Can cochlear implantation restore spatial hearing in adults with single-sided deafness?

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Acquired unilateral severe-profound sensorineural hearing loss, or single-sided deafness, can have a severe detrimental impact on an individual's quality of life. The total or near-total loss of binaural cues has a hugely disruptive effect on listening in and navigating everyday environments. Cochlear implantation holds great promise as an intervention that could address the difficulties that these individuals face, by restoring bilateral access to sound. Previous studies have demonstrated that cochlear implantation reduces localisation error and improves speech perception in noise in these adults. I will present data from a prospective multi-centre study of cochlear implantation in adults with single-sided deafness whose aim was to better understand the nature of improvements to spatial hearing and hearing-related quality of life. The spatial listening abilities and self-reported listening difficulties of adults with acquired unilateral severe-profound sensorineural hearing loss were assessed at baseline and after being implanted unilaterally. Sound localisation was assessed in an anechoic chamber before and 9 months after implantation using a 48 loudspeaker array that was capable of recreating the patterns of reverberation that arise in a variety of listening environments. Detailed information on their listening performance, device programming, device usage, and the extent to which they listened to training materials through the implant alone were recorded. I will present analyses of their localisation performance and identify what factors influenced whether a patient receives spatial benefit, and discuss the implications for candidature and rehabilitation. I will also discuss the extent to which the benefits to spatial hearing observed in the laboratory could be generalised to benefits in everyday life.