

BAHA operations Gentofte 2004-2012.

New database.

Indications, operations and postoperative data on 201 patients.

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- Acknowledgement to:
- Sven Eric Stangerup
- Mads Sølvsten
- Per Bonding

Danish Baha file 1986-2001

- National database. Handwritten formulas locally, and sent to PB who collected data.
- 1986 – 2001
- 158 patients:
- Gentofte 6
- Glostrup 38
- RH 51
- Århus 43
- Odense 20

Aim of project

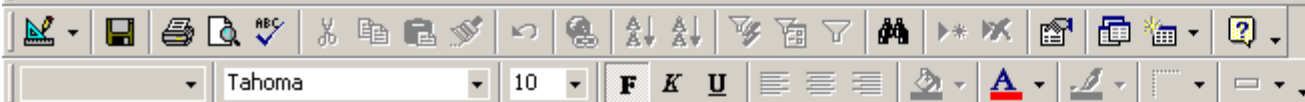
- Greater insight in BAHA operations in DK
- To make a new database
- Same platform in DK
- Decentral database
- Possibility to collect and pool data from all hospitals

Hypothesis

- A rise in numbers of BAHA-operations since 2001
- 2001 SSD was accepted as indication for BAHA
- More awareness about BAHA
- Fall in postoperative complications after simplification of surgical technique.

New database

- Based on Microsoft Access
- Communicating with Auditbase (as otokir. Database)
- Local database
- Prospective database. But possible to collect retrospective data.



BAHA Database - AuditBase4



[Ny patient - pre-/per-operative data](#)

[Ny patient - Trin 2 operation](#)

[Retro- / Full record](#)

[Kontrol 10 dage postoperativt](#)

[Kontrol 6 uger postoperativt](#)

[Kontrol 6 måneder postoperativt](#)

[Kontrol 1 år postoperativt](#)

[Kontrol 3 år postoperativt](#)

[Kontrol senere end 3 år postoperativt](#)

[Exit database](#)

Microsoft Access - [AB-Lookup - formular]

Filer Rediger Vis Indsæt Formater Poster Funktioner Vindue Hjælp

Tahoma 8 **F** **K** **U**

Patient ID: 18074 **Import patient data** First names: MOGENS BENT Last name: ~~P. JENSEN~~

Side of the operated ear: Right **Select side or confirm side by clicking the drop box**

Date of Audiometry: 19-11-2009 Aud.No: 1 Date of surgery:


	500Hz	1000Hz	2000Hz	3000Hz	4000Hz	8000Hz	SRT	DS
BC-Op	30	15			60		40	87
AC-Op	65	40	45	90	115	105		
BC-Ref	30	5			55			
AC-Ref	25	15	40	70	80	80	20	96
BC Best			30					

Red numbers = 'not heard' (not exported)
Bold numbers = masked threshold
 Empty field = not measured

Transfer best ears BC

Return with report of data

Export pre-op data (retro)



BAHA Database - Første eller eneste trin. Pre-/per-operative data.

Importér audiogram

Stamdata:

Patient CPR: 18074 Fødselsdato: 18-07-1948 Fornavn: MOGENS BENT Efternavn: Operatørside: right

Indikation:

Perceptive høretab: Kronisk otit sequelae
Syndrom: Relevant sygdom: Intet
Konduktivt høretab: Ensidig døvhed: Problem ved HA behandling:

Audiometri:

Audiometri dato: 19-11-2009

Data for operations-øret:

	500 Hz	1 kHz	2 kHz	3 kHz	4 kHz	8 kHz	BC (4-pta)	BC (3-pta)	AC (4-pta)	ABG (4-pta)
Bone conduction	30	15			60				60	
Air conduction	65	40	45	90			SRT: 40	D5: 87		

Data for reference-øret:

	500 Hz	1 kHz	2 kHz	3 kHz	4 kHz	8 kHz	AC (4-pta) reference ear	Inter-Aural Diff AC
Bone conduction	30	5			55		38	22
Air conduction	25	15	40	70	80	80	SRT: 20	D5: 96

Operations data:

Operations dato: 26-11-2009 Alder ved operation: 61 Implantat nr.: 1 Ét eller to operations trin:

Anæstesi: generel anæsi Operationsteknik: Manuel lap Producent, implantat: Implantat længde: 4 mm

Abutment længde: Implant Insertion Torque: Knoglekvalitet: ISQ høj: ISQ lav:

