Asphyxiation with a Fentanyl Patch

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Key Words

Fentanyl patch · Transdermal medication · Asphyxiation

Abstract

Narcotics are frequently prescribed to alleviate pain in patients with serious medical illnesses such as cancer. Because of their nonoral route of administration, fentanyl patches are now being frequently prescribed. However, the widespread use of fentanyl patches has been associated with medication errors and misuse [Butts and Jatoi: J Opioid Manag 2011;7:35–45]. The transdermal delivery of fentanyl may lead to unusual, unanticipated complications. Herein, we describe a fentanyl patch complication, which, to our knowledge, has not been previously reported.

Introduction

Fentanyl patches are often used to alleviate severe pain, particularly in cancer patients. However, the transdermal delivery of fentanyl may lead to unusual complications [1]. Previous reports describe patients chewing on patches, applying more than the number of prescribed patches to the skin, and applying a patch to an area with a skin abrasion – all of which can lead to fentanyl toxicity [1]. Continued vigilance among healthcare providers to detect misuse of this transdermal medication is of paramount importance to prevent untoward adverse events including death. Herein, we describe a fentanyl patch complication, which meets our Institutional Review Board standards for minimal risk reporting in a de-identified manner, as provided below, and which, to our knowledge, has not been previously reported.

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Case

A 60-year-old man presented to our clinic for a follow-up visit, at which time he appeared despondent. Two years prior, he had been struck by a motor vehicle and fractured his first lumbar vertebra. This fracture was treated with an L1 corpectomy and an instrumented fusion from T12 to L2. This complication coupled with the diagnosis of cancer, as outlined below, resulted in the patient being treated almost ever since with transdermal fentanyl for a chronic pain syndrome.

A few months earlier, a hematologic evaluation for leukocytosis had led to the diagnosis of systemic mastocytosis with an associated clonal hematologic non-mast cell lineage disease, chronic myelomonocytic leukemia type 1 (CMML-1). The patient was subsequently found to have leukemia cutis and eosinophilic myocarditis. Symptoms of pruritus and dyspnea improved with high-dose steroids and hydroxycarbamide. The steroids were tapered slowly over months, and the patient started azacytidine in place of hydroxycarbamide to treat his CMML-1. However, during this evaluation process and treatment for mastocytosis and CMML-1, the patient remained on a fentanyl patch (100- μ g/h patch every 72 h). He had no history of a psychiatric disorder, but he had experimented with psychotropic substances in his youth and had a flat affect at baseline.

When the patient presented for his second cycle of azacytidine, he appeared despondent and described shortness of breath. He provided limited answers to questions, with poor eye contact throughout the interview. An accompanying friend reported that the patient had been less communicative over the preceding 4 days and had complained of shortness of breath. The patient's heart rate was 96 beats/min, blood pressure 116/77 mm Hg, SpO₂ 94%, temperature 37.0°C, and respiratory rate 16 breaths/min. The circumference of the left leg was 5 cm greater than that of his right leg, and his lungs were clear to auscultation. The patient was not wearing a fentanyl patch at the time of this examination.

The results of this presentation raised concerns about a pulmonary embolus, and the patient was thought to be at high risk (Well's score of 7 due to clinical signs of deep venous thrombosis, likely diagnosis of pulmonary embolism, and active malignancy). He was not treated immediately with anticoagulation due to his thrombocytopenia ($36 \times 10^3/\mu$ l) and renal insufficiency (creatinine 2.3 mg/dl). A lower-extremity Doppler ultrasound did not reveal occlusive thrombus and chest radiography was unremarkable. Computerized tomography (CT) of the chest with contrast was not pursued due to renal insufficiency. However, because of declining sensorium concurrent with a dropping blood pressure of 89/45 mm Hg, a CT of his head was obtained. This imaging revealed an 8-mm left frontal and parietal subacute on chronic subdural hematoma without mass effect; this finding remained stable on subsequent scans.

The patient's worsening mental status and other symptomatology in the setting of an unclear diagnosis prompted hospitalization. Shortly thereafter, the patient experienced a brief tonic seizure that resolved spontaneously followed by a second more prolonged tonic seizure that involved right gaze deviation and tonic posturing of both arms. He was treated with lorazepam, and the seizure resolved with no recurrent events. The decision was then made to intubate the patient for airway protection.

Direct laryngoscopy revealed a transparent, folded, plastic-appearing item superior to the glottis. It was removed and identified as a fentanyl patch. Full bronchoscopy was performed to ensure that no other foreign objects had been aspirated, and none were found. Two doses of naloxone 0.4 mg were administered intravenously. The patient's mental status soon improved and the endotracheal tube was removed. He was evaluated by psychiatry. The patient had no explanation for the discovery of a fentanyl patch in his larynx, but he

denied any intention to harm himself. To date, it remains unclear exactly how the patch came to be positioned in this patient's larynx. The patient was discharged from the hospital with follow-up plans for the treatment of his hematologic conditions.

Discussion

This case represents an unusual and unexpected complication related to the ongoing use of a fentanyl patch. This patient apparently attempted to ingest a fentanyl patch, which became lodged within his larynx. Heat can increase the absorption of fentanyl [2], and, perhaps, the higher laryngeal body temperature resulted in increased transmucosal absorption of the medication, hence the manifestations of overdose, despite the patient's long-standing use of this medication.

This case provides further confirmation of the need for sustained, heightened vigilance for drug adherence with transdermal fentanyl. In a systematic review of the complications of opioid medications, fentanyl was the opioid most commonly implicated in such untoward events [1]. The most frequent cases of misuse included drug-drug interactions which potentiated narcotic effects or resulted in serotonin syndrome. Other problems with fentanyl relate to the acceleration of its transdermal absorption or experimentation with alternate routes of administration. Although external heat sources have been used to maximize the euphoric effects of fentanyl, other patients have suffered unintentional overdoses from hyperthermia [3], sun tanning [4], and warming blankets [5]. Patients have been reported to lick and chew or rectally insert transdermal fentanyl patches, and inject or inhale volatilized extracts from the patches [6]. Mishandling of fentanyl patches has even resulted in unintentional toxicity for caregivers [7]. Misuse of fentanyl can be fatal [8]. Inappropriate use of transdermal fentanyl patches may be more common than currently recognized and should be considered in fentanyl-treated patients who present with signs of narcotic toxicity.

The patient in this report had a near fatal event after asphyxiation with a fentanyl patch. Direct visualization of the fentanyl patch led to this unexpected diagnosis. This case represents the first report, to our knowledge, of asphyxiation with transdermal fentanyl and highlights the need for an awareness for complications with the use of narcotics, particularly of transdermal fentanyl and particularly under circumstances in which the prescribed patch is absent from the skin.

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