

A Case to Cause Pause

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Background

Sinus pause, an ephemeral disruption in sinus rhythm attributable to the failure of impulse generation within the sinoatrial (SA) node, poses a diagnostic conundrum. The determination of a true sinus pause is subject to varying perspectives, with a prevailing consensus suggesting a duration exceeding 2-3 seconds [Ferrer, 1973]. It is imperative to discriminate sinus pauses from SA nodal exit block, a distinction that may necessitate an electrophysiological (EP) study [Nattel, 2002]. While sinus pauses typically linger within the 2-3 second temporal domain, instances of prolonged pauses, surpassing 10 seconds, may precipitate symptoms such as presyncope, syncope, dizziness, lightheadedness, dyspnea, dyspnea on exertion, and exacerbation of angina [Ferrer, 1968]. The presented case illuminates a noteworthy occurrence wherein a patient manifested a sinus pause subsequent to the resolution of her dysrhythmic episode in the Emergency Department (ED). This observation may engender a novel consideration even amongst seasoned Emergency Medicine (EM) attendings, augmenting the complexity of sinus pause management within the clinical milieu [Allessie, 1998].

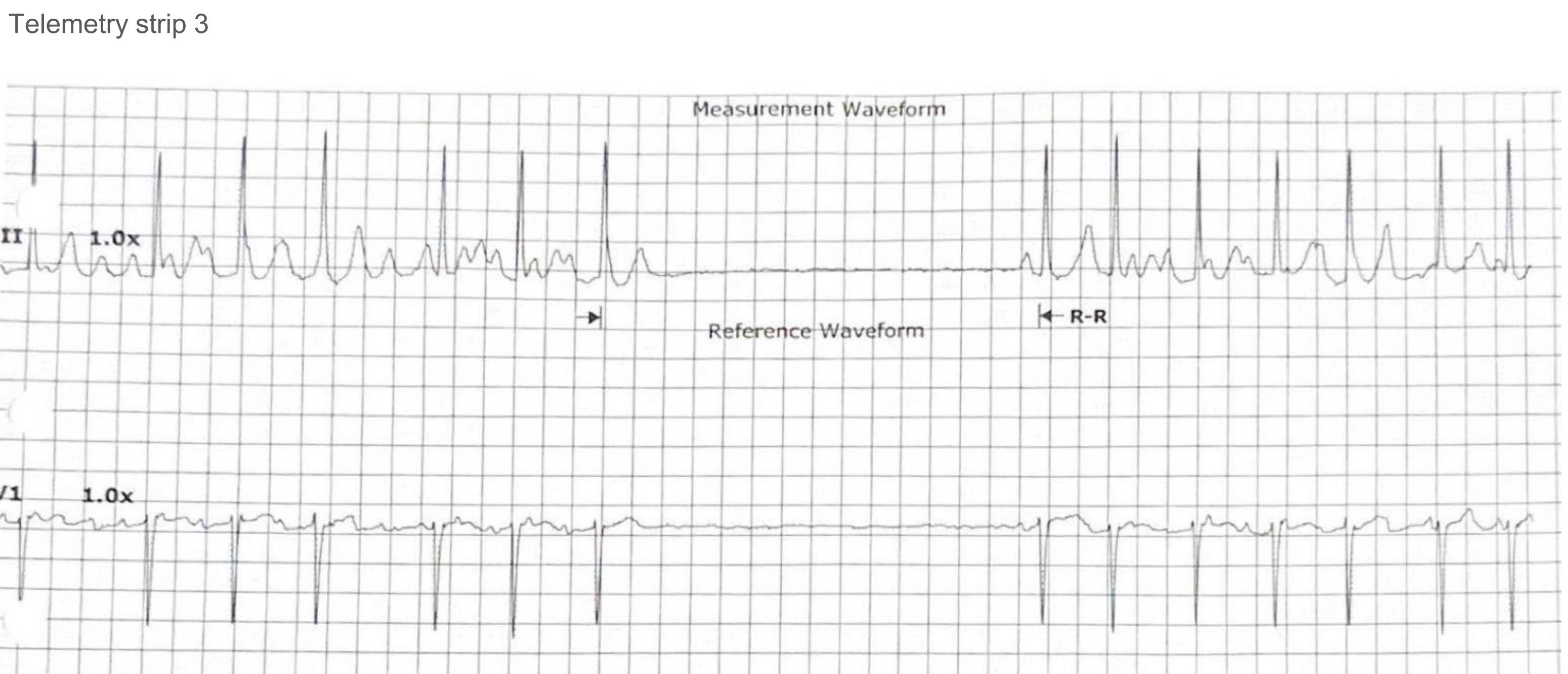
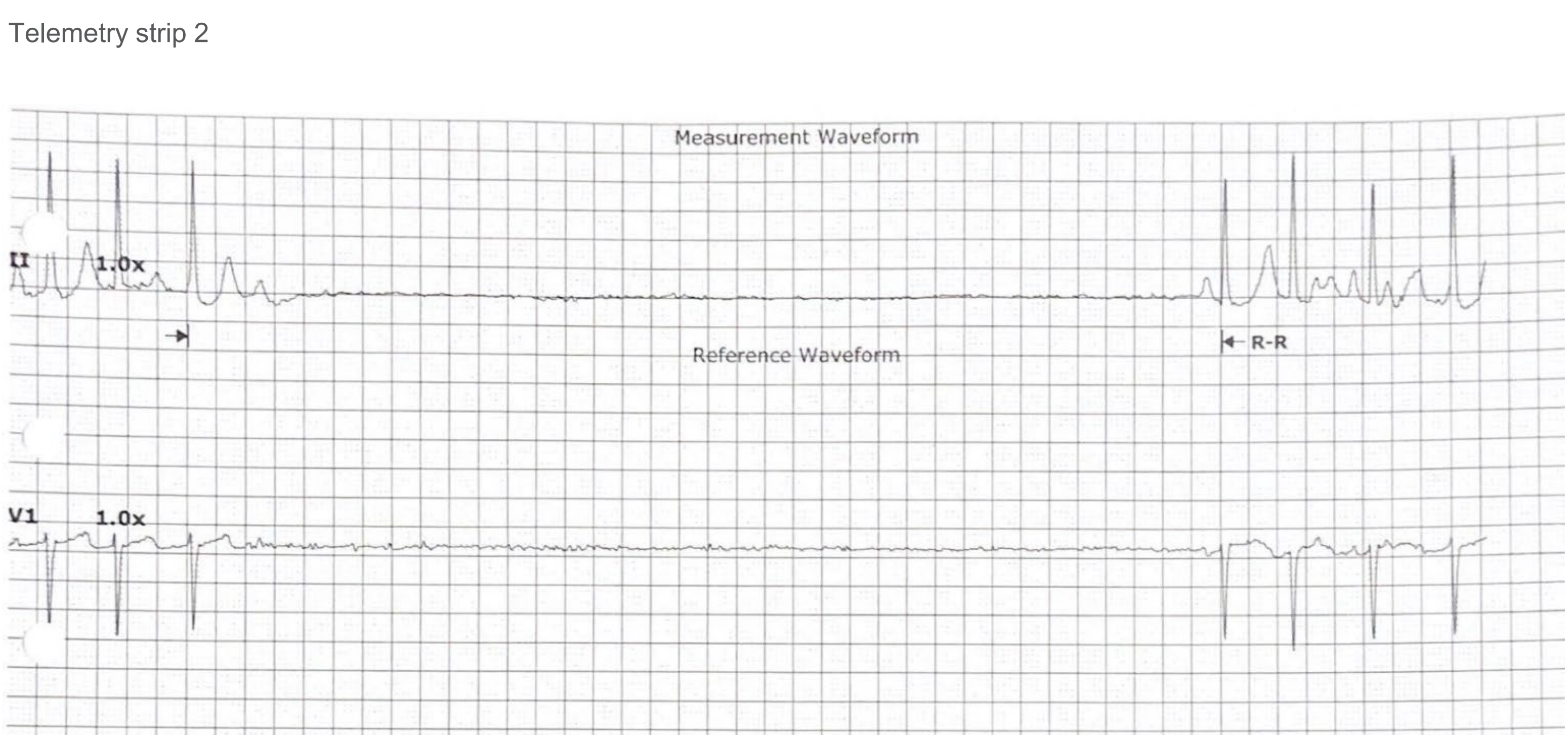
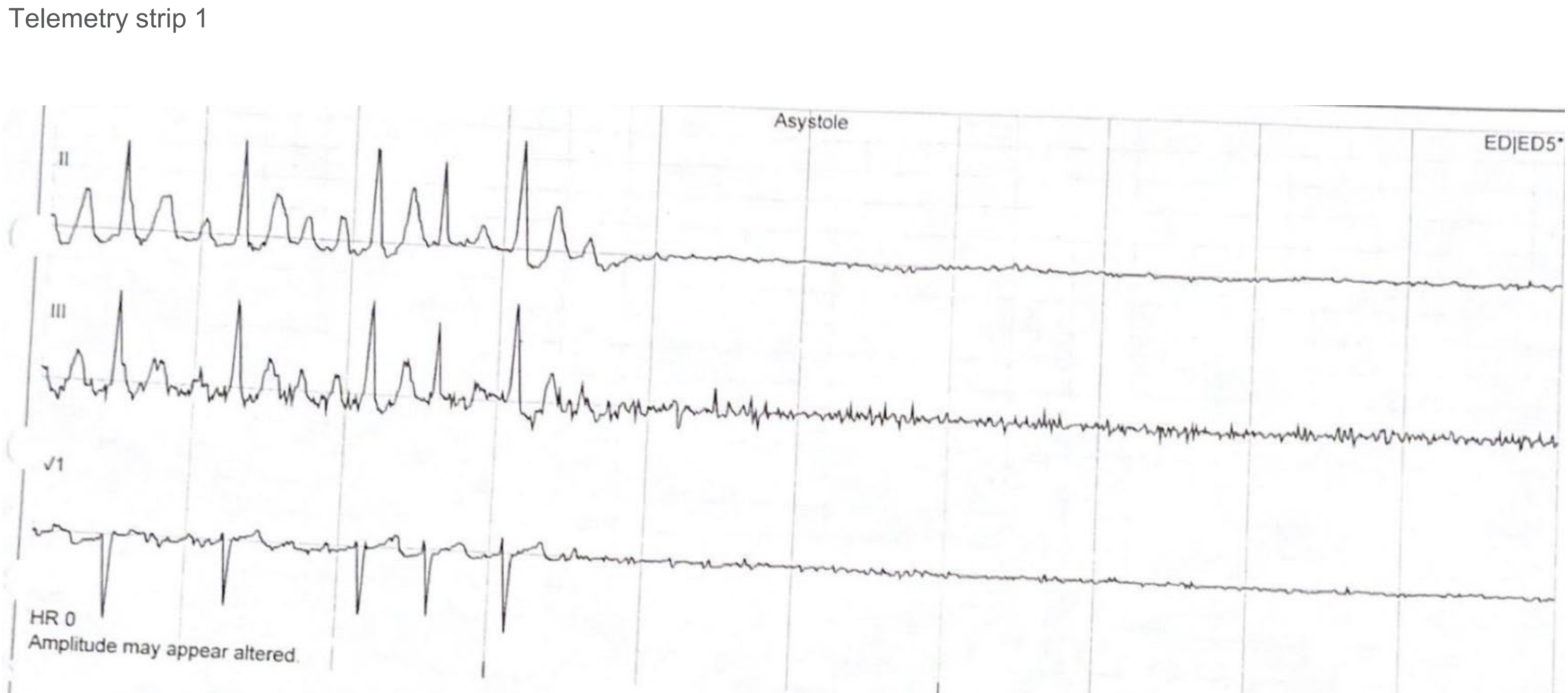
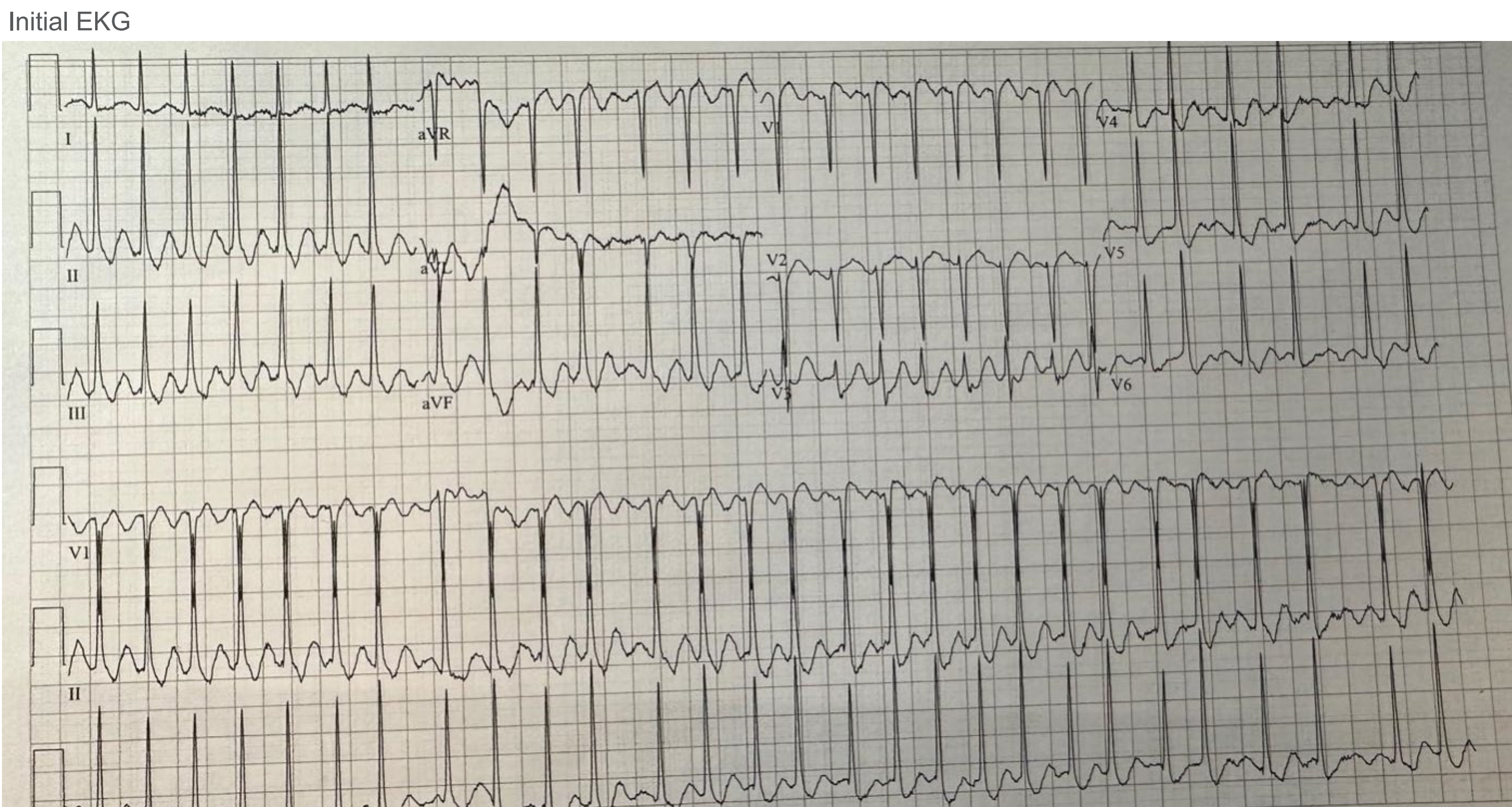
Case