Peroperative komplikationer: Ingen Kirurg: SF

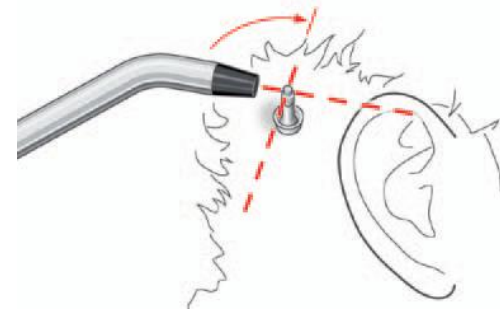
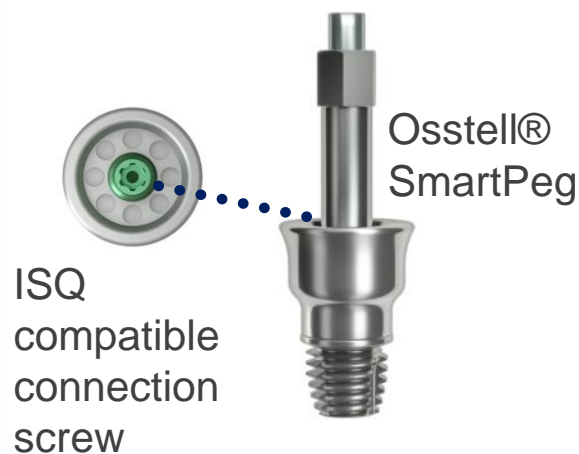
Bemærkninger: Skiftet til længere abutment 9 mm

Gem og luk

Implant stability

The ISQ measure

- Measured using Osstell™ Mentor equipment and SmartPeg (accuracy ± 2 ISQ)
- SmartPeg connected to abutment
 - Bone quality, implant design, abutment length, etc. will influence measurement





BAHA Database. Kontrol 10 dage postoperativt.

Find patient/operation

Index data:

Patient CPR: 18-11-27 Operationside: right Implantat nr.: 1 Operations dato: 26-11-2009 Operationsdato for trin 2:
Fornavn: MOGENS BENT Efternavn:
Kirurg, trin1: SF Kirurg, trin 2:

Dato for 10-dages kontrol: 09-12-2009

Infektion Blødning/hæmatom Smerter Hudnekrose Meningitis Intracranial blødning

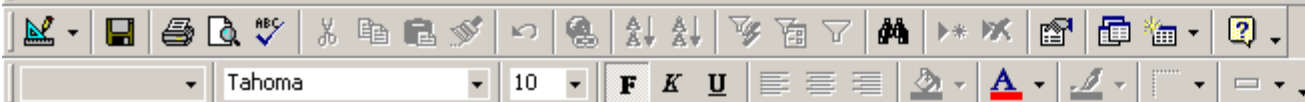
Hud niveau: Ideel (A) - nederste 1/3 af abutment Hud iflg Holger: 1 Let rødme

Aktion: Intet Stabilitet: Fast

ISQ1: ISQ2: Implantat fjernet:

Bemærkninger: Skiftet til længere abutment 9 mm

Gem og luk



BAHA Database - AuditBase4

[Ny patient - pre-/per-operative data](#)

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[Kontrol 6 uger postoperativt](#)

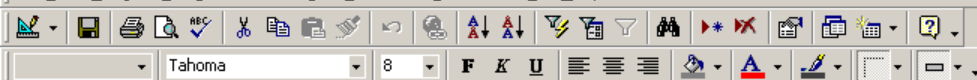
[Kontrol 6 måneder postoperativt](#)

[Kontrol 1 år postoperativt](#)

[Kontrol 3 år postoperativt](#)

[Kontrol senere end 3 år postoperativt](#)

[Exit database](#)



BAHA Database. Kontrol 1 år postoperativt.

Index data:

Patient CPR: 180748-C Operationside: right Implantat nr.: 1 Operations dato: 26-11-2009 Operationsdato for trin 2:
Fornavn: MOGENS BENT Efternavn: Kirurg, trin1: SF Kirurg, trin 2:

Dato for 10-dages kontrol: 09-12-2009

Dato for 6-ugers kontrol:

Dato for 6-måneders kontrol:

Dato for 1-års kontrol: 10-11-2010

Hud niveau: Dækket (D)

Hud iflg Holger: 0 Ingen irritation

Aktion: monteres forlænget abutment

Stabilitet: Fast

ISQ1: ISQ2:

Implantat fjernet:

