

Titanium prostheses in otosurgery. Results from 2008 to 2010

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Introduction

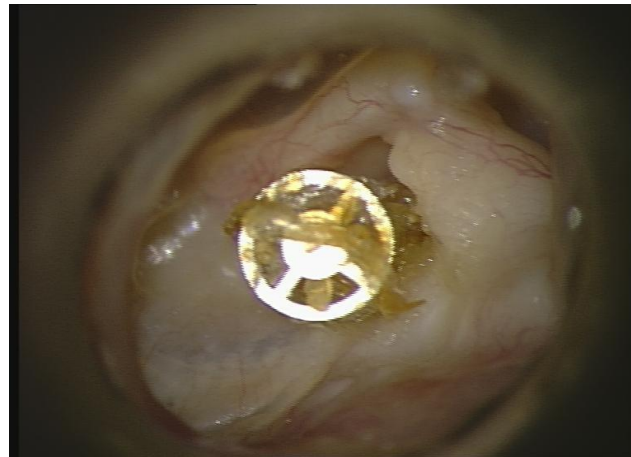
- Titanium PORP's and TORP's have been employed by more surgeons during later years
- Problems related to extrusion of prostheses

Purpose

- To evaluate the early occurrence of extrusions
- To evaluate the early hearing results

Methods and Materials

- Ossiculoplasties from 1st October 2008 to 1st October 2010
- Test group = all titanium PORP and TORP's reconstructions
- Control group = all autologous incus type II and III reconstructions



Methods and Materials – retrospective study

- 121 consecutive ossiculoplasties
- 14 non-titanium PORP and TORP's excluded
- 107 ossiculoplasties included

- Follow-up time = 1 y mean
- Age = 32 y mean (range = 5-78 y)
- Female/male = 51/56

Methods and Materials*

| | Autologous incus | Titanium | Total |
|-----------------|------------------|----------|----------|
| Type II / PORP | 46 (39) | 24 (23) | 70 (62) |
| Type III / TORP | 17 (17) | 20 (17) | 37 (34) |
| Total | 63 (56) | 44 (40) | 107 (96) |

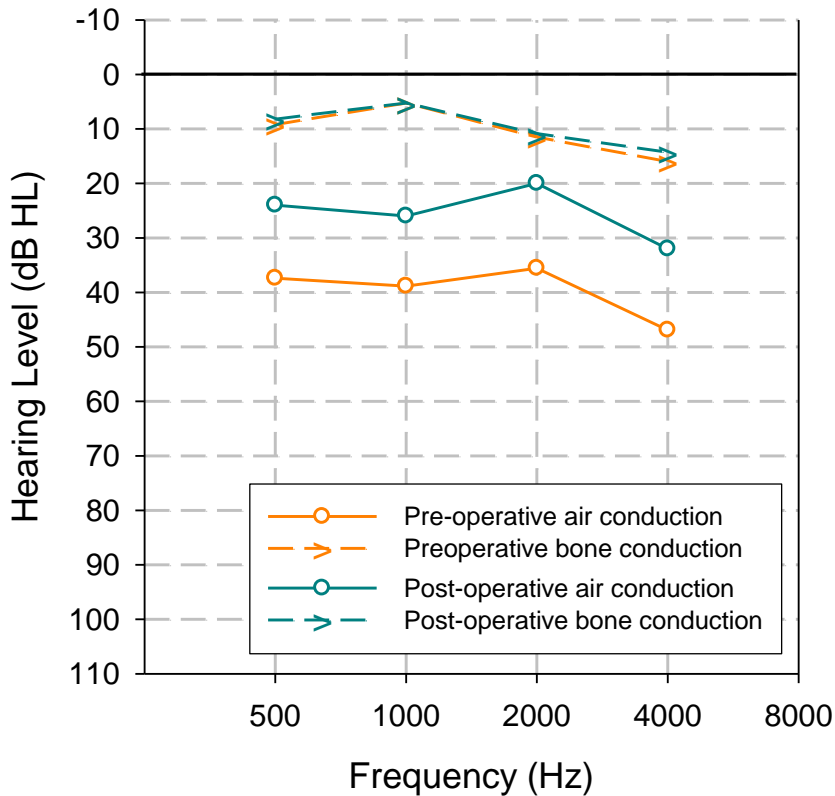
*numbers in parentheses are follow-up; ie. 9 cases escaped 1-year follow-up

