



Case Report

Deep Venous Thrombosis Associated With Use of Intrathecal Baclofen Pump in Chronic Spinal Cord Injury: A Report of Two Cases

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Summary

By providing a direct and selective effect at the spinal cord level, intrathecal baclofen is used for the treatment of spasticity of spinal or cerebral origin, which is not alleviated with oral antispastic drugs. Besides its potent effect, it may result in several adverse events. The most common complications associated with intrathecal baclofen pump include mechanical problems with the device, procedure-related complications and drug side effects. We present two cases of deep venous thrombosis in patients with chronic spinal cord injury treated with long-term intrathecal baclofen pump for recurrent spasticity. Deep venous thrombosis was secondary to hypotonia that developed after increasing dose of baclofen released by the pump. Clinicians should be alerted for risk of deep venous thrombosis in patients with spinal cord injury receiving intrathecal baclofen. In the period of intrathecal baclofen dose changes, deep venous thrombosis prophylaxis may be considered for these patients even in chronic period of spinal cord injury.

Key words: Intrathecal baclofen pump, deep venous thrombosis, complication

Kronik Spinal Kord Yaralanmasında İntratekal Baklofen Pompası Kullanımı İle İlişkili Derin Ven Trombozu: İki Vaka Sunumu

Özet

İntratekal baklofen oral antispastik ilaçlar ile azalmayan spinal yada serebral kaynaklı spastisitenin tedavisinde, spinal kord seviyesinde selektif ve doğrudan etki sağlayarak kullanılmaktadır. Potent etkisinin yanında, bazı yan etkilere yol açabilmektedir. İntratekal pompa kullanımı ile ilgili en yaygın görülen komplikasyonlar cihaz ile ilgili mekanik problemler, cihazın takılma prosedürüne bağlı komplikasyonlar ve ilaç yan etkilileridir. Biz rekürren spastisitesi nedeniyle uzun süreli intratekal baclofen kullanan kronik spinal kord yaralı iki hastada gelişen derin ven trombozunu sunuyoruz. Derin ven trombozu hastalarda pompadan salınan ilacın dozunu artırılması sonrası gelişen hipotoniye bağlı olduğu düşünülmektedir. Klinisyenler intratekal baclofen pompası kullanan kronik spinal kord yaralı hastalarda derin ven trombozu açısından dikkatli olmalıdırlar. Doz değişim dönmlerinde, intratekal baclofen pompası kullanan spinal kord yaralı hastalarda kronik dönemde olsa dahi derin ven trombozu profilaksisi düşünülebilir.

Anahtar Kelimeler: İntratekal baclofen pompası, derin ven trombozu, komplikasyon

INTRODUCTION

Intrathecal baclofen (ITB) has been used for the treatment of spasticity of spinal or cerebral origin, which is not alleviated with oral antispastic drugs for more than two decades⁽⁷⁾. Baclofen, which resembles structurally gamma aminobutyric acid (GABA), shows the effect of spasmodolysis by binding GABA b receptors within brainstem, the dorsal horn of the spinal cord, and the other central nervous system sites.⁽⁶⁾ Intrathecal administration of baclofen provides direct and selective effect at the spinal cord level. Besides its potent effect, it may result in several adverse events. The most common complications associated with ITB pump include mechanical problems with the device, procedure-related complications like infections, cerebrospinal fluid leaks, and the drug side effects like drowsiness, sedation, weakness, hypotonia.^(4,7)

We present two cases of deep venous thrombosis (DVT) in patients with chronic spinal cord injury (SCI) treated with long-term ITB pump for recurrent spasticity. DVT was secondary to hypotonia, which developed after increasing the dosage of baclofen released by the pump. The objective of this report is to draw attention to necessity of monitoring patients with SCI receiving ITB or the risk of DVT, which is not a frequent condition in chronic SCI.

CASE PRESENTATION

Case One

A 30-year-old male patient who had a tetraplegia (C4 ASIA-A) due to a gunshot wound for 9 years had severe lower-extremity spasticity (average Ashworth Scale score of 3,5). The patient whose spasticity had not decreased enough with the treatment of physical therapy and oral baclofen at maximum doses underwent implantation of ITB pump in April 2003. He responded to ITB and was followed for ongoing management of his ITB pump. His

initial ITB rate was 150 mg/d. It was increased gradually to 300 mg/d according to spasticity symptoms through four years. In July 2007, he had again increase in symptoms and had lower extremity spasticity with average Ashworth Scale score of 3,5. Releasing dosage of ITB was determined to increase to 325 mg/d. Hypotonia in the lower extremities was observed with the new regimen. The next day, he developed left-sided calf swelling and warming. The venous Doppler studies showed an acute thrombus extending from the distal portion of the external iliac vein to superficial femoral vein and right mid thigh. The patient who had not taken an anticoagulation prophylaxis was started on Anticoagulation therapy with low molecular weight heparin and warfarin. The treatment resolved the thrombus. The patient maintained oral warfarin therapy six months.

