IJCRR
Vol 05 issue 24
Section: Healthcare
Category: Research
Received on: 14/11/13
Revised on: 12/12/13
Accepted on: 20/12/13

MICROCHIP INSERTION IN HUMAN BEINGS – A NEW IDENTIFICATION TOOL

Ajay Kumar S.[1] , Manjula Bai K. H.[2], D.R.Mahadeshwara Prasad[3], Nagesh C. Kuppast[4], Chandan V.[1], Sidramappa Gouda[1]

[1]Dept. of Forensic Medicine and Toxicology, Basaweshwara Medical College, Chitradurga, Karnataka, India
[2]Dept. of Forensic Medicine and Toxicology, J.N. Medical College, Belgaum, Karnataka, India
[3]Dept. of Forensic Medicine and Toxicology, District Hospital, Chamarajanagar, Karnataka
[4]Dept. of Forensic Medicine and Toxicology, S. S. Institute of Medical Sciences and Research Centre, Davangere, Karnataka.

E-mail of Corresponding Author: ajayhospet@gmail.com

ABSTRACT

During mass disasters, victim identification is one of the great challenges for the investigating teams especially in case of most markedly putrefied and partially skeletonised bodies. In these cases an adequate body tagging method is essential. Conventional body bag tagging in terms of writing on body bags and placing of tags inside body bags was not satisfactory and consequences of cold storage, embalming and body numbers inside storage facilities may raise problems. The placement of sub dermal implant of Radio Frequency Identification Device (RFID) microchips in human beings which contains a unique ID number that can be linked to information contained in an external database, such as personal identification, medical history, medications, allergies, and contact information. This is also useful to find lost children or confused Alzheimer's patients, or to determine if job applicants are illegal immigrants or criminals as well as victims in major accidents or mass disasters.

Keywords: Micro-chip, Sub dermal implant, Identification, Mass disaster.

INTRODUCTION

RFID technology was introduced in the beginnings of WWII to identify the Allied airplanes. Since then, RFID technology was used for multiple purposes, mainly to track nuclear materials as well animals etc. A RFID chip is a microchip that transmits a static identifier or serial number for a short distance[1]. More improvised microchip devices are available for identifying stray animals and these implants are about the size of a grain of rice, have been a great boon for the owners with lost or stolen pets. Implantation of more than six million has been reported. Recovering a lost animal is greatly increased and a wandering can quickly be scanned. The animal's owner can be easily identified if it has a microchip[2]. Many researches have been done to help the people medically with this technology. This technology is being used to implant people with microchips[1].

As early as in 1967 Alan Westin discussed the possibility of "permanent impalements of 'tagging' devices on or in the body" and he also stated that if the technology were extended to human beings, a lot of identification related applications, such as the capability to find confused Alzheimer's patients or lost children, or criminals or to determine if job applicants are illegal immigrants could have been envisaged [2].

But some issues may arise with implanting microchips in people and which include the ability to track a person's exact location, legal and privacy concerns, their purchasing habits, as well as hacking their information about personal and financial matters.

Historical Aspects

In 1998 the first reported experiment with an RFID implant was carried out by the British scientist Kevin Warwick. As a test, his implant was used to open doors, switch on lights, and cause verbal output within a building. After this, several additional hobbyists have placed RFID microchip implants into their different parts of the body or had them placed there by others. Author of the book "RFID Toys" Amal Graafstra asked doctors to place implants in his hands. A scalpel was used by a cosmetic surgeon to place a microchip in his left hand, and using a veterinary Avid injector kit doctor injected a chip into his right hand. Graafstra used the implants to open his home and car doors and to log on to his computer[4]. Mikey Sklar had a chip implanted into his left hand and filmed the procedure along with that he did number of personal interviews about his experience of being microchipped[5].

Procedure and details of biochip implant[6]

The newly available biochip implant is basically a small (micro) computer chip (Fig 1), inserted under the skin, for multiple purposes. The biochip implant system consists of two components; a transponder and a reader or scanner. The transponder is the actual biochip implant. The biochip system is radio frequency identification (RFID) system, using low-frequency radio signals to communicate between the biochip and reader. The reading range or activation range, between reader and biochip is small, normally between 2 and 12 inches. The two Components are (Fig 2)

1) **The transponder:** The transponder is the actual biochip implant. Transponder is of two types, a passive transponder, meaning it contains no battery or energy of its own. In comparison, an active transponder would provide its own energy source, normally a small battery. Because the passive biochip contains no battery, or nothing to wear out, it has a very long life, up to 99 years, and no maintenance. Being passive, it's inactive until the reader activates it by sending it a low-power electrical charge. The reader "reads" or "scans" the implanted biochip and receives back data (in this case an identification number) from the biochip. The communication between biochip and reader is via low-frequency radio waves.

The biochip-transponder consists of four parts; computer microchip, antenna coil, capacitor and the glass capsule. A) Computer Microchip: The microchip stores a unique identification number from 10 to 15 digits long. The storage capacity of the current microchips is limited, capable of storing only a single ID number. AVID (American Veterinary Identification Devices), claims their chips, using a nnn-nnn-nnn format, has the capability of over 70 trillion unique numbers. The unique ID number is "etched" or encoded via a laser onto the surface of the microchip before assembly. Once the number is encoded it is impossible to alter. The microchip also contains the electronic circuitry necessary to transmit the ID number to the "reader". B) Antenna Coil: This is normally a simple, coil of copper wire around a ferrite or iron core. This tiny, primitive, radio antenna "receives and sends" signals from the reader or scanner. C) Tuning Capacitor: The capacitor stores the small electrical charge (less than 1/1000 of a watt) sent by the reader or scanner, which activates the transponder. This "activation" allows the transponder to send back the ID number encoded in the computer chip. D) Glass Capsule: The glass capsule "houses" the microchip, antenna coil and capacitor. It is a small capsule, the smallest measuring 11 mm in length and 2 mm in diameter, about the size of an uncooked grain of rice. The capsule is made of biocompatible

material such as soda lime glass. After assembly, the capsule is hermetically (air-tight) sealed, so no bodily fluids can touch the electronics inside. Because the glass is very smooth and susceptible to movement, a material such as a polypropylene polymer sheath is attached to one end of the capsule. This sheath provides a compatible surface which the bodily tissue fibres bond or interconnect, resulting in a permanent placement of the biochip.

