A 69-year-old female was admitted with the diagnosis of a non-ST-segment elevation myocardial infarction and placed on cardiac telemetry. Her resting ECG showed sinus rhythm and voltage criteria for left ventricular hypertrophy. A tracing was recorded by the telemetry monitor (Philips Med Systems) (Figure 1); the patient was asymptomatic. What is the mechanism for the sudden change in QRS morphology?

The telemetry tracing shows lead II (top, channel 1) and midclavicular line (MCL) (bottom, channel 2). The rhythm is a regular sinus tachycardia at 120 bpm. There is no significant lead noise or other apparent recording artefact. The QRS morphology changes abruptly (10th QRS) without any change in heart rate or rhythm. This suggested a non-physiological cause for the change in QRS morphology. Upon closer inspection it becomes apparent that the change in QRS morphology appears to be due to a switch between the recording leads. This is indeed normal behaviour for this multi-lead Philips telemetry monitoring system and is referred to as ‘fall back’ operation mode.

The user manual explains: ‘If there is a lead OFF in the primary lead (channel 1) for >10 s, the active secondary lead (channel 2) becomes the primary lead. This is known as ‘lead fallback’. In the lead fallback, the arrhythmia system switches the leads on the display. When the lead OFF condition is corrected, the leads are switched back’.

Indeed 12 s prior to the change in QRS morphology (10th QRS), both recording leads were off (not shown). Upon reconnect the ‘lead fallback’ algorithm had already triggered a ‘lead switch’ and upon recognizing both leads as reconnected the system switched the leads back to its original display (last seven QRS complexes on telemetry strip). This is followed by relearning of the rhythm as indicated by the letter N next to the QRS complexes. There is no annotation on the display or printout alerting the observer to the ‘fall back’ mode operation.

Our case illustrates that appropriate, yet not immediately obvious, arrhythmia monitoring system behaviour can result in a potential diagnostic dilemma.