Case Two

The patient, a 29-year-old man, had intractable lower extremity spasticity associated with C4 ASIA-A SCI secondary to a traffic accident in 2003. After failure of other anti-spasticity therapies, an ITB pump was implemented in May 2007. Initial ITB dose was 125 mg/d. He required a gradual upward titration of the infusion to 160 mg/d at which dose a favorable reduction in spasticity (mg/d) occurred through a year. In October 2008, he had increase in severity of the spasticity symptoms and had lower extremity spasticity with average Ashworth Scale score of 3,4. The rate of ITB was increased to 170 mg/d. He had relief of symptoms and hypotonia in the lower extremities. At the same day, he complained of rapid onset of pain and swelling in the left ankle, calf, and knee. An acute thrombus in the left superficial and deep femoral vein was revealed by the venous Doppler studies. The patient had not taken an anticoagulation prophylaxis till that time.

Standard anticoagulation therapy was started after the onset of DVT.

DISCUSSION

DVT has been reported in over %50 of patients with SCI in prospective studies,⁽⁸⁾ and mostly occurs within 3 months of acute SCI.⁽³⁾ The high risk of DVT in acute SCI is associated with the presence of three factors affecting thrombosis (also named Virchow triad): hypercoagulability, stasis and endothelial injury.⁽⁸⁾ The loss of the pumping action of large muscles in lower extremity after acute paralysis and the occurrence of venous pooling play major role in pathophysiology.

Complications of ITB use has been documented.^(4,7) Device-related pump and considerably catheter malfunctions, and procedure-related complications (infection, superficial wounds around the implant site, skin erosions, cerebrospinal fluid leaks, and collections around the device) correspond to two thirds and one thirds of IBP complications, respectively. Among the drug side effects of baclofen,^(1,4) drowsiness and hypotonia was reported as dose-related. Other commonly reported adverse effects were chemical meningitis, sedation, lethargy, cognitive dysfunction, headache, constipation, nausea, and vomiting. DVT has been reported once in an adolescent patient with cerebral palsy that used IBP for severe spasticity in lower extremities.⁽⁵⁾ This patient required a gradual upward dose of intrathecal baclofen due to catheter dysfunction. After catheter replacement surgery, administering more than adequate drug in early postoperative period and postoperative immobilization were noted to be responsible for the development of low-extremity DVT. Being with complete and high level spinal injury caused naturally immobilization of the patients in our report.

ITB pump was used in the present two patients with chronic SCI due to intractable spasticity and the patients experienced initial favorable reduction in spasticity.

However, both patients required gradual increase in infusion rate of ITB several times during follow-up. When they need a new ITB dose increase several years after implantations, DVT in lower extremities was seen. The mechanism of DVT in the patients with chronic SCI is likely accounted for by the low-extremity hypotonia and associated stasis secondary to potent spasmolytic effect of ITB. They had not developed DVT after previous dose changes. Even the dose changes was not different from previous ones, we couldn't explain why they had developed DVT at this time. The present patients did not have any predisposing factor for DVT such as malignancy or hypercoagulability.² What risk factors for developing DVT in patients using ITB such as drug doses, dose-related hypotonicity, conditions leading to immobilization are and in which circumstances prophylaxis against thrombosis should be considered are areas of future research.

The point, which this case report indicates, is that DVT can be associated with use of ITB pump which intractable spasticity responds well to. Clinicians should recognize that patients with high level SCI and other neurologic disorders causing immobilization that receive intrathecal baclofen should be followed closely for thrombosis especially in the period of dose changes.

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REFERENCES

1. Dario A, Scamoni C, Picano M, Casagrande F, Tomei G. Pharmacological complications of the chronic baclofen infusion in the severe spinal spasticity. Personal experience and review of the literature. *J Neurosurg Sci* 2004;48:177-81.
2. Ege DT, Duran DE, Yüksel DV, Çakır DH. An Important Factor in Etiology of Deep Venous Thrombosis: Malignancy. *Gulhane Med J* 2003;45:326-30.
3. Johns JS, Nguyen C, Sing RF. Vena cava filters in spinal cord injuries: evolving technology. *J Spinal Cord Med* 2006;29:183-90.
4. Kolaski K, Logan LR. A review of the complications of intrathecal baclofen in patients with cerebral palsy. *NeuroRehabilitation* 2007;22:383-95.
5. Murphy NA. Deep venous thrombosis as a result of hypotonia secondary to intrathecal baclofen therapy: a case report. *Arch Phys Med Rehabil* 2002;83:1311-2.
6. Plassat R, Perrouin Verbe B, Menei P, Menegalli D, Mathé JF, Richard I. Treatment of spasticity with intrathecal Baclofen administration: long-term follow-up, review of 40 patients. *Spinal Cord* 2004;42:686-93.
7. Stetkarova I, Yablon SA, Kofler M, Stokic DS. Procedure- and device-related complications of intrathecal baclofen administration for management of adult muscle hypertonia: a review. *Neurorehabil Neural Repair* 2010;24:609-19.
8. Teasell RW, Hsieh JT, Aubut JA, Eng JJ, Krassioukov A, Tu L; Spinal Cord Injury Rehabilitation Evidence Review Research Team. Venous thromboembolism after spinal cord injury. *Arch Phys Med Rehabil* 2009;90:232-45.