Results – extrusions

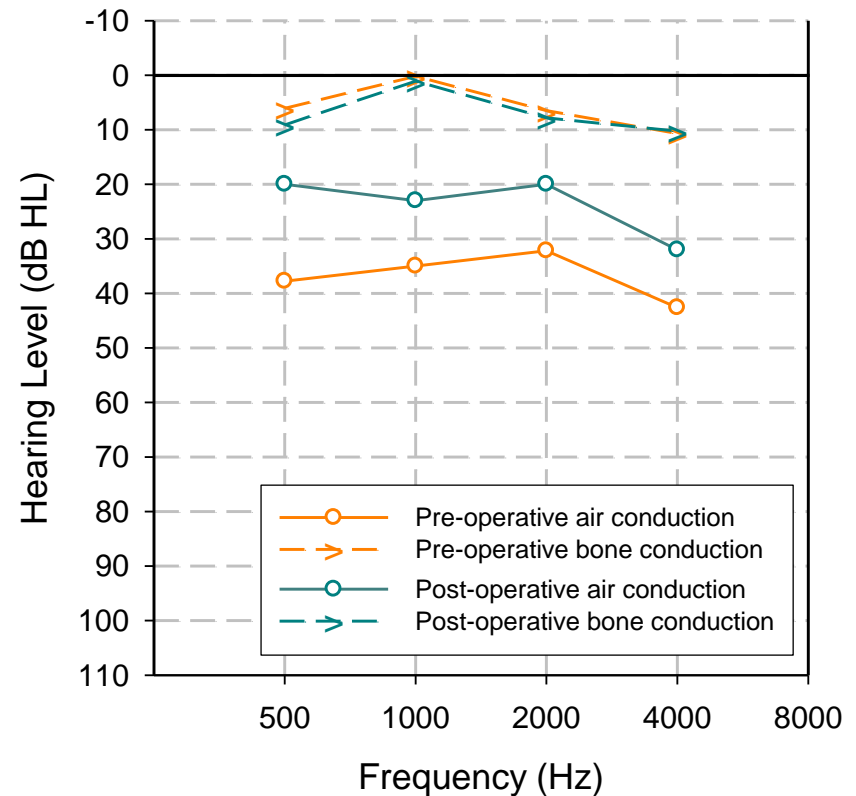
- Extrusions of titanium = 2 cases \approx 5 % of procedures (2 per 40 titanium prostheses at follow-up)
 - PORP Clip 2.25 mm prosthesis
 - PORP Vario Bell 2.50 mm prosthesis

