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*Learning Objectives:*

**Introduction:** The study aimed on evaluating the benefit of a preoperative three-dimensional (3D) planning tool for surgically placement of the bone conduction floating mass transducer (BC-FMT) of the Bonebridge (BB) bone conduction hearing implant. As the BB should be implanted in the mastoid without compromising the dura or the sigmoid sinus, placement may be challenging especially in children with small mastoids, in malformations and after multiple ear surgery.

**Method:** Since 2012, the Bonebridge was implanted in 22 Patients, including 7 children <16 y old (mean = 34.2 y ± 23.4 SD; min 5, max 76 y). Audiological testing was performed preoperatively, and 1 month and 3 months post-operatively. A preoperative planning tool was developed based on high resolution CT-scans of the temporal bone: AMIRA-software based 3D models of the Bonebridge implant and of the skull were freely adjusted and fused, allowing to detect the optimal implant position (“virtual surgery”). Transfer to the intraoperative situation was performed based on anatomical landmarks.

**Results:** The BB could be accurately placed in the selected locations. Simultaneous planning and implantation of the BB and bone anchors for ear prosthesis was performed in 2 cases. In some cases, preoperative planning revealed insufficient bone thickness of the mastoid, preventing BB-implantation. Audiological data showed a significant benefit 3 months after implantation in speech recognition, hearing in noise, in directional hearing and sound localization.

**Conclusions:** Audiological results were comparable to those reported in other studies about bone anchored hearing systems. Preoperative 3D planning is recommended especially in primarily small, poorly pneumatized mastoids, hypoplastic mastoids in malformations, reduced bone volume after canal wall down mastoidectomy, small mastoids in children, and for planning of simultaneous implantation of bone anchors for ear prostheses.

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## Cholesteatoma and the mastoid (N843)

**ID: 843.1**

### Secondary obliteration of discharging mastoid cavities

Presenting Author: **Lars Vendelbo Johansen**

Lars Vendelbo Johansen  
Aarhus University Hospital

*Learning Objectives:* I will demonstrate how I now manage old discharging radical cavities. Over the years I have been

using several techniques and with varying success. Now I most frequently use BonAlive as obliteration material, some times in combination with the temporal periosteal flap (described by M Yung and P Smith). I will present videos and pictures from the operations and updated figures of my material.

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## Cholesteatoma and the mastoid (N843)

**ID: 843.2**

### Incidence of mastoidectomy among cholesteatoma patients in Denmark

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*Objective:*

- 1) To describe the incidence rate of first-time surgically treated middle ear cholesteatoma (STMEC1) in Denmark 1977–2015 and to estimate the proportion undergoing mastoidectomy.
- 2) To describe the recurrence rate after STMEC1 on Funen 1982–2015 taking surgical approach into consideration.

**Methods:** Cases of STMEC1 were identified by the use of the Danish National Hospital Register which also provided data on mastoidectomy. A change in incidence rate over time was examined using Poisson regression analysis.

For STMEC1s on Funen, the medical records were reviewed. The rate of recurrence was analyzed by the Kaplan Meier method and Cox regression analysis.

**Results:** A total of 16,475 STMEC1s were identified. Of these 4,416 (27%) were children (<16 years of age) and 12,059 (73%) were adults.

The incidence rate of STEM1 in adults was stable at 6–7 per 100,000 person years for the last couple of decades.

In children the incidence rate fell from 15 per 100,000 person years in 2002 to 7 per 100,000 person years in 2015.

The proportion undergoing mastoidectomy was stable (53% in children and 58% in adults).

The medical records from 1,003 patients with cholesteatoma (1,056 ears) were reviewed. The overall proportion of ears with recurrence was 38% in children and 14% in adults 5 years after primary surgery. Individuals without the need of mastoidectomy were at lowest risk of recurrence while individuals undergoing canal wall up (CWU) without