



Clearing the Smoke: Using Isoproterenol and Carotid Sentinel Protection Device in Left Atrial Appendage Occlusion

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Introduction:

Left atrial appendage (LAA) occlusion with the Watchman device is indicated in patients with a long-term contraindication to anticoagulation and need for stroke prophylaxis. However, the procedure is contraindicated in patients with LAA thrombus to avoid the risk of systemic embolization from clot dislodgement caused by procedural manipulation. Left atrial (LA) spontaneous echo contrast (SEC), or "smoke," is a frequent finding on transesophageal echocardiography (TEE). LA SEC is characterized by dynamic smoke-like echoes within the LA cavity or appendage. Most patients with LA SEC have atrial arrhythmias, an enlarged LA, or conditions that are associated with LA stasis. Case reports have described SEC clearing with isoproterenol. Furthermore, cardioembolic protective device placement has been studied in the transcatheter aortic valve replacement (TAVR) population and shown to safely capture debris dislodged during the procedure in 99% of patients. Here we describe a patient with LAA SEC who underwent LAA occlusion using isoproterenol to clear SEC and prophylactic carotid sentinel protection device.

Case Report:

An 87 year old female with a past medical history of paroxysmal atrial fibrillation on oral anticoagulation and recurrent gastrointestinal bleeding secondary to arteriovenous malformation presented for LAA occlusion. On preoperative TEE, SEC was observed in the LAA but no thrombus was identified. She was placed on six weeks of oral anticoagulation (OAC) with eliquis after clearance from gastroenterology. During this period she had several episodes of recurrent gastrointestinal bleeding requiring hospitalization. At the end of six weeks of OAC repeat TEE again showed SEC but no obvious thrombus. LAA was considered given her recurrent GI bleed and significantly elevated stroke risk. We decided to use upfront isoproterenol in an attempt to clear SEC for better visualization of LAA. Initial intraoperative TEE images again demonstrated SEC. We began infusion with isoproterenol at 5 mcg/min. After 10 minutes of infusion SEC had significantly improved. No thrombus was identified. Next, the SENTINEL cerebral protection device was deployed in the brachiocephalic and left carotid arteries according to the standardized protocol. A 31 mm WATCHMAN FLX device was then deployed with adequate compression, seal, position, and stability. The patient was successfully discharged from the hospital and presented for outpatient follow-up without any neurologic deficits or evidence of systemic thromboembolism.

Discussion:

LAA occlusion is contraindicated in patients with LAA thrombus due to concerns over embolization and subsequent cerebrovascular accident. SEC is associated with states of LA stasis and can make it difficult to visualize the LAA. Previous studies have used isoproterenol after electrical cardioversion to increase LAA emptying velocity. In our case, we used upfront



isoproterenol infusion for better visualization of the LAA. This allowed LAA occlusion to proceed and prevented delay of treatment in this patient who was a poor candidate for long term anticoagulation. Given our patients elevated risk for thrombus, we decided to employ a sentinel carotid filter device for added protection. Case reports have been documented with patients having successful WATCHMAN placement with chronic LAA thrombus as well as with mitral valve mass using cardioembolic protection systems. Knowing that debris dislodgement is also possible during Watchman insertion, we opted to use cerebral protection to provide added protection to our high-risk patient.

References:

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