Envoy Esteem® Implantable Hearing Aid
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Abstract—Hearing aids can be embarrassing and hinder involvement in certain activities. The Envoy Esteem® Implantable hearing aid attempts to solve those problems by creating an internal hearing aid that does not rely on microphones, but on the human anatomy itself.

I. INTRODUCTION

External hearing aids can be both embarrassing and a hassle for people that need them. They consist of expensive electrical equipment that must remain on the outside of the body. They have to be taken off before going to sleep and they cannot get wet. The Envoy Esteem attempts to solve these problems by creating a fully implantable hearing aid that a user never has to take out with a very long battery life. The hearing aid is not for everyone with hearing loss as it is only effective for individuals with certain types of sensorineural hearing loss as it is an analog relay, that magnifies received sounds before passing them to the cochlea.

II. METHODS

The Envoy Esteem® consists of a sensor a driver and a sound processor. The sensor picks up vibrations from the eardrum through the incus and malleus and then transmits them to the sound processor. The sound processor then amplifies the vibrations and transmits the new signal to the driver. The driver physically moves the stapes with more powerful vibration which allows the imperfect cochlea to transmit better sound to the cochlear nerve.

The device is implanted surgically with a hospital stay generally requiring a short stay, about one to three days. First the sound processor part of the device is placed under the skin behind the ear in a pocket that is created in the skull through a mastoidectomy. Then a part of the incus bone is removed with lasers to allow for the cementing of the sensor and the driver onto the incus and stapes respectively.

IV. DISCUSSION

The Envoy Esteem® is a different type of hearing aid that hopes to make users more satisfied with their hearing aid. Because it is internal users have found that it is less embarrassing and they feel more confident. Their quality of life is also improved because they do not have to take off their hearing aid to shower, swim, or exercise. The battery life is also very long, from five to nine years before it needs to be replaced. Another advantage is the more natural sound that the Envoy Esteem produces, this is because it uses the eardrum rather than artificial microphones, which also gets rid of the feedback sounds traditional hearing aids can sometimes produce.

Some drawbacks of the Envoy Esteem® are that they are not a complete fix. It is only available for patients with sensorineural hearing loss because it still transmits sound in the natural way through the cochlea. People with certain conditions such as severe tinnitus and severe post-adolescent ear infections are not eligible for implantation of the device. It is also not available for people under the age of 18.

REFERENCES
[2] Envoy Esteem (Totally Implantable Hearing Aid) <http://surgery.arizona.edu/unit/center/ear-institute/implantable/total>