Medical management strategy for Wellens' syndrome type B presentation in the elderly

Ismail Sooltan[1] and Sudantha Bulugahapitiya[1]

[1]Affiliation not available

October 2, 2023

Abstract

Wellens' syndrome is predefined electrocardiographic (ECG) criteria associated with critical, proximal left anterior descending (LAD) coronary artery stenosis. Wellens' syndrome represents a pre-infarction state. Patients are therefore at high risk of an extensive anterior myocardial infarction. It is critical for physicians to identify the subtle ECG signs for Wellens' syndrome when managing patients with acute cardiac sounding chest pain.

This case describes a 94-year-old female who presented to the Same Day Emergency Centre with bilateral jaw pain and mild chest discomfort. Her admission Troponin T was normal, but the 12-lead electrocardiogram on revealed a Wellens' pattern B. The patient was treated conservatively for acute coronary care syndrome and was discharged in good condition.

Keywords : Electrocardiography, Cardiology, Geriatric medicine, Wellens' syndrome, Acute coronary syndrome

Case report

A 94-year-old female presented to Same Day Emergency Centre (SDEC) after experiencing approximately 10 minutes of sudden onset central chest pain radiating to her left jaw. She denied any dyspnoea, lightheadiness, loss of consciousness, vision changes, nausea / vomiting, abdominal or back pain. Her medical history includes atrial fibrillation, hypertension, chronic kidney disease stage III, type two diabetes mellitus, benign paroxysmal position vertigo, anxiety and frailty. The patient's home medications included Apixaban, Bisoprolol, Calci-D, Folic acid, Lansoprazole and Zopiclone. The patient had recently moved into a care home, but remains mostly independent. The patient walks unaided with an exercise tolerance of approximately 100 yards. She is a non-smoker and drinks minimal alcohol.

On arrival to SDEC, the patient was experiencing mild chest discomfort. Her oxygen saturation was 100% on ambient air, respiratory rate 18, heart rate 61 bpm, blood pressure 179/67 mmHg and apyrexic (36.1 degrees Celsius). The patient was corpus mentis. The physical examination was mostly unremarkable, apart from a non-radiating systolic murmur heard loudest in the aortic region.

The 12-lead ECG on presentation had a rate of 66 bpm, irregularly-irregular rhythm, normal axis (+35 degrees), no p-waves, QRS 92ms, deeply symmetrical T-wave inversions in leads I & V1-V5 consistent with a Wellens' pattern B, and a QTc 496ms. This was compared against an old ECG from November 2022 which had a heart rate of 60 bpm, irregularly-irregular rhythm, normal axis (+40 degrees), no p-waves, QRS 80ms and QTc 416ms.

The initial troponin T was 34.6 ng/L but within normal limits (normal reference < 37 ng/L). D-dimer was normal at 276 ng/mL (age-adjusted cut-off 470 ng/mL). The creatinine was 156 umol/L (at baseline), with an estimated glomerular filtration rate of 33 mL/min/1.73m^2.

A focused bedside echocardiogram showed reasonable RV function, with mild LV impairment with akinesis of antero-septum, apex and distal anterior wall. IVC patent.

The geriatrics team were keen for the patient to be for percutaneous coronary intervention (PCI) over medical management due to the patient's reasonable functional status. The patient was willing to have PCI if deemed absolutely necessary, but preferred medical management. However, due to the serious risk of contrast induced nephropathy[1,2], the cardiology team ruled out PCI and opted for medical management of acute coronary syndrome. The cardiology team also recommended a short hospital admission of three days for observation.

The patient's apixaban was suspended and she subsequently was loaded with aspirin 300mg once only and clopidogrel 300mg once only and admitted to the geriatrics ward. She was then commenced on aspirin 75mg once daily (OD), clopidogrel 75mg OD, Fondaparinux 2.5mg OD and Bisoprolol 1.25mg twice daily (increased from her usual 1.25mg OD) alongside her usual medications. An angiotensin receptor blocker was not started due to the low renal function.

Throughout her hospital stay, the patient remained asymptomatic. The departmental echocardiogram prior to discharge showed good RV function, normal size LV with good systolic function, LVEF $>$ 50%, mild aortic stenosis and regurgitation. Also, the observations on discharge were stable (respiratory rate 20, 97% on ambient air, blood pressure 128/63 mmHg, heart rate 59, temperature 36.9 degrees Celsius). The patient was discharged back to her care home three days later. She was discharged with lifelong single anti-platelet therapy (clopidogrel) with apixaban and the increased dose of bisoprolol.

