

# Steroid-Induced Psychosis after EUS-Guided Celiac Plexus Blockade

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## ABSTRACT

A 46-year-old female with no previous personal or family psychiatric history underwent endoscopic ultrasound (EUS)-guided celiac plexus blockade (CPB) to treat pain related to cystic fibrosis transmembrane conductance regulator-associated chronic pancreatitis. She had excellent response to her first three CPBs using bupivacaine and triamcinolone. The patient's subsequent CPBs were complicated by symptoms of racing thoughts, delusional thinking, and insomnia. She was diagnosed with acute psychosis secondary to triamcinolone. This is the first reported case of steroid-induced psychosis caused by EUS-guided CPB. Optimal treatment for steroid-induced psychiatric symptoms include dose reduction or discontinuation of steroids and administration of lithium, valproic acid, or atypical antipsychotics.

## INTRODUCTION

Endoscopic ultrasound (EUS)-guided celiac plexus blockade (CPB) and neurolysis were first described in 1996 and have since been shown to be effective procedures for the management of abdominal pain in the setting of chronic pancreatitis and pancreatic cancer, respectively.<sup>1,2</sup> The most common complications following EUS-guided CPB include transient symptoms such as self-limited diarrhea and hypotension.<sup>3</sup>

## CASE REPORT

A 46-year-old woman with no previous personal or family psychiatric history underwent EUS-guided CPB to treat severe pain from chronic pancreatitis related to mutations in the cystic fibrosis transmembrane conductance regulator (CTFR) gene. In addition to opioid pain management, the patient underwent successful EUS-guided CPBs at 4-month intervals and had received 3 CPBs in the previous 13 months. Her procedures were performed via the standard transgastric approach. Color Doppler guidance was used to confirm a lack of significant vascular structures within the injection needle path, and needle aspiration was performed prior to injection to exclude entry into a blood vessel (Figure 1). A total of 20 mL 0.25% bupivacaine and 2 mL 40 mg/mL triamcinolone (80 mg) were injected in the area of the celiac plexus using a 20-gauge needle during each procedure (Figure 2).

The patient tolerated her first 3 procedures well and achieved excellent pain relief without any significant post-procedural complications. After her fourth EUS-guided CPB, the patient noticed racing thoughts for 2 weeks. These symptoms resolved spontaneously, and she did not share her symptoms with her treating physicians. After her next procedure, the patient began experiencing symptoms of mania, including racing thoughts, delusional thinking, pressured speech, extreme anger, and insomnia. She also developed severe depression and anxiety, with 1 episode of suicidal ideation. She was subsequently diagnosed with acute psychosis secondary to triamcinolone and newly diagnosed bipolar disorder. The patient was treated with clonazepam and lithium, with complete resolution of her symptoms after several weeks. Following multidisciplinary review, it was felt that the risk of recurrent psychosis

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**Figure 1.** EUS image identifying the celiac axis with lack of significant vascular structures within the injection needle path.

following subsequent CPBs outweighed the potential benefit of any temporary pain relief the patient received. The patient subsequently underwent a total pancreatectomy and has had an uneventful medical and psychiatric post-operative course.

## DISCUSSION

This is the first reported case of acute steroid-induced psychosis caused by EUS-guided CPB. While steroid-induced psychosis after administration of systemic corticosteroids has been extensively reported since the introduction of corticosteroids in the early 1950s, psychosis from regional administration is much more rare.<sup>4</sup> Episodes of acute psychosis following epidural, intramuscular, and intraarticular corticosteroid administration have been reported.<sup>5-7</sup> To our knowledge, only two cases of acute psychosis following regional CPB have been reported.<sup>8</sup> In both of these cases, the patients received an anesthesiologist-administered CPB



**Figure 2.** EUS image showing successful injection of triamcinolone/bupivacaine in the area of the celiac plexus.

with triamcinolone via a posterior approach under fluoroscopic guidance. Additionally, both patients also had a known history of steroid-induced psychosis from previous systemic corticosteroid administration.

