Brain Stem Implant to Cure Her Hearing Loss

NEW DELHI: Soon, four-year-old Fatima will be able to hear when her mother shouts her name. An Iraqi national, the child suffered from profound deafness since birth. Her parents had lost all hope when doctors told them Fatima was not eligible for a cochlear implant surgery, as she suffered from bilateral sensorineural hearing loss with underdeveloped cochlea the auditory porti on of the inner ear and auditory nerve. But the family is now jubilant after doctors at Indraprastha Apollo Hospital in a rare surgery carried out an auditory brain stem implant.

"In the absence of cochlea and auditory nerve, auditory brain stem implant is the only option,'' said Dr Ameet Kishore, senior consultant, ENT, Apollo Hospital. Till now, only two children have undergone this surgery in India and this is the first time Indian doctors performed it without any help from foreign experts.

On August 25, doctors made an opening at the back of her skull and entered the brain stem to place the implant. First, a receiver stimulator was subcutaneously placed behind her right ear. "The stimulator is connected with an electrode array which has 21 platinum contact points through a wire. We made a hole in the skull to reach the brain stem. We located the cochlear nucleus and implanted the electrode array,'' said Dr Kishore.

The biggest challenge was to place the electrode in the brain stem. Even a minor mistake can prove to be fatal or cause paralysis. "It is a difficult surgery. In a normal hearing process sound waves are transmitted to the ear. They travel from the eardrum through the middle ear to the cochlea, where sound waves get converted to electrical impulses. These electrical impulses travel through the brain stem to the hearing centre of the brain. In this case, however, the middle link was missing and we had to make a passage to deliver electrical impulse directly to the brain centre,'' said Dr Pranav Kumar, neurosurgeon, who was in the team that performed the 8-hour surgery.

The implant was successfully placed and doctors tested it while Fatima was still in the operation theatre. "It is important to check whether the implant works or not while operating. We can't take the risk of opening the skull again. We electrically invoke the auditory brain stem and study its response. We can also then fine-tune the implant,'' said Dr Kishore.

A week from now, doctors say, the child will start hearing through an external speech processor. "The processor also used by cochlear implant patients converts sound impulse into electrical impulse, which is directly delivered to the brain stem,'' said Dr Kishore, adding that this surgery is the only ray of hope for children whose cochlea is not formed or auditory nerve is damaged. Once the implant is activated, Fatima is all set to go home and start a new life.