

## Student's Corner

### Become a Sherlock Homes in ECG

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**Series 4 :**

**ECG**

**“Low but High”**

This is the ECG of 65 years old diabetic lady who has undergone non-cardiac surgery recently, after an episode of seizures.

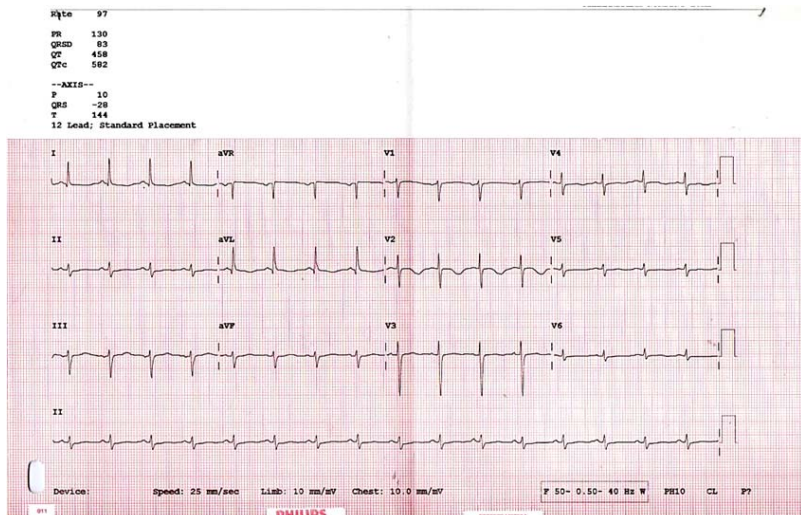
**Questions :**

1. Describe ECG changes.
2. Why is this Clue ?
3. What are Practical implications ?

**Answers :**

**(1) ECG Changes :**

This ECG shows, sinus rhythm, Minor ST T changes, left ward axis, but not typical LAFB (rs in LII) in limb leads. In chest leads, there are non-progression of R waves, significant T inversion in V2, minor ST T changes in other leads, and low voltage QRS complexes in lateral leads. The significant finding in this ECG is QT interval prolongation (QTc 582m.sec.). This ECG is after an episode of seizures in a diabetic lady. In the presence of long QTc with seizures, most often TorsadesDe Pointes (TDP) is suspected and investigation as well as treatment are planned in these lines. But, one common problem is most often not thought off. That is hypoglycemia. Hypoglycemia can produce significant ECG changes due to significant abnormalities in the heart due to hemodynamic, metabolic, vascular, autonomic and electrophysiological abnormalities. The QT interval can be significantly prolonged due to catecholamines and hypokalemia which can further lead on to TDP. So, without correcting hypoglycemia, treatment for TDP alone is not useful, but dangerous as it may not respond and may progress to VF and Cardiac arrest. This patient’s blood sugar was 20mg/dl which was corrected immediately and the ECG was taken as soon as the seizures were controlled and this showed long QTc. This patient’s pre- and post-operative ECGs did



not show long QTc. The non-progression of R wave is probably due to mal positioning of ECG leads because of abdominal surgery. The ECG changes in hypoglycemia are listed below :

*ECG changes in hypoglycemia*

- ST depression
- T flattening
- Prolonged QT
- Atrial and ventricular arrhythmias
- Primarily due to catecholamines and hypokalemia
- Probable mechanism for “**Dead In Bed Syndrome**” in young diabetics

**(2) Why is this clue ?**

This patient had low blood sugar because of which there was high QT interval (QTc prolongation). That is why the clue of “**Low but high**” is given.

**(3) Practical Implications :**

Most often in hypoglycemia, we think of brain and not the heart. As soon as patient becomes conscious, it is very important to record ECG for long QT as well as acute ischemic changes, which are most often missed and may produce life threatening events subsequently even after correction of blood sugar. So, don’t forget to record ECG after the treatment of hypoglycemia.

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