Bemærkninger: Skiftet til længere abutment 9 mm



BAHA Database - AuditBase4

Ny patient - pre-/per-operative data

Ny patient - Trin 2 operation



Retro- / Full record

Kontrol 10 dage postoperativt

Kontrol 6 uger postoperativt

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Peroperative komplikationer: Ingen Kirurg: SF

Bemærkninger: Skiftet til længere abutment 9 mm

Gem og luk

Operationsdato for evt. trin 2: Kirurg, trin 2: Anæstesi 2: Abutment længde: Perop komp 2:

Kontrol data, 10dage: Dato for 10-dages kontrol: 09-12-2009

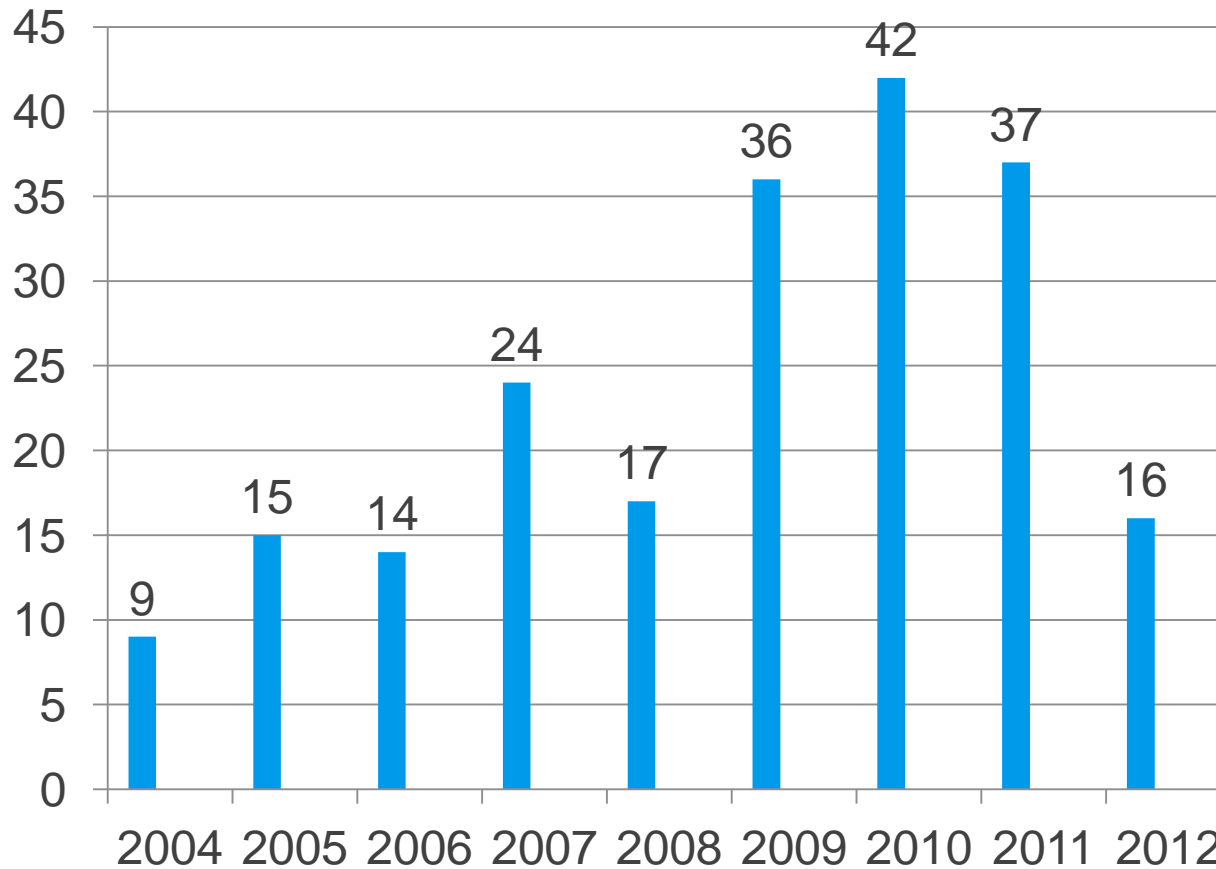
Infektion Blødning/hæmatom Smerter Hudnekrose Meningitis Intracranial blødning

Hud niveau: Ideel (A) - nederste 1/3 af abutment Hud iflg Holger: 1 Let rødme

Aktion: Intet Stabilitet: Fast

Results. BAHA operations at Gentofte 2004-2012.

