

Clinical Corner: Recognizing Big Trouble

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A 63 y/o male patient presents to a community ED with chest pain for 4 hours associated with diaphoresis and nausea. The patient drove himself to the ER when the pain was not relieved by Pepcid and rest. In the ED the patient complained of substernal chest pain, rating the pain 8/10. The patient was immediately triaged and given ASA 324mg and 1 Sublingual Nitroglycerine. He then reported to be pain free after the Nitroglycerine. The rest of his physical exam was normal. An ECG, performed while the patient was pain free, showed deeply inverted T waves in leads V2 to V6. The ST segments were minimally elevated in leads V2 and V3. Serum cardiac markers were drawn and came back negative for myocardial infarction. The ED physician recognized the ECG changes as consistent with Wellens' Syndrome. He has requested helicopter transport to have the patient transferred to a tertiary care center for immediate coronary angioplasty.

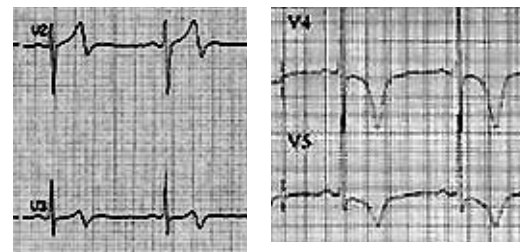
The 30-minute helicopter transport is uneventful. The patient is diagnosed with an 85% occlusion of his proximal LAD in the cardiac catheterization lab. Balloon angiography is successful. A stent is placed. The patient is discharged after two days of observation.

DISCUSSION

H. J. J. Wellens described a characteristic pattern of changes on the ECG that is associated with critical stenosis of the proximal left anterior descending coronary artery. The ECG changes usually occur during a pain-free interval when other evidence of AMI or cardiac ischemia is not present. These patients are at great risk for developing an extensive anterior wall myocardial infarction if not treated aggressively. Early identification of patients who present with anginal type chest pain with Wellens' Syndrome criteria on their 12 lead ECG is important to decrease morbidity and mortality.

In 1982 Wellens and colleagues published the original clinical criteria for what has become known as Wellens' Syndrome. They originally reported these ECG changes were not uncommon. In the original study group 26 of 145 (18%) patients admitted with unstable angina showed this pattern of ECG changes¹. A prospective study was done that showed 180 of 1,260 patients (14%) showed ECG changes with Wellens' Syndrome². All 180 with ECG changes received coronary angiography and were found to have blockages in their left anterior descending that varied from 50% to complete blockages. Wellens originally believed that as many as 75% of patients developed an anterior wall myocardial infarction within days despite relief of chest pain. This finding by Wellens was corroborated by Haines, et al in 1983. Only 12% of the original study group with ECG changes had minimally elevated cardiac enzymes.

The original criteria as described by Wellens and colleagues, includes significant alterations to the T wave with only occasional alterations of the ST segment. T wave findings may take the form of two specific patterns. In 75% of cases, the T wave is deeply inverted (see figure 1). The less common presentation, 25% of cases, is biphasic T waves (see figure 2). A minimally elevated (1mm or less) ST Segment with convex morphology that leads into a negative T wave is the less common presentation. This presentation is most commonly seen in leads V2 and V3. Changes may also be seen in V1 and V4. ECG changes meeting Wellens criteria often develop when the patient is free of anginal type pains. Typically, during periods of chest pain the T wave changes are replaced with positive T waves and ST elevation or depression.



CONCLUSION

Wellens' Syndrome is known as a pre-infarction stage of coronary artery disease. Early identification of Wellens' Syndrome allows the patient to receive rapid, aggressive interventional therapy. It also allows for the prevention of conservative management that may lead to a negative outcome for the patient. Many of the patients that present with Wellens' Syndrome will develop an extensive anterior wall myocardial infarction within days of the initial presentation. Conservative therapy may lead to the patient receiving an exercise stress test. Exercise stress tests can have devastating consequences for the patient and should be avoided in patients with suspected left main or left anterior descending lesions. A patient with Wellens' Syndrome may be destined for a massive myocardial infarction if not identified and treated appropriately.

References

1. de Zwann C, Bar FW, Wellens HJJ: 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; 103:4:730-736
2. de Zwann C, Bar FW, Janssen JH, et al: Angiographic and clinical characteristics of patients with unstable angina showing an ECG pattern indicating critical narrowing of the proximal LAD coronary artery. *Am Heart J* 1989; 117:3:657-665
3. Haines DE, Raabe DS, Gundel WD, et al: Anatomic and prognostic significance of new T-wave inversion in unstable angina. *AM J Cardiol* 1983; 52:14-18
4. Tandy TK, Bottomy DP, Lewis JG: Wellens' syndrome. *Ann Emerg Med* March 1999; 33:347-351



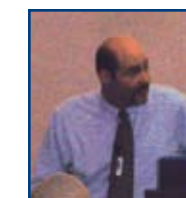
JeffSTAT Hosts OB STAT Course

The care of high risk OB patients and newborns can be complicated in the transport environment. The need for high risk OB transport has increased over the years as fewer hospitals provide OB services. JeffSTAT recently hosted a specialized OB training program called "OB STAT" at its main office in Philadelphia to enhance the knowledge base of its transport nurses and paramedics. JeffSTAT is one of few programs in the northeast that is capable of conducting fetal monitoring in an ambulance or in a helicopter. This sixteen hour training program was taught by Pamela Adams, RN, a nurse with 25 years experience in high risk OB care in the transport environment. Topics covered included fetal assessment and surveillance, fetal monitor strip interpretation, assessment of the pregnant patient, emergency childbirth, complicated deliveries, tocolytics, and how to manage patients with pre-term labor, eclampsia, and other OB emergencies.

