

Pacemaker and Phaco Surgery

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Can a person with a cardiac pacemaker undergo phaco surgery?- one may wonder what could be the problem.

Lets assume that you are watching a TV when someone happens to kick start a motor cycle in the vicinity; you will see irregular spots of light on the screen. Likewise when you listen to a radio on a rainy day, you may hear some noise in the radio, following the lightning. These are due to what is known as EMI (Electromagnetic interference). Any electrical disturbance, natural or man made, produces electromagnetic waves of wide range of frequencies, that the TV or radio picks up quite easily.

Similarly any electronic circuit can pick up electromagnetic radiation from electronic or electrical instruments. A pacemaker is an electronic circuit designed to produce pulses to regulate a slow or erratic heart beat. A person with pacemaker cannot undergo a Magnetic Resonance Imaging (MRI) procedure. During surgery electronic cautery is not to be used on such persons. Even cellular phone is known to interfere with the pace maker's function. Though a fully shielded, metal-cased cellular phone is safe for them, provided a safe distance between the phone and the location of the pacemaker is maintained. They should not be subjected to examination with the usual metal detector system used in airports. In our hospital they are not permitted to enter the LASIK room. All these are understandable because the high frequency

electromagnetic radiation from those instruments can interfere with the functioning of the pacemaker circuit.

For a question on a phaco surgery for such patient, the immediate response would be 'why not?' In a phaco surgery the energy used is ultrasonic (sound) energy and the pacemaker circuit should not respond to sound energy. The argument is very strong but there is one problem; ultrasonic power required for phaco is produced using electronic circuit and if the instrument is not properly shielded there could be some electromagnetic radiation which could be picked up by the pacemaker. The electromagnetic wave follows the inverse square law. As the distance is doubled, the intensity reduces to one-fourth. The location (distance) of the phaco unit with respect to the patient becomes important; greater the distance, lesser is the intensity of the EMI. The phaco unit could be located on the head side or on the right side of the patient at a distance of not less than 60 cm (about 2 feet). With this precaution and with a continuous monitoring of the patient by a Physician, during the progress of the surgery it should be possible to give the benefit of phaco surgery to patients with pacemaker. Some ophthalmologists in other parts of the world with whom we have interacted are doing phaco on such patients.

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