Baha operations pr. year Gentofte



Age at operation (total n =201)

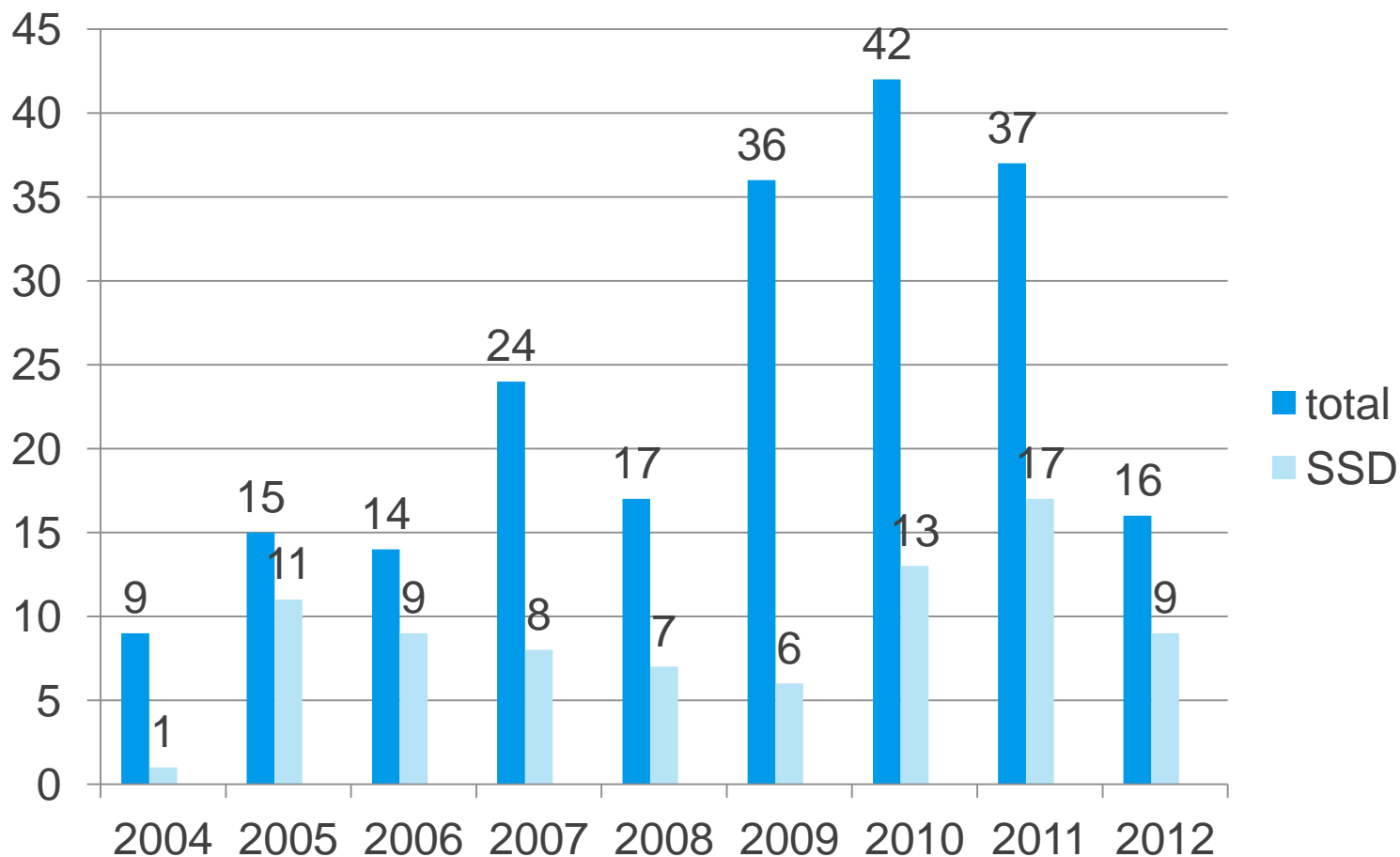
- 0-16 years: 11
- 17-64 years: 128
- > 65 years: 62

- Median age 58 years (range 6 -93)