The pathophysiology by which corticosteroids cause psychosis is not fully understood. Suppression of the hypothalamus-pituitary axis and enhanced dopamine neurotransmission has been postulated as a cause.<sup>9</sup> Decreased hippocampal volume has been demonstrated in patients receiving chronic corticosteroid therapy for >6 months, leading some to suggest that the action of corticosteroids at steroid-specific receptors in the hippocampus results in a decreased ability to filter irrelevant stimuli.<sup>10,11</sup> Risk factors for the development of steroid-induced psychosis are not known. A history of psychiatric illness and previous courses of corticosteroids had been hypothesized to increase risk, but both of these predictors appear to be unreliable.<sup>10</sup> There are no reported associations between psychiatric disease or acute psychosis and the presence of CTRF mutations. Optimal treatment for patients presenting with steroid-induced psychiatric symptoms include dose reduction or discontinuation of steroid therapy and administration of lithium, valproic acid, neuroleptics, or atypical antipsychotics.<sup>12</sup> Most patients will have improvement of symptoms within 2 weeks of initiation of treatment.

As the patient in this case received a combination of corticosteroids and local anesthetic, it is important to note that local anesthetics have also been associated with psychological phenomena. Several cases of patients experiencing hallucinations following administration of lidocaine, procainamide, bupivacaine, mepivacaine, and procaine for the purpose of regional anesthesia, pain relief, or management of ectopies have been reported.<sup>13</sup> However, the majority of these patients experienced vivid fear of imminent death or delusional beliefs of having died rather than overt psychosis.

It is important for endoscopists to be aware of the potential adverse side effects associated with steroid administration following EUS-guided CPB. While steroid-induced psychosis from EUS-guided CPB appears to be a rare entity, prompt recognition and treatment will help prevent further complications from untreated symptoms and repeated steroid administrations.

## DISCLOSURES

Author contributions: DC Olson wrote and revised the manuscript. JJ Lewis edited the manuscript and is the article guarantor.

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## REFERENCES

1. Wiersema MJ, Wiersema LM. Endosonography-guided celiac plexus neurolysis. *Gastrointest Endosc*. 1996;44:656-62.
2. Kaufman M, Singh G, Das S, et al. Efficacy of endoscopic ultrasound-guided celiac plexus block and celiac plexus neurolysis for managing abdominal pain associated with chronic pancreatitis and pancreatic cancer. *J Clin Gastroenterol*. 2010;44:127-34.
3. Fabbri C, Luigiano C, Lisotti A, et al. Endoscopic ultrasound-guided treatments: Are we getting evidence based - a systematic review. *World J Gastroenterol*. 2014;20(26):8424-48.
4. Hall RC, Popkin MK, Stickney SK, et al. Presentation of the steroid psychoses. *J Nerv Ment Dis*. 1979;167:229-36.
5. Benyamin RM, Vallejo R, Kramer J, et al. Corticosteroid induced psychosis in the pain management setting. *Pain Physician*. 2008;11(6):917-20.
6. Teuber I, Freiwald D, Volz HP. Acute paranoid symptoms following intramuscular injection of nandrolone. *Psychiatr Prax*. 2003;30(Suppl 2):73-4.
7. Robinson DE, Harrison-Hansley E, Spencer RF. Steroid psychosis after an intra-articular injection. *Ann Rheum Dis*. 2000;59(11):927.
8. Fishman SM, Catarau EM, Sachs G, et al. Corticosteroid-induced mania after single regional application at the celiac plexus. *Anesthesiology*. 1996;85:1194-6.
9. Schatzberg AF, Rothschild AJ, Langlais PJ, et al. A corticosteroid/dopamine hypothesis for psychotic depression and related states. *J Psychiatr Res*. 1985;19(1):57-64.
10. Naber D, Sand P, Heigl B. Psychopathological and neuropsychological effects of 8-days' corticosteroid treatment. A prospective study. *Psychoneuroendocrinology*. 1996;21(1):25-31.
11. Brown ES, J Woolston D, Frol A, et al. Hippocampal volume, spectroscopy, cognition, and mood in patients receiving corticosteroid therapy. *Biol Psychiatry*. 2004;55(5):538-45.
12. Brown ES, Chandler PA. Mood and cognitive changes during systemic corticosteroid therapy. *Prim Care Companion J Clin Psychiatry*. 2001;3:17-21.
13. Marsch SC, Schaefer HG, Castelli I. Unusual psychological manifestation of systemic local anesthetic toxicity. *Anesthesiology*. 1998;88(2):531-3.