Results – hearing reconstruction type II / PORP

Autologous type II

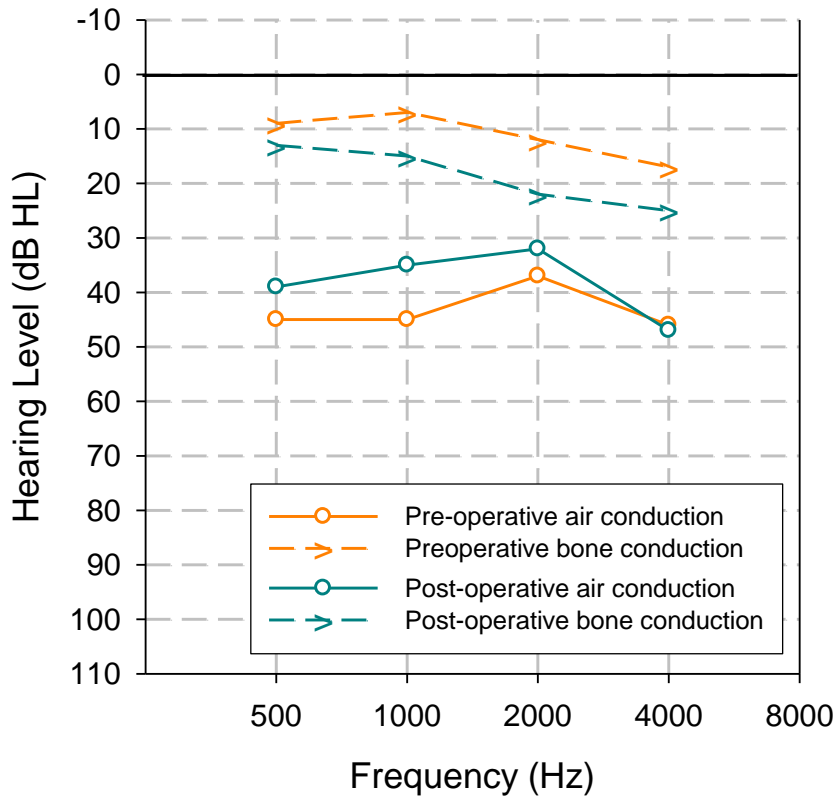


Titanium PORP

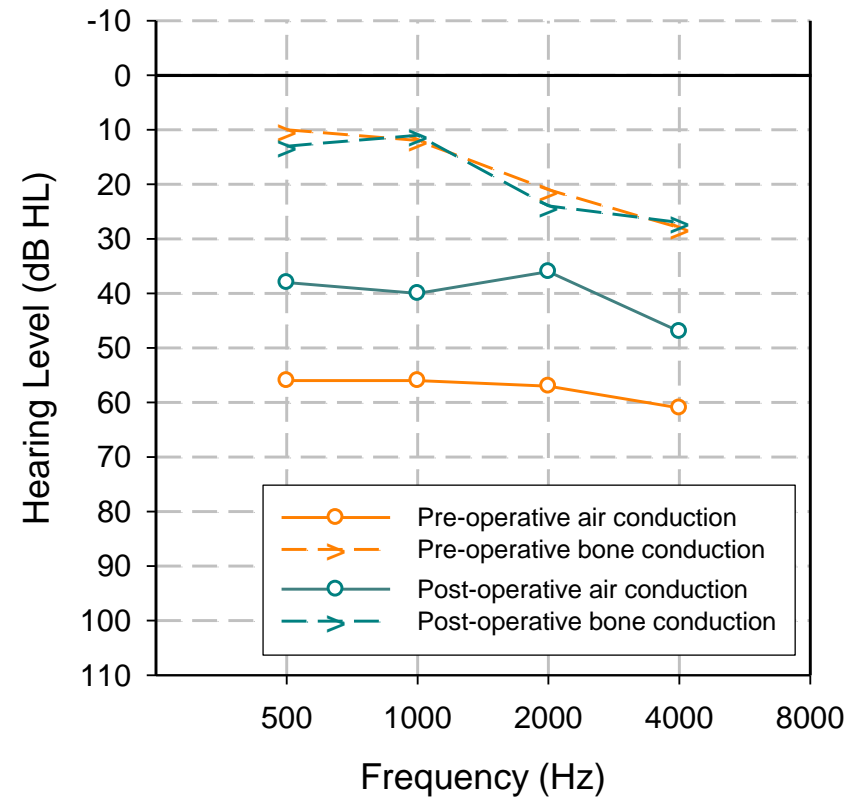


Results – hearing reconstruction type III / TORP

Autologous TORP



Titanium TORP



Results – Gain*

| | Autologous incus | Titanium | Total |
|-----------------|------------------|----------|-------|
| Type II / PORP | 15 (39)# | 13 (23) | 62 |
| Type III / TORP | 5 (17) | 18 (17) | 34 |
| Sum | 63 (56) | 44 (40) | 96 |

* *Gain = post-op – pre-op differences in PTA (0.5, 1, 2, 4 kHz)*

parentheses are numbers of observations

Discussion

- Extrusions are few around 5 %
 - can probably be improved
- Hearing results are even among groups
 - possibly with better hearing for Type III for titanium compared with autologous
- Points to future randomised prospective trials

