Unlocking Early Detection: Non-Contrast Chest CT for Embolized Watchman Devices

Jamil Ayesha, M.D.; Patel Simran, M.B.B.S.; Patel Sanjeev, M.D.; Amygdalos Michael, M.D.
Bayhealth Medical Center, Dover, DE

Purpose

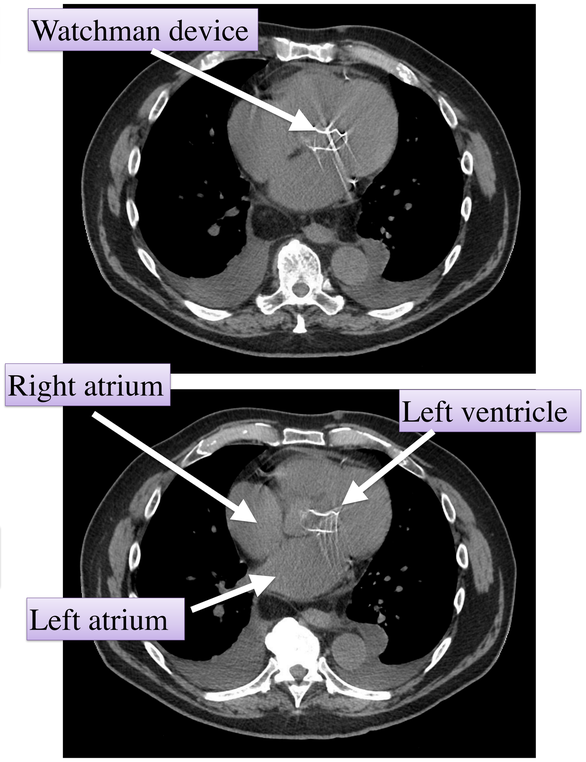
- To identify the Watchman device on non-contrast CT and distinguishing it from calcifications and other devices (e.g., TAVR) in abnormal locations.
- To discuss the potential for routine post-procedural CT scans as a non-invasive method for detecting complications.
- To introduce a quicker, less invasive procedure that doesn't require NPO status unlike TEE, reducing patient hesitancy in seeking care when experiencing concerning symptoms.

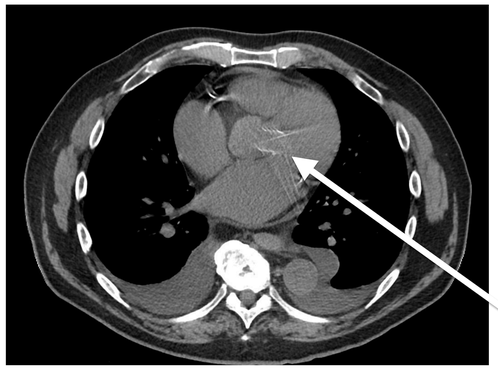
Method

- We encountered a case of missed identification of an embolized Watchman device on a non-contrast chest CT leading to unnecessary aortotomy, aortic and mitral valve replacements.
- It prompted us to review whether non-contrast CT could help detect dislodged devices early. Unlike peri device leak detection, which requires contrast, we aimed to assess non-contrast CT's effectiveness in identifying dislodged devices.
- Recent advancements, including Kaafarani et al.'s study on periprocedural CT for LAAO placement and post-procedure evaluation, are promising
- Additionally, 3D CT is being explored for device sizing and deployment, and contrast-free LAAC with the Watchman FLX is a safe alternative for patients with severe CKD.

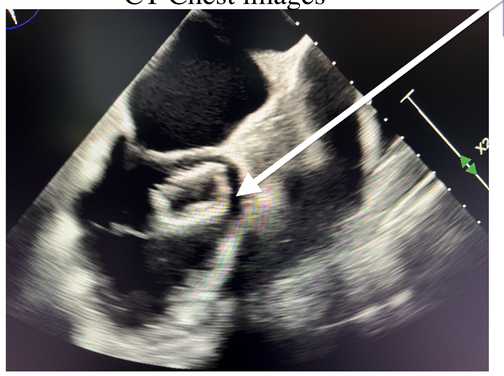
Result

- The Watchman device can be identified on non-contrast CT by its distinct mushroom-like shape and radiopaque markers.
- In our case, a re-review of the images revealed the embolized device.





CT Chest images



TEE image

Watchman at the left ventriculatr outflow

TEE	CT chest
1. Operator dependent	1. Quicker and more readily available in healthcare settings
2. Difficulty to visualize the entire device especially if device was placed in hard to reach area	2. Better spatial resolution and broader field of view not just confined to left atrium, enabling visualization of surrounding structures such as aorta, pulmonary vessels, any thrombus formation or related complications
3. Requires sedation	3. Reduce patient discomfort and risk
4. Since TEE is invasive, it carries risk of complications	4. Allows comprehensive monitoring over time especially in asymptomatic patients
	5. Cost effective and fast leading to quicker decision making and better patient outcomes

Key features distinguishing Watchamn from other devices include

- Location relative to heart chambers
- Unique structural design (filaments/anchors) causing characteristic CT artifacts/ shadows
- Surrounding changes if embolized(e.g., edema or ischemia)

Conclusion

- Current evidence suggests non-contrast CT could replace TEE for accurate Watchman device placement and follow-up, reducing contrast use.
- Further studies are needed to confirm its ability to reliably detect embolized devices in symptomatic post-procedure patients, saving time and resources.
- Early detection of the dislodged Watchman device on the initial CT scan can prevent significant morbidity.