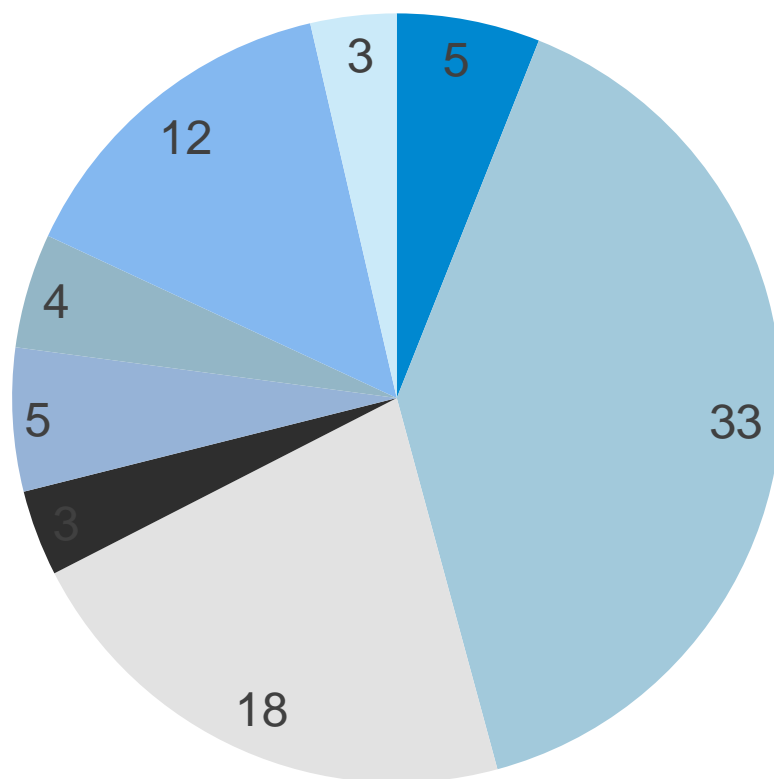
Indications

- Mixed hearing loss: 22
- Conductive hearing loss: 82
- Single Sided deafness (SSD): 83
- Sensineural hearing loss: 12
- Unknown: 2

Total og SSD



Causes of SSD (n = 83)



- AN non-operata (n = 5)
- AN operata (n = 33)
- Andet (n = 18)
- Cholesteatom (n = 3)
- Congenit (n = 3)
- Postinfektøs (n = 4)
- Sudden deafness (n = 12)

Type of operation

- One step: 195 operations
- Two step: 6 operations. 5 children(7,8,9,11,12 y) and one re-operation (51 y)
- General anesthesia: 51 patients
- Local anesthesia: 150 patients