Discussion

| Reference (year) | Type | Ossikulo-plasty | Mean Follow-up period | preop ABG | postop ABG | Pos ≤ 20 No(|
|----------------------|-----------------------------|---|-----------------------|----------------------|----------------------|---------------------------------|
| Fong et al. (2010) | Retrospective/Prospective | Titanium PORP Non-titanium TORP Titanium TORP | 1year | - 26 - 25 | - - - | 27(4) 8(4) 33(9) 1(9) |
| Neudert et al.(2009) | Retrospective | Titanium PORP Non-titanium PORP | 38,9mo | 26 25 | 17 19 | |
| Yung et al. (2010) | Randomized controlled trial | Titanium PORP Non-titanium TORP Titanium TORP | 2years | 29 33 24 33 | 16 12 12 20 | 15(4) 21(4) 21(4) 9(5) |

Results – Gain – all numbers*

| | Autologous incus | Titanium | Total |
|-----------------|------------------|-----------------|-------|
| Type II / PORP | 40-25 = 15 (39) | 37-24 = 13 (23) | 62 |
| Type III / TORP | 43-38 = 5 (17) | 58-40 = 18 (17) | 34 |
| Total | 63 (56) | 44 (40) | 96 |

**parentheses are numbers of observations*

Gain = post-op – pre-op differences in PTA (0.5, 1, 2, 4 kHz)

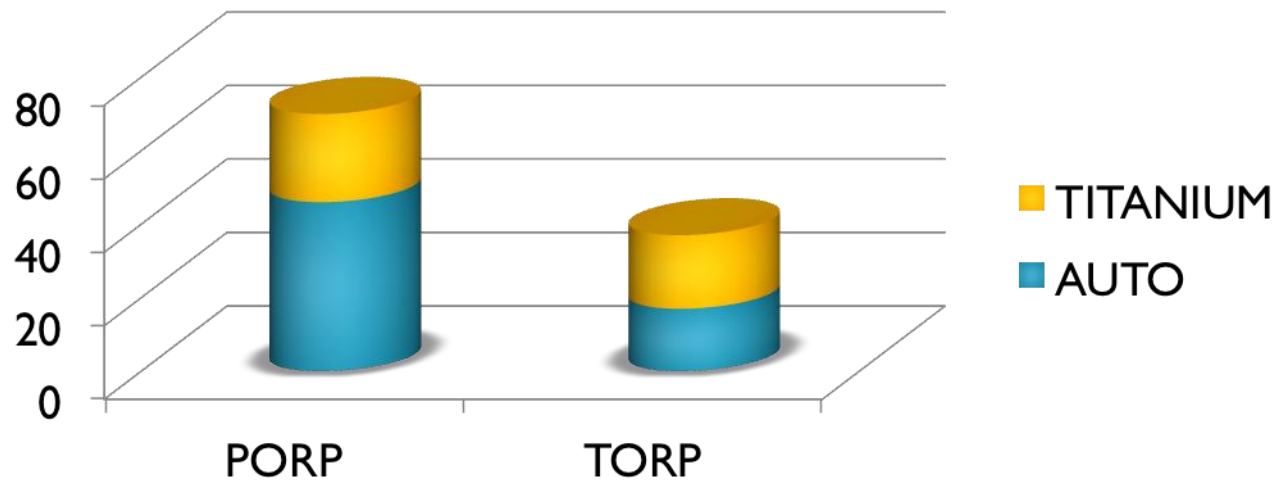
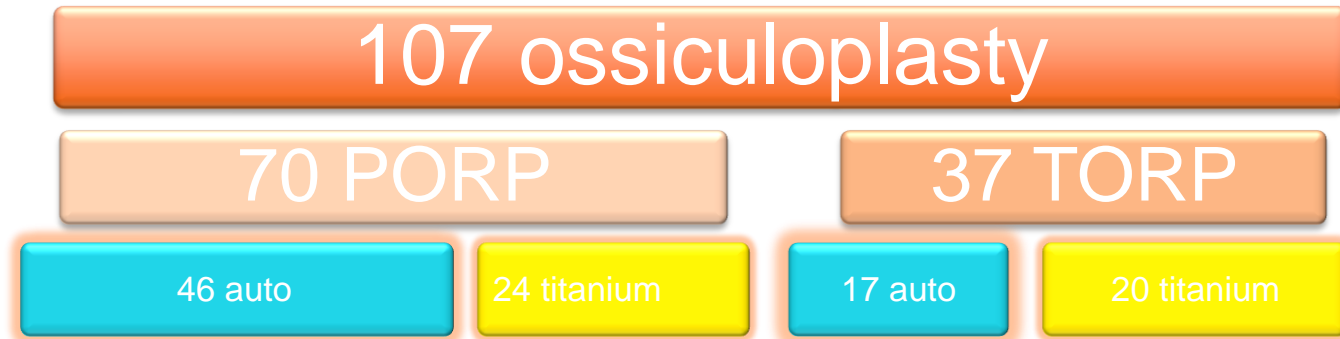
Discussion

