

THE DEVELOPMENT OF A PRECURVED COCHLEAR IMPLANT ELECTRODE ARRAY AND ITS PRELIMINARY PSYCHOPHYSICAL EVALUATION



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A precurved banded electrode array may provide a better interface with the auditory neural pathways for cochlear implants, and provide better speech perception. A prototype array has been further evaluated for ease of insertion, siting within the cochlea and induction of any cochlear trauma. The arrays were inserted into the human cochlear under simulated surgery. The bones were embedded in Araldite, X-rayed and sectioned. X-ray reconstruction analyses of the position of the implanted array showed its insertion to be favourable. Cochlear implants with precurved arrays have been implanted in three patients. Psychophysical evaluation and X-ray analyses have shown that as electrode distance from the modiolus decreased: threshold current decreased; dynamic range increased; current spread as measured by forward masking studies, was more focused; electrode discrimination with loudness jitter (being a better representation of the dynamic speech signal) improved; JNDs for loudness, expressed as a function of dynamic range, decreased.

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