

Introduction

Transcranial Doppler (TCD) with bubble study has been used to detect the presence of a right to left shunt in patients undergoing evaluation for cryptogenic strokes. In this case report we discuss case of a patient who presented with complaints of arm cyanosis and discoloration followed by transient global amnesia (TGA) symptoms following agitated bubble injection for TCD study.

Case Presentation

A 17-year-old male with a past medical history of Irritable bowel syndrome presented to the emergency department for transient episode of confusion, forgetfulness, repeated questioning as well as right arm cyanosis and discoloration after undergoing transcranial doppler procedure (TCD) with bubble study. Patient initially was hospitalized a month prior for acute onset aphasia and right sided weakness when he received thrombolytic therapy due to concern for acute stroke. Follow up CT head, CTA head and neck as well as MRI of the brain were negative for signs of ischemia or cerebral vascular disease. Patient was discharged with antiplatelet therapy and outpatient neurological workup, including TCD with bubble study. Patient presented again to ED twice after initial presentation with similar symptoms of aphasia and right arm numbness this time associated with migrainous type headaches and was diagnosed with complex migraine headaches.

Case Presentation Cont.

For further work up, the patient then presented to the neurology clinic a couple weeks later for the TCD with bubble study. Shortly after injecting agitated saline and doing valsalva maneuver, the patient started developing altered mental status, anterograde amnesia, and right hand pallor-cyanotic skin changes up to the shoulder. The whole event lasted for nearly one hour, then symptoms resolved completely once transferred to the ED department. CT head and MRI of the brain again showed no abnormality. CTA of the right arm showed no vascular abnormality except for small, nonspecific foci of gas adjacent to the arteries in the elbow and upper arm. CT chest, abdomen, and pelvis was also negative for any signs of arteriovenous malformation. Patient exhibited no residual neurologic symptoms while hospitalized, and was discharged with migraine prophylaxis medications and outpatient neurology follow up.

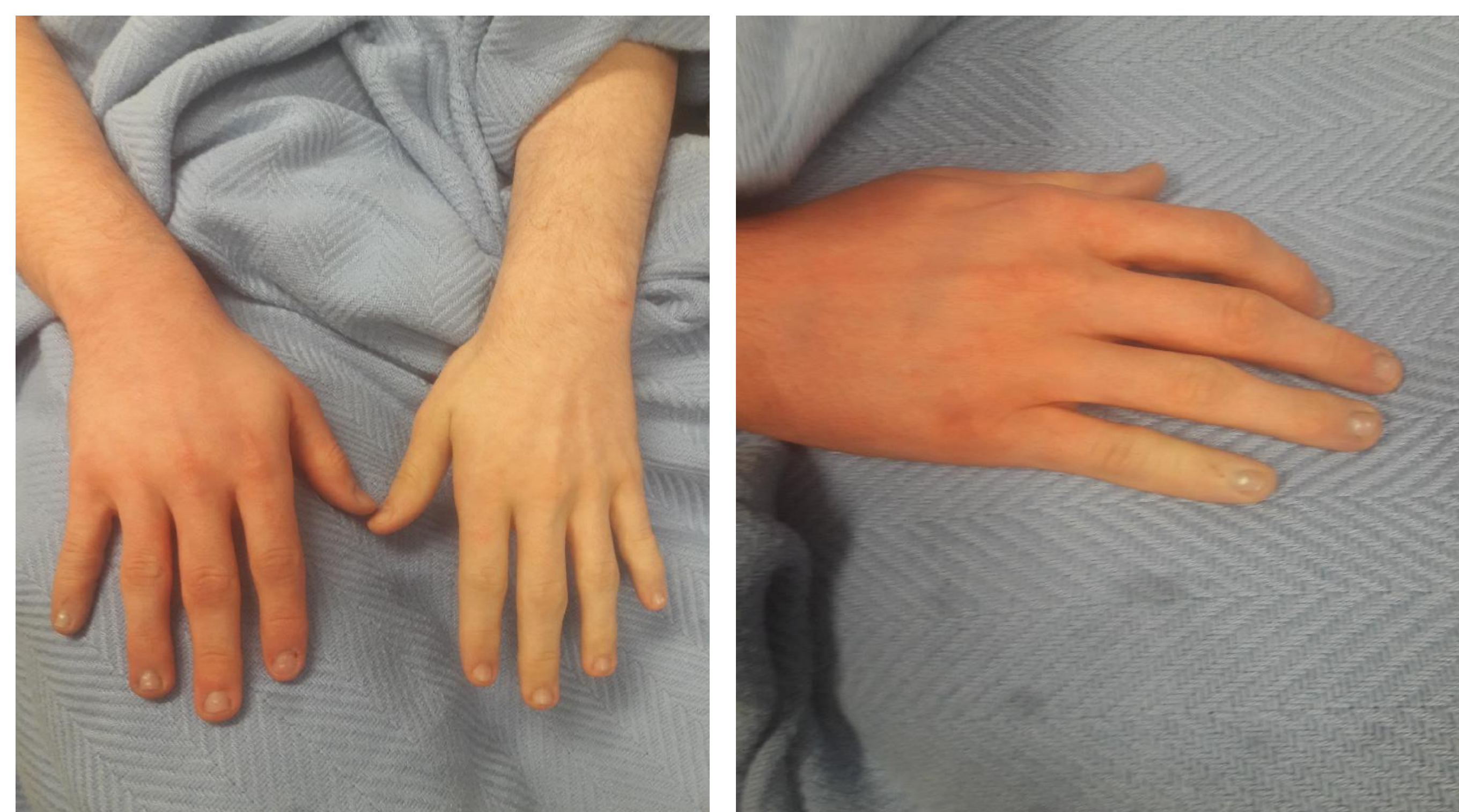


Figure1: Cyanotic changes seen in the right arm of patient shortly after agitated saline injection for TCD.

Discussion

Safety of TCD with bubble study has been evaluated previously in literature. A previous retrospective study by the American Academy of Neurology has suggested that cerebrovascular ischemic events may occur in patients who undergo TCD or transoesophageal echocardiography with bubbles although from 5 cases assessed in that study only one event was related to TCD.

Conclusion

In this case, the episode of TGA was likely related to valsalva maneuver, a known trigger for TGA. The pallor and cyanotic changes may have been related to a vasospastic phenomenon given negative vascular imaging of the arm. With no previous reports in literature and negative vascular imaging, the etiology of a transient vasospastic phenomenon type symptoms following bubble injection however remains unclear.

References

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- Lao AY, Sharma VK, Tsvigoulis G, Malkoff MD, Alexandrov AV, Frey JL. Effect of body positioning during transcranial Doppler detection of right-to-left shunts. *Eur J Neurol*. 2007; 14: 1035–1039