A novel miniaturized reveal LINQ insertable cardiac monitoring system, the guarding angel of your heartbeat

An arrhythmia is a problem with the rate or rhythm of the heartbeat. It means that your heart beats too quickly, too slowly, or with an irregular rhythm pattern. When the heart beats faster than normal, it is called tachycardia. When the heart beats too slowly, it is called bradycardia. The most common type of arrhythmia is atrial fibrillation, which usually causes an irregular and fast heartbeat. Many factors can affect the heart's rhythm, such as having had a heart attack, hypertension, smoking, congenital heart defects, and stress. Some substances or medicines may also cause arrhythmias. Symptoms may include palpitation, pause felling between heartbeats, or loss of consciousness (syncope), while there are also many who have no complaints.

To identify an arrhythmia requires recording the heart’s activity using an electrocardiogram (ECG). Doctors study the shape and size of the signals recorded by the ECG, and this gives information about the heart rhythm. However, conventional ECG is a passive text; it can only record an arrhythmia if it occurs spontaneously while the ECG is being taken.

If the ECG is sort of a “photograph”, then the continuous cardiac monitoring is more like a “movie” of the heart beats.

Continuous cardiac monitoring using an implanted device has been introduced into clinical practice to assist physicians in diagnosing patients with syncope, abnormal heartbeats, and for the detection of a suspected arrhythmia. Recently, the Real LINQ device was developed as a novel Insertable cardiac monitor (ICM), it has a miniaturized size (currently the smallest cardiac monitoring device), uses wireless telemetry for remote continuous monitoring of patients. These features enable a simple implantation of the device and provide good capability for the detection

and documentation of arrhythmias. Thus your doctor may recommend an appropriate management based on the device documented data.

Real LINQ cardiac monitoring system consists of three components: 1). A small Insertable Device (the “detector”, to continuously collect heart rhythm information); 2). A Patient Monitor (the “information station”, to transmit data recorded by the insertable device to your doctor); and 3). A Patient Assistant (the “remote control”, patient can press the button on it and trigger the device to record the heartbeat before, during and after the symptoms).

Fig. 2. Example of ECG reading from the Reveal LINQ device (From Pürerfellner H, et al. Heart Rhythm 2015, 12:1113-1119).

Most recently in the prospective, multicenter Reveal LINQ study assessing the usability of the LINQ monitor device (the study registered in FDA website: http://www.clinicaltrials.gov. NCT number: 01965899), we enrolled eligible patients with indication for ICM device, and evaluate the functionality of the Reveal LINQ system. The study shows that the implantation of the device is minimal invasive for the patients and quite simplified for the physician (using a specialized incision and insertion tool). The successful rate of device implantation is perfectly good. The automatic data transmission is successful in up to 80% of the time, and full data transmission can be successful completed by automated or manual transmission on a subsequent day. The data stored by the device shows a good capability for arrhythmia identification. Importantly, there are no serious complications during the study follow-up.

In conclusion, the Reveal LINQ system is functional and safe in patients who are indicated to a cardiac monitoring device. Device miniaturization in combination with technological advances may further enhance its use in daily care, and provide more benefits for the patients.

Helmut Pürerfellner, Shaojie Chen
EHRA/ESC Academic Teaching Center, Department of Cardiology,

Elisabethinen University Teaching Hospital, Linz, Austria

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