New Bone Formation of the Guinea Pig Cochlea after Usage of Antiseptis Evaluated with a Micro-CT Scanner

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Abstract

Objectives: This study quantified new bone formation in the middle ear cavity of the guinea pig after topical antiseptic application.

Materials and Methods: Adult Hartley guinea pigs were used. Three different antiseptics that are used clinically to treat chronically discharging ears were studied: povidone-iodine, methylrosaniline chloride, and 13% (w/v) aluminum acetate.

Results: The temporal bones of the animals were scanned using *in-vivo* micro-tomography (micro-CT) before and 2 and 4 weeks after filling one of the middle ear cavities with antiseptic. Three-dimensional (3D) micro-CT images of the temporal bone were obtained and the thickest part of the bone defined as the region of new bone formation. After measurements were completed, the temporal bones were harvested for histopathological evaluation. Celloidin-embedded specimens were cut into 20-μm-thick slices, stained, examined microscopically, and the results compared with the micro-CT findings.

Conclusions: The SkyScan 1178 enables repeated 3D observations of the temporal bone in the living guinea pig. The results were in good agreement with the histopathological findings.

Key words: New bone formation, Micro-CT scanner, Cochlea, Guinea pig