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RESEARCH ARTICLE

WELLENS SYNDROME:RECOGNIZE EARLY TO AVOID LIFE THREATENING CATASTROPHE

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Abstract

Wellens syndrome is an electrocardiographic pattern involving T waves in precordial leads in a group of patients presenting with unstable angina suggestive of critical stenosis of the proximal left anterior descending coronary artery (LAD).It is very crucial for attending physicians to be able to recognize these patterns because failure to do so can lead to life threatening catastrophe and devastating outcome.Here we report a case of a type A wellens syndrome with subtle T wave changes that went unnoticed during the initial assessment and led to anterior wall myocardial infarction.

Introduction:-

Wellens syndrome, first described in 1982, de-zwaan et al(1) identified a unique electrocardiographic(ECG) pattern in a subgroup of patients with unstable angina who had stenosis of proximal left anterior descending artery(LAD). Two different types of ECG patterns are described. The first pattern type –A is less common, however more specific, and presents as biphasic T-waves mainly in precordial leads V2 and V3, contrary to that, the second pattern type-B is more common, less specific, easier to recognize, and is characterized by deep,symmetrically inverted T waves in anterior leads(1-2). The ability to recognize both theses patterns,especially type A, is extremely important, as the ECG changes can be subtle and easily overlooked , which may lead to fatal outcomes.(3). In our case a young male patient presenting with a very subtle type –A wellens ECG pattern that went unnoticed during the initial assessment.

Case Report:

A 31-year-old male presented to emergency department of our hospital with a one week history of intermittent chest pain radiating to his back and his jaw with associated diaphoresis lasting for few minutes with spontaneous resolution. He didn't have any risk factors for coronary artery disease except for occasional smoking. The patient did not have any significant past medical history. His physical examination was unremarkable .Electrocardiogram (ECG) at presentation (Figure 1) showed very subtle terminal T wave inversions in lead V1 to V3 that was interpreted by the consulting physician as "non-specific T wave changes". Initial cardiac biomarkers were in normal limit. Trans thoracic echocardiography was performed which revealed no wall motion abnormality and estimated ejection fraction of 55%. Patient advised for a treadmill stress test by attending physician. The patient underwent treadmill stress testing, during the test he became symptomatic and complaining of severe retrosternal chest pain and developed ST segment elevation in anterior leads. (Figure 2) Thus the test was stopped prematurely. Patient shifted to cardiac intensive care immediately. Loading dose of anti-platelets in form of asprin and ticagrelor was given. Patient taken to catheterization laboratory for emergency coronary angiography which showed 90% stenosis in the proximal Left anterior descending artery (LAD)(Figure3A) that was successfully treated with a 3.0x18mm Drug-Eluting Stent (DES)(Figure 3B).The patient was discharged on optimal medical therapy.

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Discussion:-

The interpretation of the electrocardiogram(ECG) is usually the first step in evaluating patients with suspected myocardial ischemia after obtaining a medical history and performing a detailed physical examination. Thus, it is essential to be able to recognize any ECG pattern suggestive of impending myocardial infarction in order to appropriately manage the situation in timely manner. Wellens syndrome is considered a pre-myocardial infarction state that is associated with critical stenosis in proximal LAD artery. It was initially described by wellens and his colleagues in their two original studies published in 1982 and 1989(1-2). Wellens ECG pattern were apparent in 26 out of 145(18%), and in 180 out of 1260(14%) patients admitted for unstable angina in the first and second original study, respectively(1-2).It was noted that 100% of these patients had LAD lesions, with subsequent development of extensive anterior wall myocardial infarctions among 75% of patients who did not receive coronary revascularization.(1)

The diagnostic criteria of wellens syndrome include a history of intermittent chest pain, absent or minimal elevation of cardiac enzymes, and ECG findings of isoelectric or minimally elevated (<1mm) ST segment, absence of pathological precordial Q waves, biphasic or symmetrically deep inverted T waves primarily in lead V2 and V3.(3-4) More specifically, wellens syndrome can be classified in to 2 types. Type-A wellens constitutes roughly 24% of cases and identified by biphasic T waves in lead V2 and V3.(5).Such T wave inversions are recognized by distinctive upsloping followed by a sharp downslope pattern, which is noticeably different from T wave inversions of other etiologies. The more common type-B wellens accounts for the remaining 76% of cases and is identified by deep, symmetrically inverted T waves in precordial leads V2 to V5.(3)

Wellens syndrome is a early sign of pre-infarction LAD stenosis and early recognition of these pattern is imperative in order to rule out or treat any critical LAD stenosis in a timely manner before extensive anterior wall myocardial infarction develops. Provocation of cardiac ischemia in these patients by a treadmill stress testshould be avoided because it can lead to adverse events such as ST segment elevation(3,6) as well as fatal outcomes secondary to induction of ventricular tachycardia and severe left ventricular dysfunction.(3).