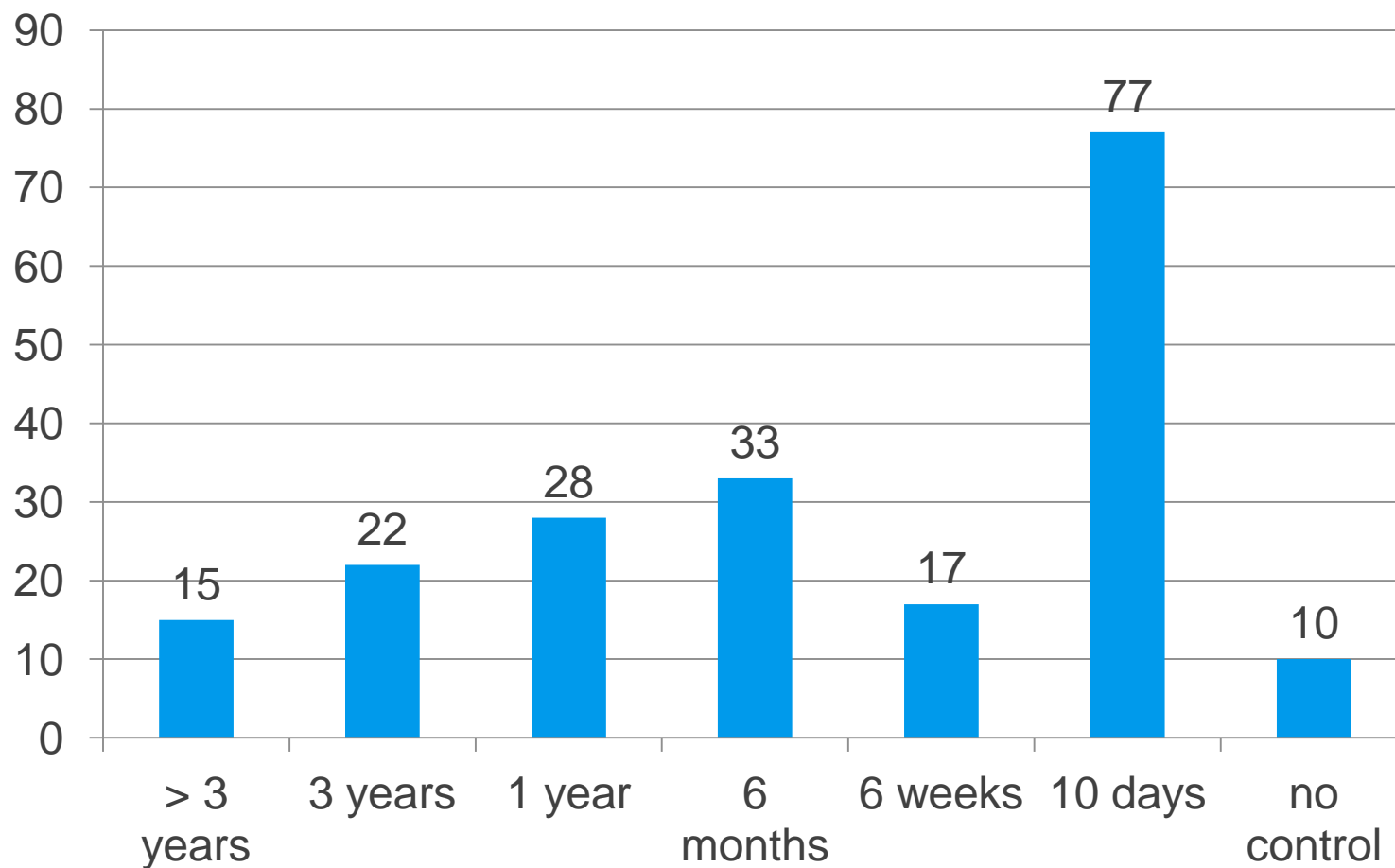
Operation technique

- Free flap : 9
 - Dermatom flap: 9
 - Pedicled flap: 74
 - Linear incision: 102
 - Not described: 6
-
- Implant 3 mm: 3 patients
 - The rest 4 mm

Surgeons

- HG: 1
- PB: 47
- PC: 11
- SES: 42
- SF: 93
- Unknown: 7

Follow-up period. Time for last control.



Peroperative complications

- 5 operations heavy venous bleeding (sinus)
- 1 operation soft bone, re-position of implant

- Early postoperative complication:
 - 4 Bleeding
 - 1 pain
 - 1 Skin necrosis
 - 0 meningitis
 - 0 intracranial bleeding

Re-implantations

- 1 patient 5 implants. 57 y,
- 1 patient 4 implants. 78 y
- 1 patient 3 implants. 51 y
- 4 patients 2 implants. 13, 20,64,68 y

Soft tissue reactions

- Holgers classification:
 - Grade 0 No irritation
 - Grade 1 Slight redness
 - Grade 2 Red and moist tissue
 - Grade 3 Granulation tissue
 - Grade 4 Infection leading to removal of the abutment

Skin infections

- Infection defined as local treatment plus systemic antibiotics or lapis. Holger grade ≥ 2 .
- 60/446 consultations = 13 %.

Shift to longer abutment

- 6 patients
- **Loss of abutment:**
- Spontaneous loss after 6 month: 3 "children" (12,17,19 y)
- Spontaneous loss after 1-5 year: 3 adults

Removal of abutment

- 11 patients

7 patients not using BAHA

3 patients because of pain

1 unknown reason

Surgical removal of implant

- 4 patients. Implant drilled out in GA.
- 2 because of deep pain
- 1 shift to CI
- 1 unknown reason

Other studies

Author	year	implants	observations	Soft tissue %	Lost implant %	Age
House	2007	149		9,4	3,4	2-85
Wazen	2008	223	3,7 years	13	1,3	6-92
de Wolf	2009	248	1180	12,3	6,5	60-87
Faber	2009	248	1777	15,3	1,3	>17
Hobson	2010	602	> 1 year	18,1	4,9	4-87
Our study	2012	201	446	13,5	3,0	6-93

Conclusions

- A rise in BAHA-operations, especially because of SSD operations.
- Expected loss of implant in children.
- Comparable incidences of soft tissue reactions and implant losses.

Drawbacks

- short follow-up period to estimate long term complications
- no standardized follow-up program
- retrospective data until now

Perspectives

- Collaboration with audiological department
- *Measuring the effect of BAHA:*
- SRT in free field with BAHA, Signal to noise-test
- Questionnaire 1 year after operation
- Standardized controls/checklist: Implant stability, The skin according to Holgers grading system, Skin overgrowth. Pain. BAHA – nurse?
- How many controls, for how long?