

Local Antibiotic Therapy Using Calcium Sulfate in Lateral Skull Base Osteomyelitis: A Case Series

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First experiences with the implantation of an **absorbable antibiotic carrier** as local adjuvant long-term therapy for osteomyelitis of the lateral skull base as a result of otitis externa.

Methods

- 4 cases with otogenic skull base osteomyelitis caused by *Pseudomonas aeruginosa* (Abb. 1, Tabl. 1)
- Systemic antibiotic therapy (Piperacillin/Tazobactam i.v.) + surgical treatment + filling with **Gentamicin-impregnated Calciumsulfat (GCS)**
- 1 Pat. spread of inflammation via **foramen tympanicum** to the temporomandibular joint
- 2 Pat. with **NVII-palsy** and 1 Pat. with additional **NXII-palsy** (Abb. 2)
- 1 Pat. **salivary fistula** at the floor of the auditory canal

Pat.	Age (years)	Cranial nerve palsy	Surgical approach	Risc factors	ESR	CRP	Postop. treatment i.v. (weeks)	Postop. treatment p.o. (months)
1	85	VII	transmastoid	Hearing aid, exostoses	-	17.2	2	3
2	57	VII, XII	transmastoid	Diabetes mellitus,	80	25.0	2	3
3	80	-	endaural	Diabetes mellitus, CLL	10	16.2	2	1.5
4	87	-	endaural	Hearing aid, exostoses	40	625	1	5

Tabl. 1 Patient demographics. Pat.: Patient, ESR: erythrocyte sedimentation rate preoperative, CRP: C-reactive protein preoperative, Postoperative antibiotic treatment i.v.: Pipracillin/Tazobactam, Postoperative antibiotic treatment p.o.: Ciprofloxacin, CLL: Chronic lymphatic leukemia

Results

- The mean follow-up period was **15 months** [Range: **12 - 22 months**] from December 2023 to October 2025
- average patient age: **77,5 years**
- preexisting cranial nerve deficits showed **partial to full resolution**
- No complications** due to the antibiotic carrier
- Serum calcium** in the normal range postoperatively
- Ototoxicity** ruled out by functional diagnostics