Discussion

Recognition of Wellens' syndrome is important, as 75-100% of patients with the ECG characteristics have significant LAD stenosis and are high risk of developing extensive anterior wall infarction within weeks.[3] The respective ECG changes for Wellens' pattern A & B have been well reported. Pattern-A which occurs in approximately 25% of cases has biphasic T waves in V2-V3.[4] Pattern-B, which occurs in approximately 75% of cases, has symmetric and deeply inverted T waves in chest leads.[5] The exact mechanism of the ECG changes still remains unknown; it is speculated it may be due to coronary artery spasm or stunned myocardium.[6]

The original study concluded patients admitted with chest pain and an ECG demonstrating the Wellens' pattern A or B, urgent coronary angiography should be performed.[7] It was originally reported these patients do poorly with conservative management.[7] We noted in the original study, of the 26 patients reviewed, the age ranged from 38 to 81 years with a mean age of 58 years old. The LAD stenosis could range from about 50% to complete occlusion. Coronary angiography was not performed in 7 patients (5 due to patient refusals and two due to age); of these patients, about 25% remained asymptomatic with medical management only.

When the significance of Wellens' pattern A & B was originally published, the complications of coronary angiography in the elderly was not well reported. However, studies have now shown common elderly coronary angiography complications include recurrent ischaemia, stroke and intracranial haemorrhage.[8-10] However, like our case, Coutinho et al reported an 83-year-old male presenting with chest pain, Wellens' pattern B, negative troponins and 64% LAD stenosis who fared well on medical therapy.[11]

Identification of Wellens' syndrome is important, as it allows aggressive therapy to be expedited to prevent an anterior MI - currently urgent coronary angiography is recommended key treatment. However, like Coutinho et al, we report a positive outcome on a symptomatic elderly patient presenting with Wellens' pattern B and treated with medical therapy only. This case hopes to raise awareness of the positive outcome with medical therapy only in elderly patients presenting with Wellens' syndrome.

References

1. Mehran R, Aymong ED, Nikolsky E, Lasic Z, Iakovou I, Fahy M, Mintz GS, Lansky AJ, Moses JW, Stone GW, Leon MB, Dangas G. A simple risk score for prediction of contrast-induced nephropathy

after percutaneous coronary intervention: development and initial validation. J Am Coll Cardiol. 2004 Oct 6;44(7):1393-9. doi: 10.1016/j.jacc.2004.06.068. PMID: 15464318.

2. Mohammed NM, Mahfouz A, Achkar K, Rafie IM, Hajar R. Contrast-induced Nephropathy. Heart Views. 2013 Jul;14(3):106-16. doi: 10.4103/1995-705X.125926. PMID: 24696755; PMCID: PMC3969626
3. Hsu YC, Hsu CW, Chen TC. Type B Wellens' syndrome: Electrocardiogram patterns that clinicians should be aware of. Ci Ji Yi Xue Za Zhi. 2017 Apr-Jun;29(2):127-128. doi: 10.4103/tcmj.tcmj_26_17. PMID: 28757781; PMCID: PMC5509195.
4. de Zwaan C, Bär FW, Wellens HJ. Characteristic electrocardiographic pattern indicating a critical stenosis high in left anterior descending coronary artery in patients admitted because of impending myocardial infarction. Am Heart J. 1982 Apr;103(4 Pt 2):730-6. doi: 10.1016/0002-8703(82)90480-x. PMID: 6121481.
5. Agarwal A, Vyas S, Kumar R. Wellen's syndrome: Challenges in diagnosis. Malays Fam Physician. 2015 Dec 31;10(3):35-7. PMID: 27570607; PMCID: PMC4992353.
6. Miner B, Grigg WS, Hart EH. Wellens Syndrome. 2022 Aug 1. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 29494097.
7. de Zwaan C, Bär FW, Wellens HJ. Characteristic electrocardiographic pattern indicating a critical stenosis high in left anterior descending coronary artery in patients admitted because of impending myocardial infarction. Am Heart J. 1982 Apr;103(4 Pt 2):730-6. doi: 10.1016/0002-8703(82)90480-x. PMID: 6121481.
8. Shanmugasundaram M. Percutaneous coronary intervention in elderly patients: is it beneficial? Tex Heart Inst J. 2011;38(4):398-403. PMID: 21841868; PMCID: PMC3147189
9. Shanmugam VB, Harper R, Meredith I, Malaiapan Y, Psaltis PJ. An overview of PCI in the very elderly. J Geriatr Cardiol. 2015 Mar;12(2):174-84. doi: 10.11909/j.issn.1671-5411.2015.02.012. PMID: 25870621; PMCID: PMC4394333.
10. Wang TY, Gutierrez A, Peterson ED. Percutaneous coronary intervention in the elderly. Nat Rev Cardiol. 2011 Feb;8(2):79-90. doi: 10.1038/nrcardio.2010.184. Epub 2010 Dec 7. PMID: 21139558.
11. Coutinho Cruz M, Luiz I, Ferreira L, Cruz Ferreira R. Wellens' Syndrome: A Bad Omen. Cardiology. 2017;137(2):100-103. doi: 10.1159/000455911. Epub 2017 Feb 15. PMID: 28196358.

Authorship statement

Ismail Sooltan : conceptualisation, writing – original draft, writing – review & editing, project administration.

Sudantha Bulugahapitiya : conceptualisation, writing – review & editing, supervision, project administration.