The biochip is inserted into the subject with a hypodermic syringe. Injection is safe and simple, comparable to common vaccines. Anaesthesia is not required nor recommended. In dogs and cats, the biochip is usually injected behind the neck between the shoulder blades. According to AVID once implanted, the identity tag is virtually impossible to retrieve. The number can never be altered.

2) The reader: The reader consists of an "exciter" coil which creates an electromagnetic field that, via radio signals, provides the necessary energy (less than 1/1000 of a watt) to "excite" or "activate" the implanted biochip. The reader also carries a receiving coil that receives the transmitted code or ID number sent back from the "activated" implanted biochip. This all takes place very fast, in milliseconds. The reader also contains the software and components to decode the received code and display the result in an LCD display. The reader can include a RS-232 port to attach a computer.

How it works[6]: The reader generates a low-power, electromagnetic field, in this case via radio signals, which "activates" the implanted biochip. This "activation" enables the biochip to send the ID code back to the reader via radio signals. The reader amplifies the received code, converts it to digital format, decodes and displays the ID number on the reader's LCD display. The reader must normally be between 2 and 12 inches near the biochip to communicate. The reader and biochip can communicate through most materials, except metal.

Uses[7]

1. A newer kind of microchip called a VeriChip, which is also about the size of a grain of rice and which contains an identification number or other data, such as medical information, a person's address and phone number.
2. In animals the chip is used extensively, but VeriChip can be used in humans who have a pacemaker, artificial heart valves, or orthopaedic knee devices. If a patient would need help, a hospital could use a scanner to obtain information from the VeriChip.
3. A potential market for the chips would be a potential kidnap victim who could use these chips in combination with global positioning devices. Society in general could use them in place of ATM or credit cards.
4. In coming years, this new chip will be used in children, the elderly, prisoners, and by employers at facilities such as nuclear plants. Already airports are beginning to use similar micro-devices to improve security by tagging bags with more detailed instructions about how they are to be handled and screened. Automakers are installing the chips in keys to deter auto theft and Libraries are beginning to use the technology to track books.

The insertion of radio frequency identification (RFID) tag[8] into dentures could be used as an aid to identify decomposed bodies, by storing personal identification data in a small transponder that can be radio-transmitted to a reader connected to a computer.

Limitations[1]

There are so many potential problems and benefits with human micro chipping. One problem is invading of a person’s privacy. This could happen because of tracking of person’s movements, both physically and financially. Personal data about an individual could be sold or hacked into. A third potential problem could be storage of information and who can access that

information. Above all these there are potential health problems as well.

Health Risks[9]

Health risks are involved as with any type of surgery. The FDA has reported on the specific risks of the VeriChip microchip, some of which are: adverse tissue reaction, migration of implanted transponder, electro-magnetic interference, electrical hazards, and magnetic resonance imaging incompatibility. The civil libertarians warn that mass human implantation has not received enough debate and may put us on a slippery slope towards a system of human numbering. Also they contend that human micro-chip implantation will first be sold to the pop-ulace as being beneficial, fun, and ultra-convenient, convincing many that microchip implantations are benign. There is some worry that mass implantation will lead to large scale abuse.

CONCLUSION

Identification of person is very important in present world, because of globalization. There are many modes of identification such as fingerprints, dental casts, biometrics, DNA fingerprints and others. These methods are simple and economical, but large data has to be stored. So if the data is lost, identification of all the cases will be lost. In biochip, the data is stored in chip itself which is implanted in the person and there is no need to store the data separately. Easily the data can be read by a reader and it may become a new identification tool in future.

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Fig 1: Biochip Capsule[6]

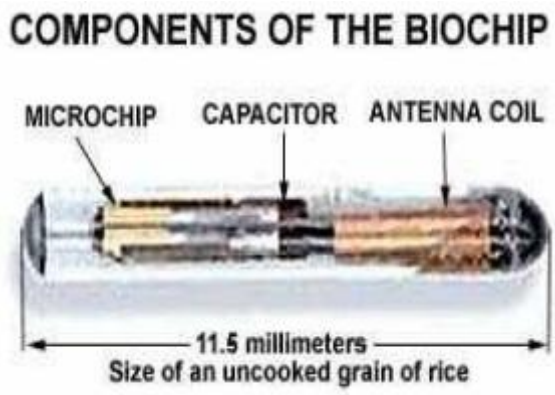

Fig 2: Components of a Biochip[6]

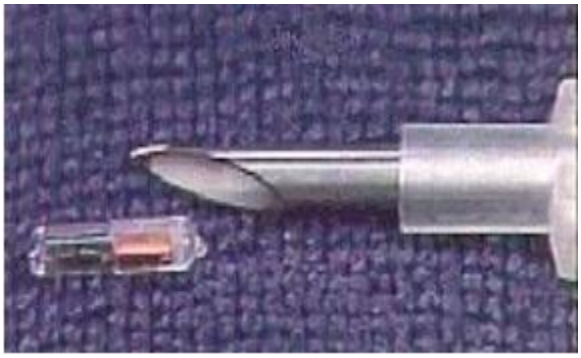

Fig 3: Hypodermic Syringe[6]