Our case hightlights the importance of early recognition of wellens syndrome which presented with only subtle ECG changes, making it easily overseen. Our patient's ECG changes were subtle enough to go unnoticed by emergency department physician and labelled as non-specific T wave changes and advised him for treadmill stress test, which may have resulted in catastrophic outcome such as serious ventricular arrhythmias, acute myocardial infarction and death.

We believe that the recognition of even the most subtle ECG changes along with early intervention may prevent significant morbidity and mortality, and for this reason it is important to remind the physicians for this syndrome.

Figure Legends:

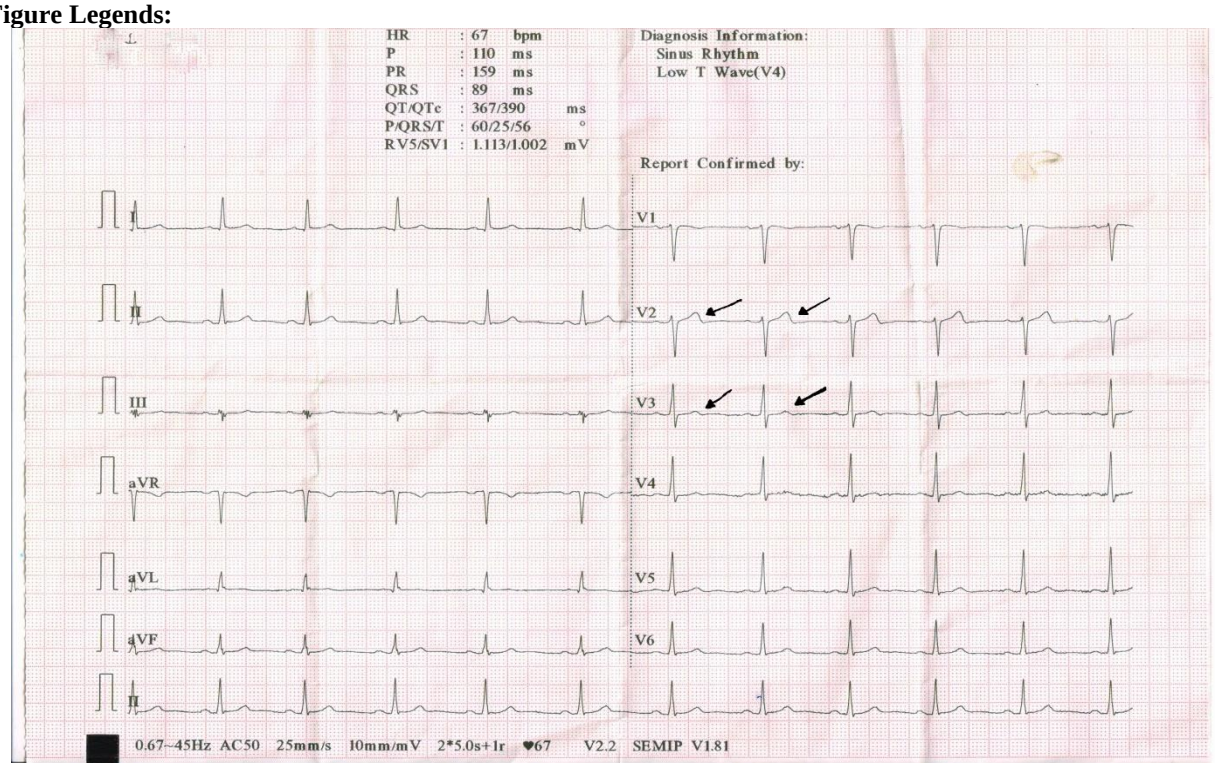

Figure 1:- Electrocardiogram at presentation showing subtle bi-phasic T-waves in lead V2-V3.

