

Cutaneous herpes zoster and implantable pulse generator

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Introduction: Subthalamic nucleus deep brain stimulation has become a useful tool in effectively treating severe Parkinson's disease.

Method: While most reports in literature describe the immediate and short-term post-operative brain lead implant-related adverse events, we present the case of a 65-year-old man who developed herpes zoster (HZ) upon the subcutaneous placement of the pulse generator two years after the procedure.

Conclusion: He had excellent recovery of HZ lesions and related pain after specific antiviral therapy. The importance of a correct diagnosis of this unusual complication is outlined in order to minimize the risk of debilitating chronic HZ-associated pain.

Keywords: Brain surgery, deep brain stimulation, herpes zoster, implantable pulse generator, neurostimulation, Parkinson's disease, subthalamus

Conflict of interest: The authors reported no conflicts of interest.

INTRODUCTION

Subthalamic nucleus deep brain stimulation (STN DBS) has been effectively used to treat Parkinson's disease (PD) (1,2), allowing a reduction in medication requirements (3), and providing satisfactory control of motor fluctuations and the reduction of dyskinesias. Available long-term longitudinal studies document that STN DBS improves motor features in patients with PD past five years (4) and that the procedure is globally safe (5,6).

We present a patient with PD treated with STN DBS who developed delayed herpes zoster (HZ) infection in the site of the pulse generator placement, and had excellent lesions and pain relief following therapy with specific antiviral therapy.

CASE REPORT

A 65-year-old immunocompetent man reported a five-day history of burning and aching pain on his right chest and a four-day history of erythema and clusters of clear vesicles (Fig. 1, Panel A) along the right anterior T4 dermatome. Two years before, he had received bilateral STN-DBS for PD (3) followed by placement of one implantable pulse generator (IPG, Kinetra®, Medtronic, Minneapolis, MN, USA) in the right subclavicular region. The lesions were typically those of HZ virus infection (7) and primarily involved the skin above the IPG (Fig. 1, Panel B, arrows) sparing the surgical scar (Fig. 1, Panel B, arrowheads).

The patient received oral acyclovir (4 g daily for seven days) according to current clinical practice (7); a complete remission was achieved one month later, with no recurrence of lesions or occurrence of post-herpetic neuralgia for the following three years. Throughout the HZ manifestation up to complete recover, there was no deterioration of the patient's parkinsonian motor state and of STN DBS efficacy, and no need to increase the antiparkinsonian drugs daily dosage.

DISCUSSION

Herpes zoster is caused by the reactivation of latent varicella-zoster virus, which produces chickenpox (varicella) as a primary infection (7); its most distinctive feature is an unilateral, painful, vesicular rash with a dermatomal distribution. HZ is frequently associated with a variety of serious and potentially lethal complications in both immunocompetent and immunocompromised persons (8): Despite the wide spectrum of possible clinical presentations and variants, early diagnosis is recommended, given the availability of effective therapies (7,9,10). Both acute and chronic HZ-associated pain can be debilitating and poorly responsive to treatment once established (8,11); recently, subcutaneous stimulation of branches of peripheral nerves has been explored for the treatment of intractable postherpetic neuralgia (12).

The reported case is the first to describe a patient who developed HZ as a late adverse event of brain DBS; a previous available paper reported HZ following sacral nerve stimulation for overactive bladder (13). It is remarkable to observe HZ developing on the

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The authors have no disclosures. The related study was approved by the Università Cattolica's Ethics committee. The authors obtained signed informed consent from the patient.