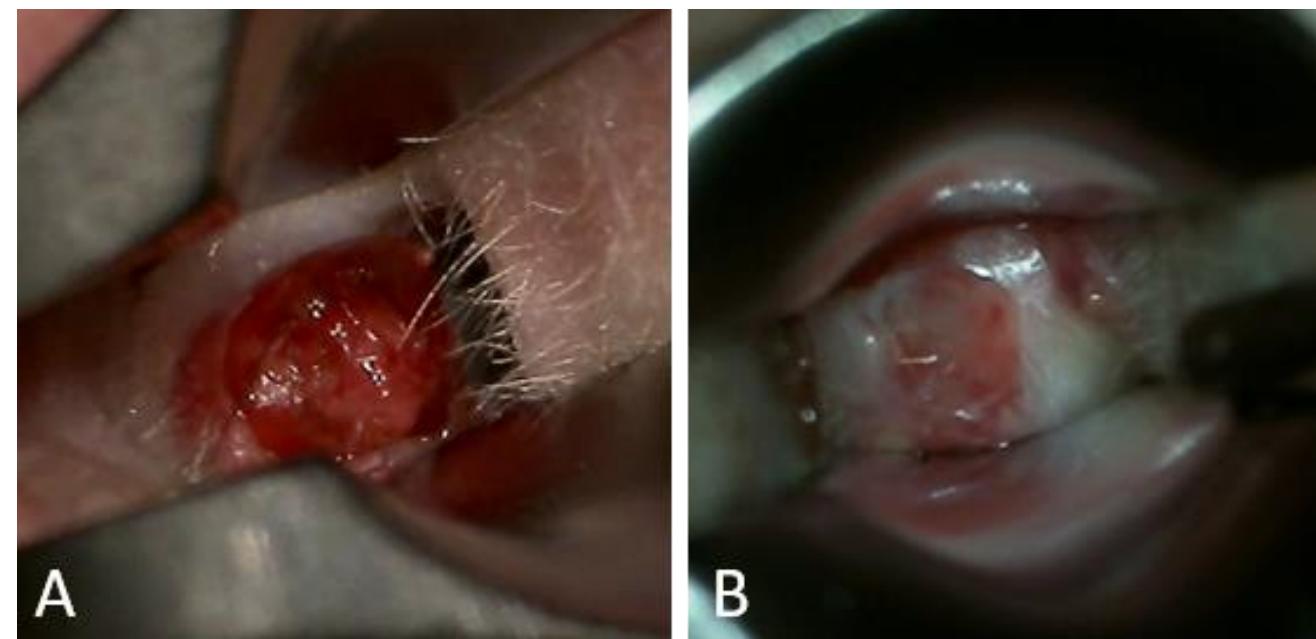


Abb. 1 Pathognomonic findings: Granulations (A, Pat. 1) or salivary fistula (B, Pat. 3) at the floor of the auditory canal (cartilage-bone junction).

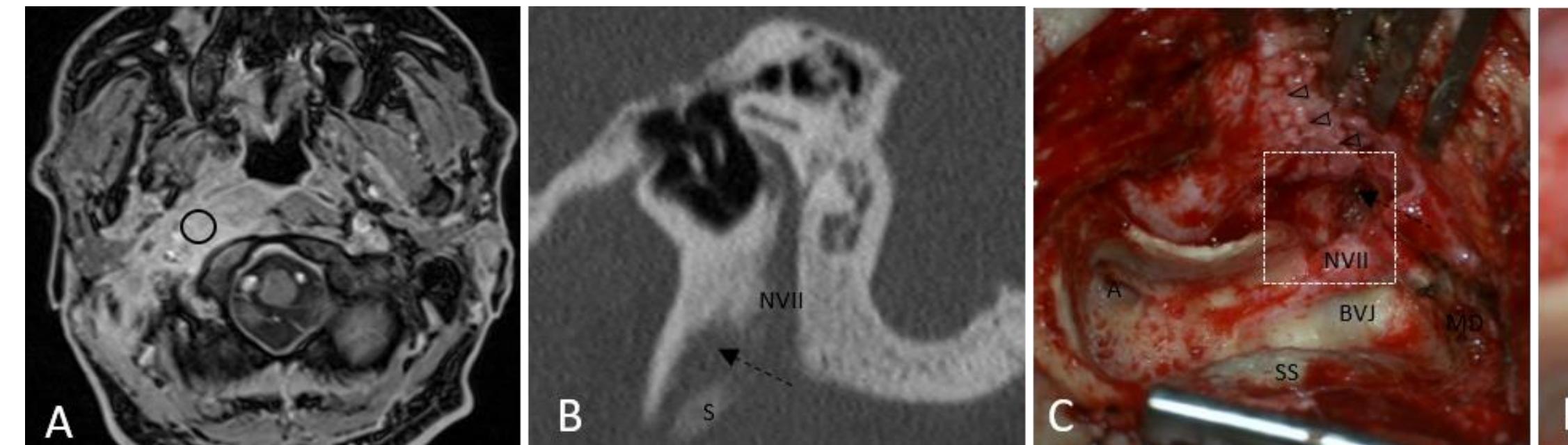


Abb. 2 Pat. 2. A, MRI-T1 (axial), extent of infection, contrast image (circle). B, CT (sagittal) of the tympanic bone with arroded styloid base (arrow). C, Mastoideotomy with exposure of the facial endosteum at the stylomastoid foramen. D, enlarged section (white square of C) with drainage of the pus (arrow) directly from the area of the exposed jugular vein bulb. E, resection defect with GCS. A: antrum, S: styloid, SS: sigmoid sinus.

Conclusion

- The implantation of gentamicin-impregnated calcium sulfate is **a promising adjuvant therapeutical option** for local long-term antibiotic application in skull base osteomyelitis.
- The resorbable matrix **supports defect reconstruction** and could **minimize the risk of local recurrence**