

skin share the same cytokeratin pattern which may support the ectodermal rest theory.

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Novel human stem cell-like cells in middle ear cholesteatoma tissue and auditory canal skin

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Learning Objectives:

Being a potential life-threatening middle ear disease, cholesteatoma is an abnormal expanding cystic lesion leading to extensive tissue destruction in the temporal bone followed by conductive and sensorineural hearing loss and facial nerve palsy. Facilitating further infections beyond those of the middle ear, cholesteatoma may also result in meningitis or intracranial infections. Since surgical removal of cholesteatoma remains as the only therapeutical option, lack of non-advanced medical care results in increased pediatric morbidity, emphasizing the need of developing new treatment strategies.

Here we show for the first time the presence of a novel stem cell-like cell population in cholesteatoma tissue and auditory canal skin. Immunohistochemical analysis of cholesteatoma tissue revealed the presence of Nestin-expressing cells localized subepithelially within the matrix and perimatrix. Nestin-positive cholesteatoma-derived stem-like cells (CSCs) were successfully isolated and cultivated *in vitro* and showed the capability of neurosphere formation and clonal growth. CSCs were further successfully expanded within a human blood-plasma derived three-dimensional matrix. In accordance to the classification of cholesteatoma, proliferative Ki67-positive CSCs also showed a normal euploid DNA content and karyotype. We further observed no changes in proliferative capability and expression profile between CSCs and Nestin-expressing cells isolated from auditory canal skin (auditory skin derived cells, ASCs). In particular, cultivated CSCs and ACCs expressed epithelial and neural crest-specific stemness markers.

Our findings gain new insights in the complex biology of cholesteatoma and may thus broaden the range of treatment strategies for this severe lesion within the middle ear.

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The role of preoperative gadolinium enhanced magnetic resonance imaging (MRI) in anticipating postoperative middle ear aeration after canal wall up tympanoplasty for cholesteatoma

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Learning Objectives:

Objective: This study was designed to anticipate the post-operative middle ear aeration using preoperative gadolinium enhanced magnetic resonance imaging (MRI) after canal wall up tympanoplasty (CWU) for cholesteatoma.

Materials and methods: Retrospective review was performed on 56 patients with mastoid involvement undergoing CWU tympanomastoidectomy without mastoid obliteration at a single institution from 2010 to 2013. In all patients, the cholesteatoma was removed by a combined approach. The communication between the Eustachian tube and the attic was reestablished with a posterior and anterior tympanotomy. The attic bony wall defect was reconstructed using sliced auricular cartilage and fibrin glue (scutum plasty). Patients were classified into two groups according to the status of enhancement around the cholesteatoma sac using pre-operative MRI: Group A (strongly enhanced) and Group B (weakly or no enhanced). In each group, restoration of the middle ear aeration was assessed with high-resolution computed tomography (CT) before and after operation. Status of aeration was classified into 4 grades (no aeration, mesotympanum, epitympanum, mastoid).

Results: Although the middle ear aeration ameliorated in both groups, the range of re-aeration was much better in Group A (strongly enhanced group) than Group B. Re-aeration to the mastoid was achieved in 68% of the cases in Group A, 36% of the cases in Group B.

Discussion and Conclusion: The enhanced MR image was found to be related to postoperative middle ear aeration. These findings might be particularly useful for predicting re-aeration of acquired cholesteatoma.

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The results of obliteration technique in canal wall up and wall down tympanomastoidectomy in patients with acquired middle ear cholesteatoma

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Learning Objectives:

Introduction: The objective in the surgical management of acquired middle ear cholesteatoma is eradication of disease