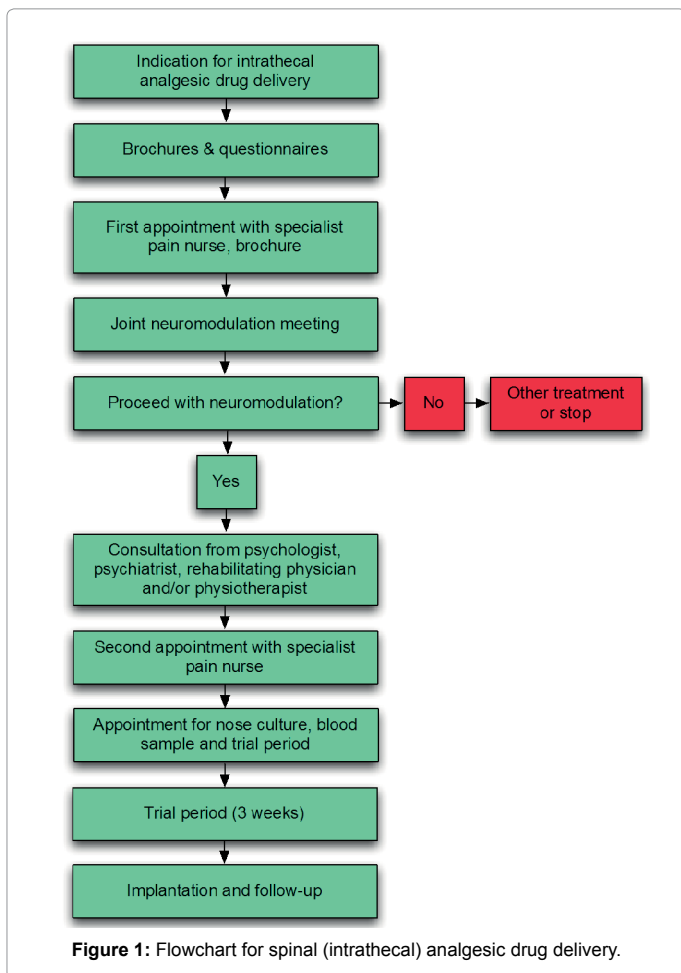
During the trial period, verbal Numerical Rating Scale (NRS) for

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pain decreased from 8 to 3 with 0.72 mg of spinal morphine (2 mg/mL, 0.36 mL/day) and no oral or transdermal opioids. The spinal morphine - and hydromorphone infusion schemes and verbal NRS for pain after implantation are presented in Table 2. Baseline and follow-up results from other questionnaires are presented in Table 3. The Hospital Anxiety and Depression Scale (HADS), RAND 36 item health survey (RAND-36), Pain Catastrophizing Scale (PCS), Four Dimensional Symptom Questionnaire (4DSQ) and Pain Coping Inventory (PCI) revealed improvement in parameters like general health, pain acceptance, anxiety and the catastrophizing pain condition; other questionnaires (Chronic Pain Acceptance Questionnaire (CPAQ), Oswestry Disability Index (ODI) and Tampa Scale for Kinesiophobia (TSK)) could not demonstrate an improvement. Wound healing was successful.

Discussion

This case report demonstrates that spinal analgesic drug delivery can be an option to treat chronic, widespread pain in patients with EDS, hypermobility type. Multidisciplinary consultation is necessary to deal with the wide variety of problems in these patients. Randomized controlled trials investigating the efficacy of spinal analgesia in patients with EDS (or other groups of patients with chronic pain) are needed; hopefully this case report can act as a stepping-stone towards conducting such a trial.

EDS is a group of inherited collagen disorders, affecting more than 1.5 million people around the world and producing a wide range of

Day	Morphine dose (mg/day)	Flow rate (mL/day)	NRS	Fentanyl dose (µg/h)
0	0.24	0.12	8	25
1	0.48	0.24	5	25
2	0.72	0.36	5	12
3	0.72	0.36	5	0
4	0.72	0.36	3	0
7	0.72	0.36	3	0
10	0.72	0.36	3	0
14	0.72	0.36	5	0
17	0.72	0.36	3	0

Table 1: Spinal morphine 2 mg/mL titration scheme during the trial period (NRS = verbal Numerical Rating Scale for pain).

