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Successful treatment with electroconvulsive therapy of a patient with bipolar disorder and a 7-mm cerebral aneurysm

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Dear Sir

Ms. N is a 54 year old woman who was admitted to our inpatient unit for exacerbation of bipolar depression, type I. Six months prior to admission she experienced a brief manic episode, following which her mood dropped precipitously. After medication adjustments failed to alleviate her depression, she was admitted for expedited initiation of electroconvulsive therapy (ECT). At the time of admission, her medications included lamotrigine, lithium, and olanzapine. Her medical history was notable for hypertension as well as a 7-mm cerebral aneurysm located in the left cavernous sinus. Her hypertension had been successfully managed with amlodipine-valsartan-hydrochlorothiazide 10-160-12.5mg daily. The aneurysm had been discovered incidentally from an MRI 4 years prior that she had for a workup of diplopia (since resolved).

Given the relatively low risk of spontaneous rupture associated with an aneurysm of this size, the patient had annual follow up with neurosurgery for expectant management without intervention. The aneurysm had remained stable in size for the following 4 years. After consultation with neurosurgery and anesthesiology as well as informed consent including a thorough discussion of the risks and benefits of the treatment, right unilateral ECT was initiated, administered three times a week using a MECTA Spectrum 5000Q machine. Methohexital was used as the anesthetic agent (dose range 80–150mg), succinylcholine was used as the paralytic agent (dose range 50–60mg), and midazolam 2mg was used post-ictally to control emergence agitation. IV ketorolac 30 mg was administered for headache as needed pre-treatment.

During the first ECT session, peri-ictal blood pressure peaked at 186/108 mm Hg. She was given 5mg IV labetalol pre-treatment prophylactically, but required an additional 30mg given her elevated blood pressure. Post-ictal blood pressure (BP) ranged from 96–139 / 55–77 mm Hg, with HR ranging from 71–98 beats per min. In her second session, she received 5mg IV labetalol prophylactically (max BP was 160/95 mm Hg). Post-ictal BP was 94/46 mm Hg. She did not receive labetalol on subsequent sessions. The patient underwent 9 ECT treatments, then gradually transitioned to a continuation/maintenance schedule. To date, she has had 20 ECT treatments. Her mood symptoms improved significantly and she continues

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in a euthymic state on maintenance treatments. There have been no neurological symptoms reports by the patient or signs observed by her treatment team.

ECT remains the the most effective treatment for treatment-resistant depression.¹ Although widely accepted as a safe treatment modality with no absolute contraindications, several relative contraindications exist. Given the transient but sometimes significant increase in blood pressure as well as intracerebral pressure peri-ictally, administering ECT to patients with cerebral aneurysm may theoretically increase the risk of rupture. The potential risks and benefits, as well as the size and location and other clinical factors should be carefully deliberated when considering treatment in such patients.

Previous case reports and series document 9 patients with untreated/unruptured cerebral aneurysm that were treated with ECT without signs or symptoms of aneurysm rupture. There have also been at least 6 cases of patients with ruptured or treated aneurysms successfully treated with ECT.²

This paper presents the tenth reported case of ECT in a patient with intact or unrepaired cerebral aneurysm. Although our patient had a history of hypertension, which may be a risk factor for aneurysm rupture,^{3,4} prophylactic administration of labetalol and close monitoring of the blood pressure provided uneventful treatment. The patient did not need additional prophylactic antihypertensive medication following the second ECT session given her relatively normal peri-ictal blood pressure measurements.

As called for previously,² providers should report subsequent cases of ECT treatment in patients with intracranial aneurysms to expand the existing knowledge base regarding this special clinical situation. Given the prevalence of intracranial aneurysms, it is likely that many more patients with undiscovered aneurysms have undergone ECT uneventfully. It is reassuring that there is no reported case of a ruptured aneurysm in conjunction with ECT. However, given our lack of understanding on the role of acute as well as chronic hypertension as risk factors for aneurysm rupture, caution should be utilized when administering ECT to such patients. Based on our experience with this and prior cases, we recommend close monitoring of blood pressure and prophylactic administration of a fast-acting and short-acting IV antihypertensive as needed.

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