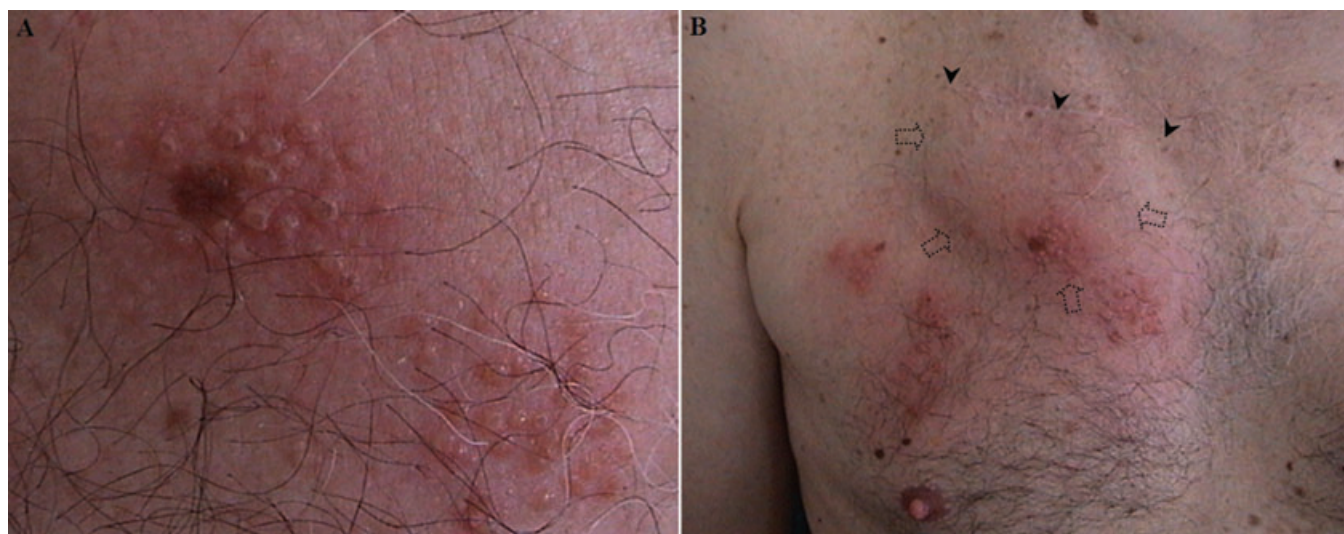


Figure 1. Panel A shows a close-up of the fresh erythematous—vesicular lesions. Panel B shows the involvement of the skin above the implanted pulse generator, involving the right T4 dermatome.

site of IPG positioning sparing the surgical scar. This finding likely indicates that continuous subcutaneous mechanical stress caused by the moving of the IPG inside the subcutaneous pocket (14) rather than the surgical scar itself could be enough to induce late HZ reactivation; this is partly consistent with other observations (15,16) though in most cases the surgical scar is the site of immediate (16,17) or delayed (18) HZ infections. In particular, it was observed that the occurrence of HZ peaked between 12 and 36 months after lung transplantation (19) and that there were no recurrent infections. HZ development with a sciatic nerve distribution also was reported after ipsilateral total hip arthroplasty, thus further highlighting the possibility of device-related or foreign body-induced shingle reactivation (20).

A recent review of adverse events following DBS considering 1154 PD patients does not report any HZ infection (21) in agreement with other studies following PD patients up to five years after implant (3,4,6,22,23). The rarity of the present case report could be alternatively explained in the light of the uncertainty about the actual incidence and accurate description and collection of all the possible adverse events and side-effects following DBS procedure, especially in the long term (6,21).

CONCLUSION

Early recognition of postoperative shingles is imperative for an appropriate management to reduce the short- and long-term pain control issues that could lead to severe patient's discomfort; neurologists and neurosurgeons involved in DBS follow-ups should be aware of this very rare post-surgical complication even occurring much later after the implant.

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COMMENTS

This brief short report shows how herpes zoster can be activated, even years after an IPG implant, at the site of the implanted pulse generator.

More importantly, it must be part of the differential diagnosis in the presence of redness, swelling and pain at the IPG implant site. Differential diagnosis, in a situation like this, would of course include bacterial infection of the hardware.

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The case presented by regarding cutaneous herpes zoster over the site of an implantable generator is of interest to the reader. The case is

such a rare occurrence it is difficult to make any substantial conclusion of the significance of the problem, but it should be published to educate the reader about this event. In many cases the surgeon may conclude that there is a burn, tape reaction, or superficial infection ongoing when the real problem is that of a viral eruption. Most implanters will not see this problem during their entire career, but it should be in the differential diagnosis for patients with skin abnormalities surrounding the internal programmable generator.

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