

Imaging of cochlear implants: What the radiologist needs to know

March 12, 2019: Gerlig Widmann, Innsbruck/AT

Dr. Gerlig Widmann

Gerlig Widmann, MD and PD-Privatdozent (Medical University of Innsbruck), MSc (University of Applied Health Sciences Tirol), EBIR (European Board of Interventional Radiology) works as a consultant diagnostic and interventional radiologist, chief of head and neck radiology and clinical risk manager at the Department of Radiology, Medical University of Innsbruck, Austria. He is board member and past-secretary of the Austrian Roentgen Society, member of the radiology examination council of the Austrian medical chamber and current chair of the head and neck radiology working group of the Austrian Roentgen Society.



Abstract

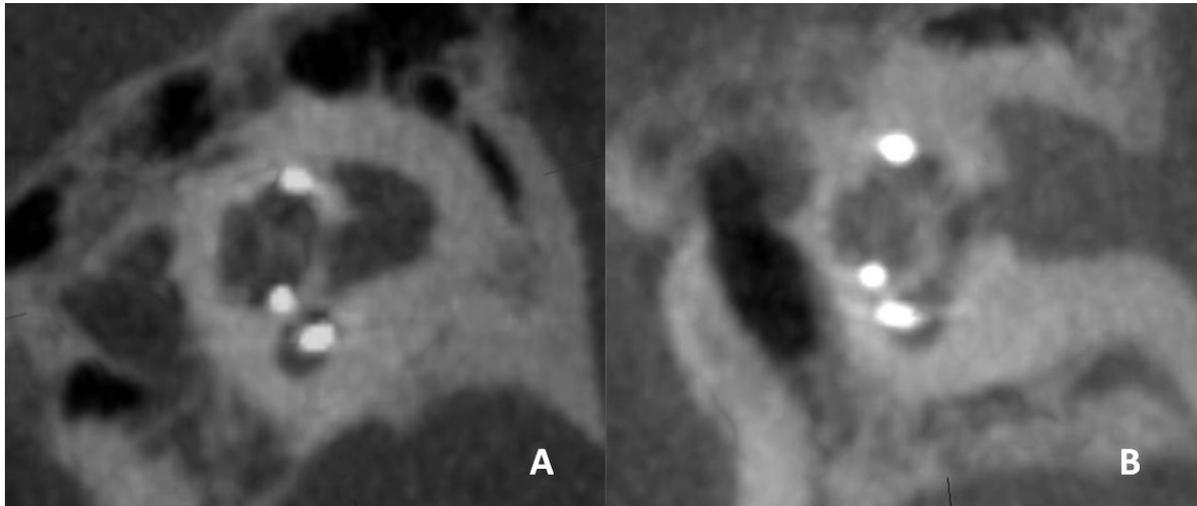
Cochlear implants have become an increasing treatment option for various sensorineural hearing disorders in both children and adults. Pre-operative CT and MRI are complementary and play a pivotal role for patient selection, rule out of contraindications and identification of findings which may have an impact on the surgical approach. The position of the electrode array within the cochlea can be reliably identified using post-operative CBCT or CT. Recognition of favorable, less favorable and malposition of the electrode array may have important consequences for the patient such as revision surgery or refined tuning.

Learning Objectives

1. To describe a realistic and practical protocol for pre- and post-operative imaging for cochlear implants
2. To review the key imaging findings precluding cochlear implantation or having an impact on the surgical approach
3. To discuss the normal imaging aspect of the most common types of cochlear implants used currently
4. To illustrate typical examples of less favorable implant position, malposition, as well as other causes of implant dysfunction

Teaser

Which of the images makes your ENT surgeon happy - A or B?



Test Your Knowledge

Only one answer is correct.

1. Complementary pre-operative CT and MRI imaging may be omitted in the following indication
 - a. otosclerosis
 - b. history of meningitis
 - c. severe middle ear disease
 - d. dysmorphic syndromes
2. Which of the following statements on post-operative MRI is right?
 - a. fat-sat sequences have minimal influence on image quality
 - b. diffusion weighted images are distorted
 - c. high-resolution images decrease image quality
 - d. CISS or FIESTA sequences increase image artifacts
3. Which of the following conditions may not have an impact on the surgical approach?
 - a. large cochlear duct
 - b. common cavity
 - c. enlarged vestibular aqueduct
 - d. chronic otitis media
4. Which of the following conditions is not a contraindication for cochlear implant surgery?
 - a. Michel's deformity
 - b. vestibular nerve aplasia
 - c. sclerosed labyrinth
 - d. CHARGE syndrome

5. Which position of the electrode array of a cochlear implant is preferred?
- a. Scala tympani
 - b. Scala vestibuli
 - c. Scala media
 - d. Scala modioli