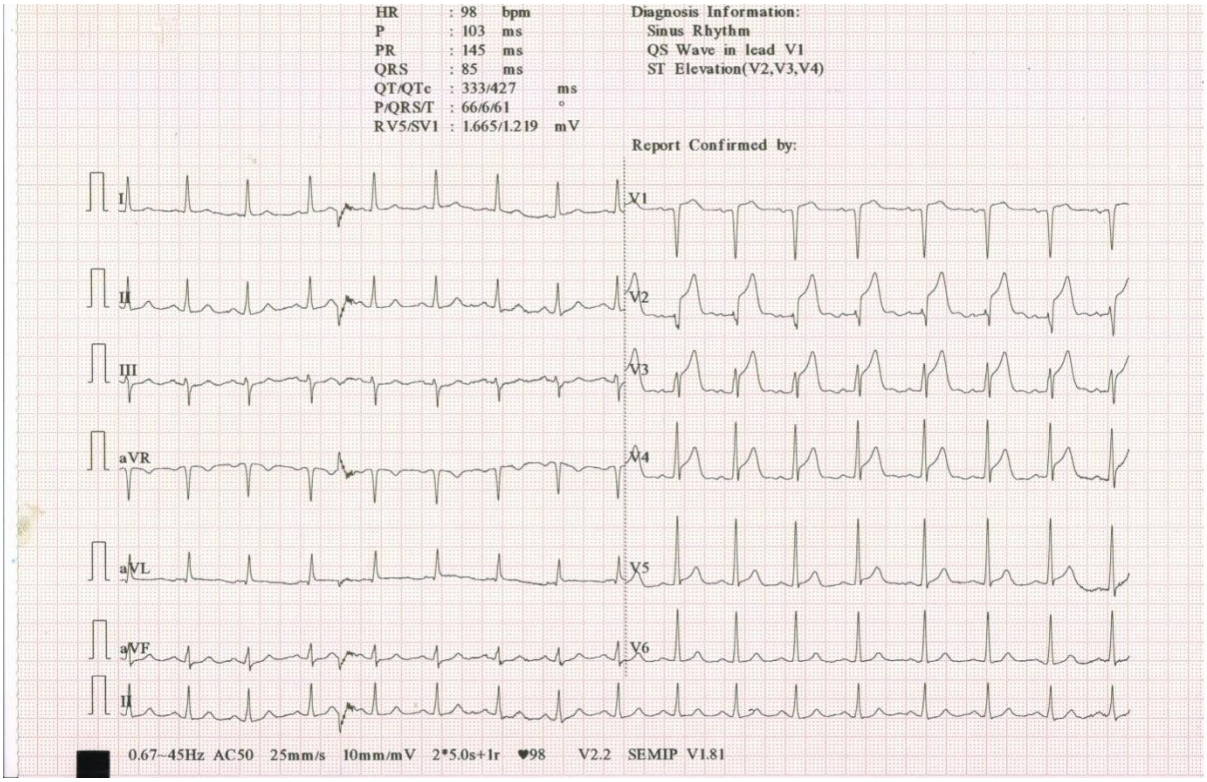

Figure 2:- Electrocardiogram after termination of treadmill stress test due to severe chest pain, showing ST-segment elevation in anterior leads.

Figure 3(a):- Coronary angiogram showing critical stenosis in proximal left anterior descending artery (LAD).

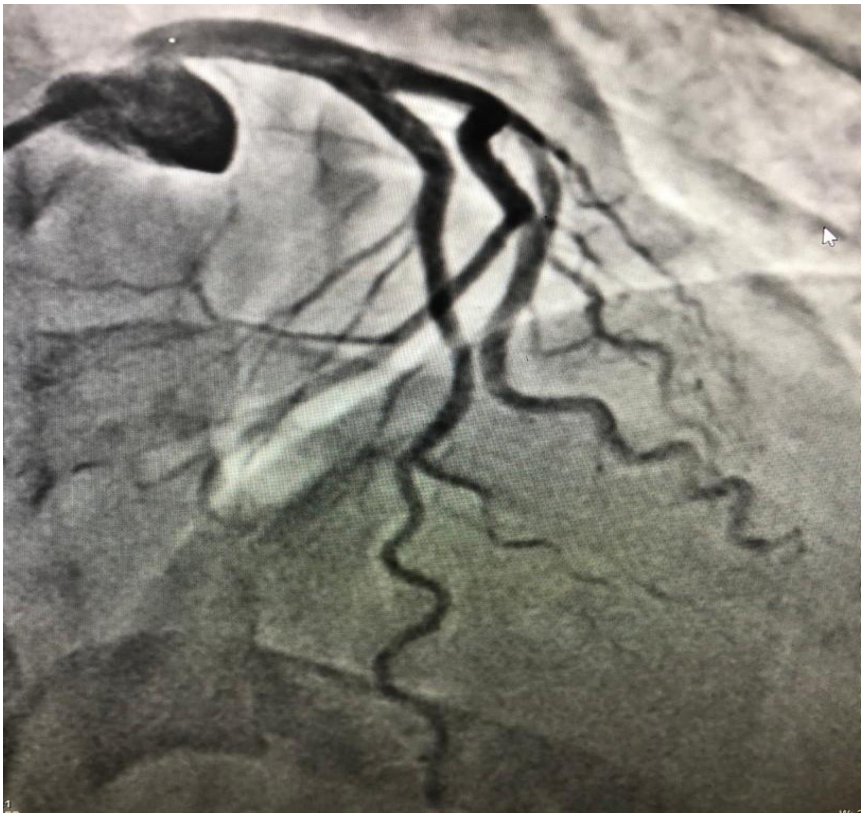

Figure 3(b):- Coronary angiogram after successful deployment of drug-eluting stent in proximal left anterior descending artery (LAD).

Conclusion:-

Type A wellens syndrome, which is a rare ECG pattern that suggests severe proximal LAD stenosis. These ECG findings in form of terminal T wave inversions or biphasic T waves in lead V2-V3 can be very subtle and are often interpreted as non-specific T wave changes both by the computer and by attending physician, which makes this type of wellens syndrome easily overseen. So the recognition of these ECG changes by the primary physician is crucial as early intervention may prevent significant morbidity and mortality.

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