Follow-up	Morphine dose (mg/day)	Flow rate (mL/day)	NRS
Day 1	0.72	0.36	3
1 week	0.72	0.36	3
1 month	0.72	0.36	3
2 months	0.72	0.36	5
3 months	0.80	0.40	5
4 months	0.80	0.40	2
	Hydromorphone Dose (mg/day)		
6 months	0.21	0.21	7
7 months	0.22	0.22	7
9 months	0.24	0.24	4
12 months	0.24	0.24	2

Table 2: Spinal morphine 2 mg/mL and hydromorphone 1 mg/mL infusion scheme during the follow-up period. (NRS = Verbal Numerical Rating Scale for pain). Because of an increase in weight, a change was made from morphine to hydromorphone; this resulted in a temporary increase in NRS for pain

symptoms and severity, three of them being chronic, debilitating pain, fatigue and poor wound healing. Men and women of all racial and ethnic backgrounds are affected. The hypermobility type (former type III) is most common [1-3]. Chronic pain is treated with opioids, heat therapy, splints or braces and surgical interventions [4]. The Ehlers-Danlos National Foundation has published multi-modal management programs for diminishing pain in patients with EDS, ranging from single (or a combination of) analgesics to surgical pain interventions such as implantation of spinal pumps [5].

In the patient presented in this case report, her chronic pain, measured by means of the verbal NRS for pain, decreased from 8 to 2 using continuous spinal analgesic drug delivery. Other questionnaires also revealed improvement in parameters like general health, pain acceptance, anxiety and the catastrophizing pain condition, but not all questionnaires demonstrated such a rise (Table 3). Because of an increase in weight with 15 kg, a change was made from morphine to hydromorphone and consultation from an internist was sought after, who found no explanation. After this change, weight decreased with 5 kg, but not to the level as before the use of spinal analgesic drug therapy. Changing the analgesic regimen also resulted in a temporary increase in NRS for pain, gradually declining from 7 to 2 after several months; reasons for this to occur could be the possibility that the dose and/or flow rate were insufficient, as compared to the morphine dose and flow rate. Before implantation of the spinal pump the patient complained of voiding problems as well as sexual (orgasm) problems; hormone levels were normal. The patient received therapy from a specialist pelvic physiotherapist. Voiding problems ceased to exist, the sexual problems remained unaltered.

Questionnaire	Baseline Results	3 month results	6 month results	1 year results
<i>HADS</i>				
Depression	12	6	9	7
Anxiety	8	5	5	4
<i>RAND-36</i>				
Physical functioning	15	50	35	30
Role-health	0	50	0	100
Role-emo	33.3	100	33.3	100
Energy/fatigue	15	45	30	30
Emotional	56	76	60	72
Social	37.5	62.5	50	62.5
Pain	22.5	67.5	35	67.5
General	30	35	35	35
Overall	25	100	50	75
<i>PCS</i>				
Rumination	7	2	6	3
Magnification	2	1	0	1
Helplessness	7	4	7	3
Overall	16	7	13	7
<i>CPAQ</i>				
Activities engagement	31			35
Pain willingness	33			27
<i>4DSQ</i>				
Distress	14			4
Depression	3			1
Anxiety	0			3
Somatisation	16			11
<i>ODI</i>				
	52			48
<i>TSK</i>				
	46			75
<i>PCI</i>				
Pain transformation	11			9
Distraction	12			11
Reducing demands	5			9
Retreating	18			14
Worrying	29			17
Resting	12			11

Table 3: Baseline - and follow-up results from questionnaires.(HADS = Hospital Anxiety and Depression Scale; RAND-36 = RAND 36 item health survey, almost identical to the Medical Outcome Study (MOS) Short Form-36 (SF-36); PCS = Pain Catastrophizing Scale; CPAQ = Chronic Pain Acceptance Questionnaire; 4DSQ = Four Dimensional Symptom Questionnaire; ODI = Oswestry Disability Index; TSK = Tampa Scale for Kinesiophobia; PCI = PainCoping Inventory).

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