The patient is a 52-year-old female, with a past medical history marked by paroxysmal atrial fibrillation and recurrent palpitations. The precipitating factors leading to her presentation in the Emergency Department (ED) were palpitations and chest pain. Her vital signs were as follows: BP: 132/78, P: 190, O2 sat: 95% on RA, T: 99F, RR: 20. The physical examination, though largely unremarkable, did reveal the patient in moderate distress accompanied by diaphoresis.

The initial electrocardiogram (EKG) revealed a rhythm consistent with atrial fibrillation with a rapid ventricular response rate of 169. Initial attempts at vagal maneuvers proved ineffectual, prompting an intervention with Metoprolol intravenously at a dosage of 5mg. Subsequent to this intervention, the heart rate mitigated to the 90s. Further management encompassed the administration of metoprolol tartrate at an oral dosage of 25mg, sustaining the patient's atrial fibrillation with a heart rate below 100 bpm. The patient felt significantly improved after the treatment to reduce her rate. She was no longer tachycardic, diaphoretic, nor tachypneic.

Following admission for comprehensive management while the patient remained held in the Emergency Department, an intriguing development transpired during telemetry monitoring, capturing a notable 7-second sinus pause [Telemetry strip 1]. The inpatient observation period spanning two days elucidated a series of sinus pauses, fluctuating in duration from 3 to 12 seconds [Telemetry strip 2-3]. In response to these findings, cardiology consultation ensued, culminating in the implantation of a permanent pacemaker. Subsequently, the patient was discharged having achieved resolution of all dysrhythmic symptoms. This case underscores the intricate nature of dysrhythmias and the imperative role of specialized interventions in their nuanced management.

Results



Discussion

The occurrence of sinus pauses within the confines of the Emergency Department (ED) elicits a sense of apprehension, impacting both the patient and the clinicians alike. In light of the prevailing practice of extended retention of admitted patients in EDs, instances of this phenomenon may be more recurrent in contemporary medical settings. This case report contributes to enhancing the familiarity of ED physicians with the intricacies of sinus pause management.

Cardiologically oriented literature corroborates the notion that sinus pause is an anticipated finding in the context of atrial fibrillation [Ferrer, 1973]. From a physiological standpoint, the heart's endeavor to revert to sinus rhythm engenders a sinus pause or other manifestations of sinus node dysfunction [Nattel, 2002].

The initial approach to managing sinus pause in the ED necessitates a judicious deployment of supportive measures, encompassing supplemental oxygen administration if deemed necessary, establishment of intravenous access, continuous cardiac monitoring, and the strategic application of transcutaneous pacemaker pads [Ferrer, 1973]. The subsequent evaluation pivots on the critical determination of the patient's hemodynamic stability. For those categorized as unstable, adherence to the Advanced Cardiovascular Life Support (ACLS) bradycardia algorithm becomes imperative. In the case of stable patients, exemplified by the subject of this report, a meticulous exploration of potentially reversible causes becomes paramount [Allessie, 1998]. Predominant among these causes are medications (such as calcium channel blockers, beta blockers, and digoxin), ischemia, and autonomic imbalance [Ferrer, 1968]. Noteworthy is the absence of discernible benefits associated with pharmacotherapy for sinus pause, prompting a paradigm shift toward the consideration of permanent pacemaker placement for enduring and definitive management of this clinical entity [Allessie, 1998].

Conclusion

- Intervention upon sinus pause within the ED setting is effectively formed by literature review and collaboration with cardiology. The structured protocol delineated below serves as a comprehensive guide for navigating such clinical scenarios:
- Primary Assessment and Supportive Measures: Commence with a systematic primary assessment and the immediate implementation of supportive measures.
- Transcutaneous Pacemaker Pads Placement: Swiftly apply transcutaneous pacemaker pads to facilitate optimal cardiac monitoring and intervention.
- Hemodynamic Stability Evaluation: Differentiate between hemodynamically stable and unstable patients through meticulous evaluation.
- Unstable Patients: In cases of instability, adhere to the Advanced Cardiovascular Life Support (ACLS) bradycardia algorithm, ensuring a resolute and evidence-based approach [Allessie, 1998].
- Stable Patients: For stable patients, embark on a thorough exploration of potential reversible causes, emphasizing a meticulous diagnostic process [Nattel, 2002].
- Long-term Management Considerations: Deliberate the imperative of long-term management, with a strategic inclination towards the judicious placement of a permanent pacemaker. This decision aligns with the trajectory of sustained patient well-being and optimal clinical outcomes [Allessie, 1998].

References

1. Ferrer M. I. (1973). The sick sinus syndrome. *Circulation*, 47(3), 635–641. <https://doi.org/10.1161/01.cir.47.3.635>
2. Ferrer M. I. (1968). The sick sinus syndrome in atrial disease. *JAMA*, 208(3), 645–646.
3. Nattel S. (2002). New ideas about atrial fibrillation 50 years on. *Nature*, 415(6868), 219–226. <https://doi.org/10.1038/415219a>
4. Allessie M. A. (1998). Atrial electrophysiologic remodeling: another vicious circle?. *Journal of cardiovascular electrophysiology*, 9(12), 1378–1393. <https://doi.org/10.1111/j.1540-8167.1998.tb00114.x>

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