Case Report

Anesthetic management of deep brain stimulator implantation in Meige’s syndrome

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Abstract

Meige’s syndrome is rare form of orofacial dystonia. There is unfortunately no cure, but occasionally patients may improve with time. We present the successful management of a palladial deep brain stimulator (DBS) implantation for Meige’s syndrome. Dexmedetomidine infusion was used for sedation. The procedure lasted for around 12 h and the patient was comfortable, responsive, and cooperative over the extended period of time. The surgeons were comfortable with electrophysiologic brain mapping and clinical testing. DBS were implanted, through a burr hole, into the globus pallidus neurophysiological testing under guidance. The pulse generator battery was subcutaneously implanted into the chest wall under general anesthesia. The implanted pulse generator battery was started 2 days later and the patient showed dramatic improvement in his symptoms.

Key words: Dexmedetomidine, deep brain stimulator, Meige

Introduction

Meige’s syndrome is a rare type of oral facial dystonia. The main symptoms involve involuntary blinking and chin thrusting. Some patients may experience excessive tongue protrusion, squinting, muddled speech, or uncontrollable contraction of the platysma muscle. Implantation of deep brain stimulators (DBS) has been increasingly used for the treatment of Parkinson’s disease.[1,2] The procedure includes multiple steps: application of a stereotactic frame over the head under radiology imaging, implantation of the stimulator into the brain through a burr hole, guided by neurophysiological testing, and subcutaneous tunneling of the DBS wires. The demands of the procedure were challenging for anesthesiologist. The patient has to be comfortable, responsive over an extended period of time. We present a case of Meige’s syndrome in which successful palladial DBS implantation was done.

Case Report

A 60-kg, 54-year-old man presented with history of involuntary movement of perioral region, twitching of neck muscles and difficulty in swallowing since 3 years. There was also a history of difficulty in speech but no difficulty in breathing. Patient gives past history of some psychiatric illness for which he took treatment which was stopped 10 years back. There was no other significant history or history of any addiction. Patient was currently on oral tetrabenazine and clonazepine. Patient had received injections of botulinium for movement disorder. All investigations were within normal limits. On examination patient was conscious, cooperative, comfortable, and well oriented. Airway examination was normal.

The patient and his relatives were explained about the nature of the procedure and written informed consent was taken. He was explained about the need of cooperation during the procedure. No premedication was administered. The stereotactic rigid frame was applied to the patient’s head under local infiltration with 0.25% bupivacaine with epinephrine 1:200,000 in the preoperative holding area [Figure 1]. Patient was taken up for computed tomography (CT) localization for which no sedation was given to the patient. On arrival in the operating room, standard anesthesia monitoring was applied and supplemental oxygen was provided using Hudson mask. Venous access was taken on left hand and intravenous (IV) infusion was started slowly. The rigid headframe halo was anchored to the operating table in a position...
optimal for surgical approach, as well as for patient comfort. Dexmedetomidine was given initially as a bolus of 1 mcg/kg (60 mcg) over 10 min, which was followed by continuous IV infusion @ 0.5 mcg/kg/h. The vitals were observed continuously and the dose adjusted, between 0.2 and 0.7 mcg/kg/h, after assessing the sedation level every 30 min. The sedation end-point was a comfortable and tranquil patient who responded to oral commands. Burr-hole was made after local infiltration with bupivacaine (0.25%) and lignocaine (1%). The area of interest, in the globus pallidus, was localized with microelectrode recordings (MER) through the burr-hole and micropotentials of movement-related neurons were recorded. DBS electrodes were implanted and after macrostimulation testing of clinical changes in intensity of perioral movement and twitching of neck, to verify correct placement. During MER localization and the clinical testing of implanted DBS electrode lead, dexmedetomidine infusion rate was lowered to 0.2 mcg/kg/h. The patient responded well to oral commands. After the completion of DBS electrode lead implantation and testing, the stereotactic frame was removed. Dexmedetomidine infusion was continued and the patient was given general anesthesia for subcutaneous tunneling of the extension lead and implantation of the pulse generator subcutaneously into the chest wall. General anesthesia was induced with propofol 150 mg and endotracheal intubation was facilitated with muscle relaxant vecuronium 6 mg. Anesthesia was maintained with isoflurane and fentanyl 100 mcg. At the end of the procedure, the neuromuscular blockade was reversed with neostigmine and glycopyrrolate and trachea extubated. The procedure lasted for 12 h. Postoperatively patient was conscious, oriented, and stable. Diclofenac was given intramuscularly for postoperative analgesia. The implanted pulse generator battery was started 2 days later and within a week the patient showed dramatic improvement in his symptoms.

**Discussion**

Meige’s syndrome is a rare form of oral-facial dystonia and unfortunately is not treatable. Implantation of pallidal DBS for Meige’s syndrome is practiced in refractory cases and the results are effective. There are major anesthetic challenges during DBS implantations. An ideal anesthetic regimen for DBS implantation should consider patient comfort, hemodynamic stability, and respiratory sufficiency. In addition, the anesthetic goals in DBS implantation should include keeping the patient awake, cooperative, comfortable, and preserving the movement disorder for mapping purposes. Unfortunately, commonly used sedative drugs such as propofol and midazolam ameliorate tremor (or rigidity), involuntary movement, and interfere with brain mapping and testing of the implanted DBS electrode lead. Moreover, these medications easily impair the level of consciousness and may cause respiratory depression leading to disastrous complications due to difficulty with access to the airway, which is constrained by the bulky metal frame and the head fixed in a flexed position. Opioids may cause even more profound respiratory depression compared to benzodiazepines.

The pharmacologic profile of the α-2 agonist dexmedetomidine makes it appealing to use for DBS implantations as it provides sedation, maintains hemodynamic stability (controls hypertension), and causes minimal respiratory depression, even in large doses. We kept the continuous infusion of dexmedetomidine between range of 0.2–0.7 mcg/kg/h throughout the procedure. During the making of the burr-hole, the infusion rate was kept at 0.7 mcg/kg/h to deepen the sedation. Patient tolerated the procedure well and did not need any analgesia except local anesthetic infiltration. During MER and clinical testing we lightened the sedation by reducing the infusion rate to 0.2 mcg/kg/h. The patient stayed comfortable and sedated and the surgeons were satisfied with the patient’s cooperation during mapping. Dexmedetomidine did not ameliorate clinical signs of involuntary movements, as has been demonstrated earlier in a case series of DBS implantation in Parkinson’s disease.

Arterial hypertension is a major risk factor for intracerebral hemorrhage in DBS implantations and thus maintenance of blood pressure during procedure is important. The systolic blood pressure was less than 150 mmHg throughout the procedure demonstrating the hemodynamic stabilizing property of dexmedetomidine. Heart rate was maintained between 50 and 60/min and no hemodynamic instability was noted. During the major part of the procedure, patient was breathing spontaneously and saturation was maintained.

The role of dexmedetomidine as an anesthetic adjuvant is

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**Figure 1:** Patient with stereotactic frame
established.[7-9] We conclude that it is an effective agent in managing cases for DBS implantation.

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