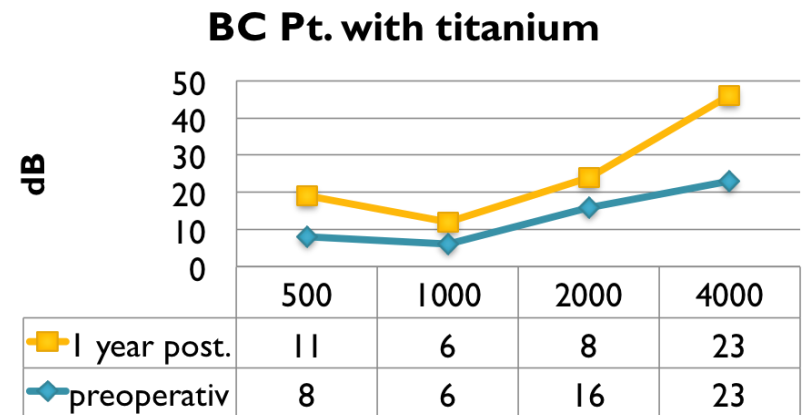
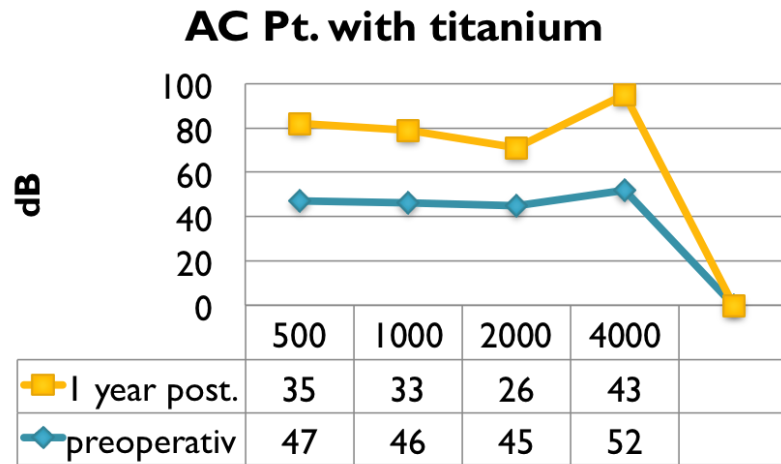
| | ABG | | AC | | |
|---|-----|------|-----|------|--|
| | pre | post | pre | post | |
| St.1 titanium (Fong et al. 2010) | - | - | - | - | |
| non-titanium | - | - | - | - | |
| St.2 titanium (M.Neudert et al.2009) | 26 | 17 | 54 | 44 | |
| non-titanium | 26 | 19 | 52 | 37 | |
| St.3 titanium | | | | | |
| non-titanium | | | | | |
| Our results titanium | 28 | 24 | 37 | 34 | |
| non-titanium | 27 | 23 | 40 | 36 | |