JeffSTAT Begins Transition to Electronic Patient Charting

After many months of technology adjustments, implementation and staff training JeffSTAT has begun using their new Zoll Data Systems "Tablet PCR" patient care electronic medical record computers. The Tablet program allows JeffSTAT clinical providers the freedom of portability with notebook style computers and touchscreen data entry. JeffSTAT's Paramedics and Nurses began using the new system in August while the EMTs are being trained for implementation this fall. The program links with dispatch information and then uploads the patient record to JeffSTAT servers for internal processing and billing. A supplemental interface between the JeffSTAT Tablet PCR program and the Thomas Jefferson University Hospital is being developed to import the transport record into the patients' medical record. On screen signatures, real-time import of critical vital signs from patient monitors and clinical systems documentation are a few of the technology enhancements this product offers. We hope to have the system fully implemented by Spring 2008.

JeffSTAT Personnel Present at National Air Medical Transport Conference (AMTC)



The 2007 Air Medical Transport Conference was held in Tampa, Florida September 17th to the 19th. This educational conference attracts over 2,500 physicians, nurses, paramedics, dispatchers, pilots, and administrators from transport programs around the world. Four presentations from JeffSTAT personnel were accepted at the conference.

Steven Bastian, Critical Care Transport Nurse, presented "Crew Personal Survival Kits." He discussed what flight personnel should carry in their pockets to help aide survival following an unplanned landing or other emergency situation. Matthew Cathcart, Clinical Education Coordinator, presented "Brugata, Wellens, and all the Unusual Subjects." He discussed the care and treatment of some lesser known cardiac diseases that he has encountered during transport which are often misdiagnosed. Matt and Steve teamed up to present "Neurological Nightmares; A Transport Team's Experience." Here they reviewed six interesting neurosurgical cases they have encountered as partners at JeffSTAT and discussed the current treatment of patients with subarachnoid hemorrhage. Duane Spencer, Operations Manager, presented "Benchmarking 201." He gave attendees guidance on how to establish an internal benchmarking program and provided suggestions on what to monitor to assess organizational performance.



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Air and Ground Critical Care Transport to Any Delaware Valley Hospital.

If you would like to submit articles for the JeffSTAT Journal please contact John Rousis at 215-503-9280 or john.rousis@jeffersonhospital.org

December 8, December 9

PHTLS:

January 15, 2008 (9 consecutive Tuesdays)

Program (PHRN):

Pre-Hospital Registered Nurse Training

November 1

PALS for EMT-B:

December 21

PALS Instructor:

October 8/9, October 22/23, October 24,

November 13, December 17

PALS Recertification:

November 13/14, December 17/18

October 22/23, October 24/25,

PALS Initial:

November 15, December 4

October 2, October 11, November 6,

EKG Interpretation:

October 29, November 19, January 14

Emergency Medical Technician (EMT):

November 26/27

ACLS Instructor:

November 28/29, December 10, December 26

October 26, November 20, November 19/20,

ACLS Recertification:

December 19/20

November 28/29, December 10/11

November 7/8, November 19/20,

ACLS Initial:

215-955-7534 for more information.

Visit www.jeffersonhospital.org/jeffstat

for locations, times, and registration or call

Upcoming 2007/2008 Educational Programs




JeffSTAT JOURNAL

A newsletter for JeffSTAT's customers and partners in air and ground critical care transport.

FALL 2007

JeffSTAT Provides EMS coverage for Commerce Bank Triple Crown of Cycling-Philadelphia International Championship



JeffSTAT provided emergency medical coverage for this years Cycling Championship held on June 10th. Seven ambulances were stationed through out the course which covered the Benjamin Franklin Parkway, through Lincoln Drive, and into Roxborough. A medical tent staffed by JeffSTAT's EMS personnel and Jefferson Hospital Emergency Department Physicians was based on the Parkway near the start/finish line to treat any injuries that may have occurred to the spectators and riders. Multiple patients were seen during the course of the event. Two minor injuries were transported after a crash occurred during the final stage of the race.

JeffSTAT provides special event coverage at large and small events. Please feel free to contact us at 215-503-9280 to schedule a special event.

New Base Opens At Methodist Hospital

JeffSTAT opened a new base at Methodist Hospital on April 23, 2007 to help expedite emergency transfers from their emergency department to tertiary care facilities in Philadelphia. A critical care transport team is now based at the Hospital twenty four hours a day, seven days a week. There has been an increased need to transfer patients for neurosurgery, trauma, pediatric, and cardiology services as

the volume of patients in Methodist's emergency department has increased. This new resource will be especially beneficial to patients who have an acute myocardial infarction and need rapid transport to an interventional cardiac catheterization lab so balloon inflation can occur within ninety minutes. It was previously very difficult to meet this time window without having a dedicated critical care transport team on site.



JeffSTAT 20 based at Methodist Hospital

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