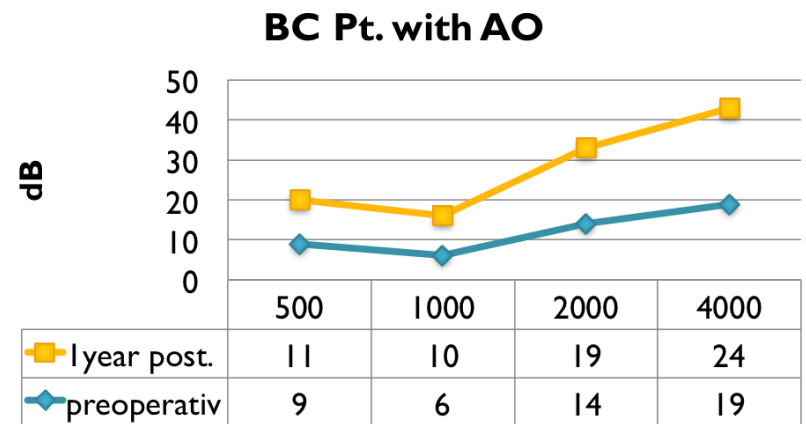
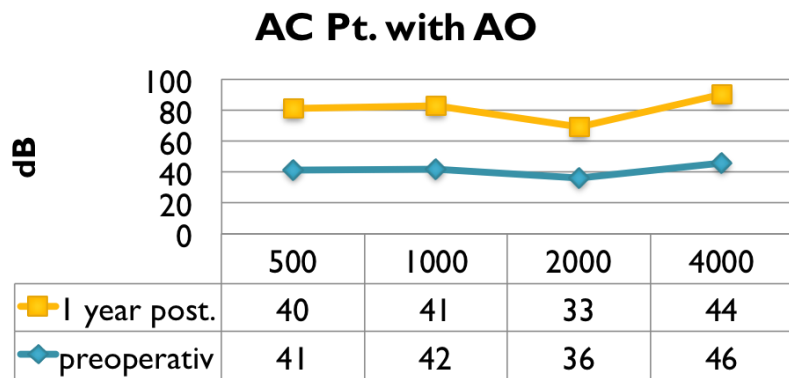
Discussion

| | ABG | | AC | | |
|-------------------------------------|-----|------|-----|------|--|
| | pre | post | pre | post | |
| St.1 titanium Fong et al. | 26 | - | - | - | |
| non-titanium | 25 | - | - | - | |
| St.2 titanium (M.Neudert et al.) | | | | | |
| non-titanium | | | | | |
| St.3 titanium | | | | | |
| non-titanium | | | | | |
| Our results titanium | 40 | 32 | 58 | 50 | |
| non-titanium | 32 | 26 | 43 | 44 | |

Results

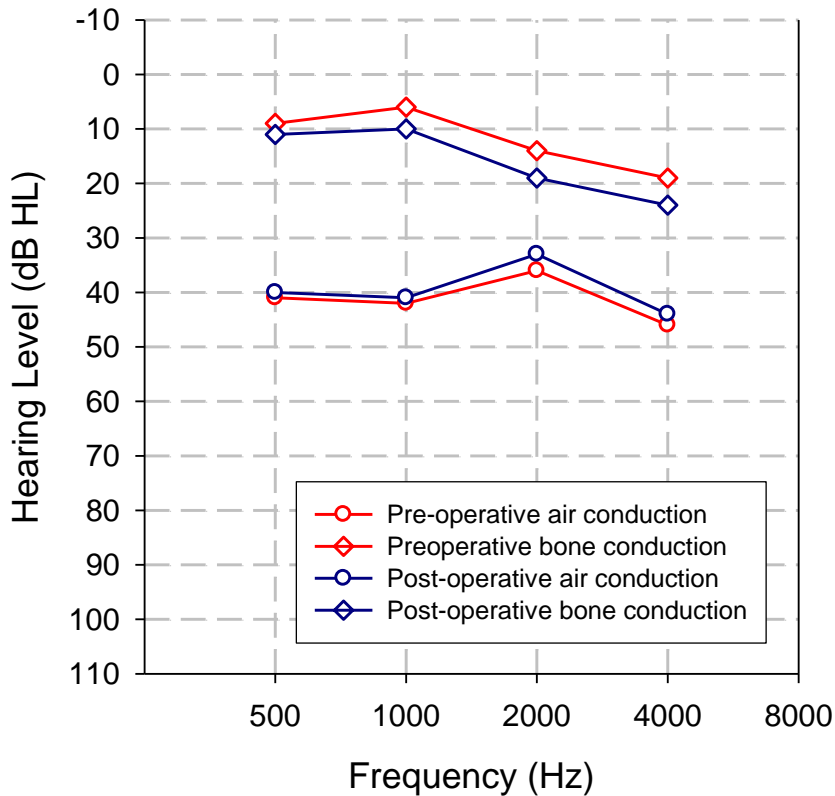




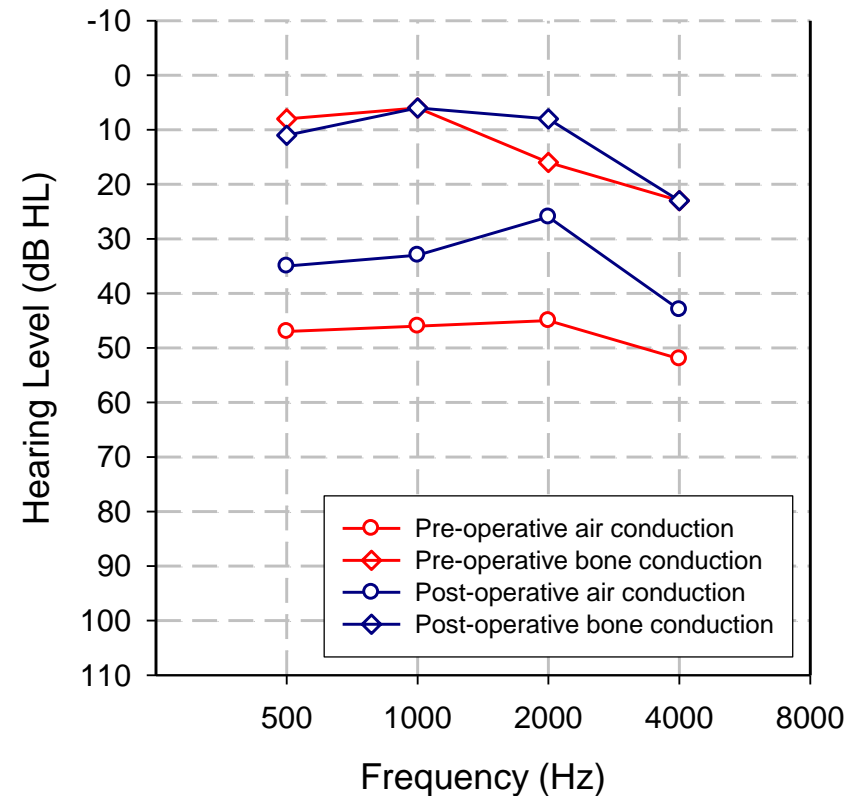


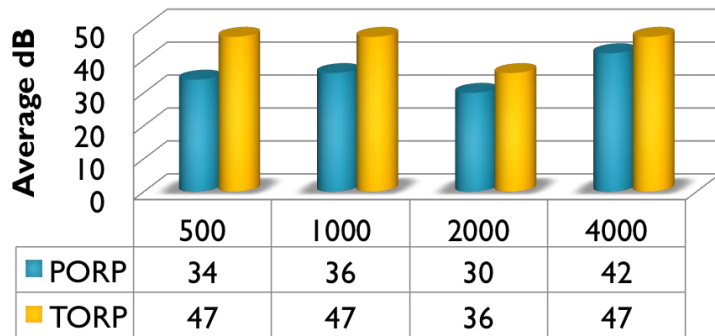
Results – hearing total for PORP and TORP's

Autologous PORP+TORP

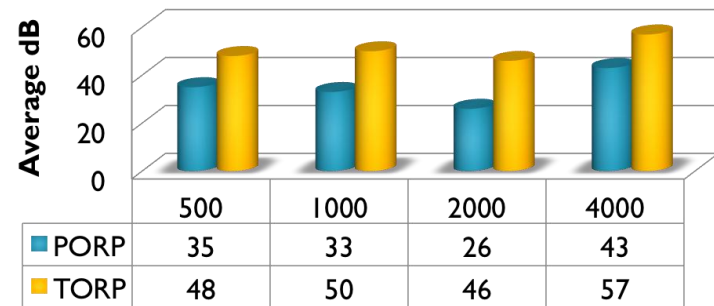


Titanium PORP+TORP



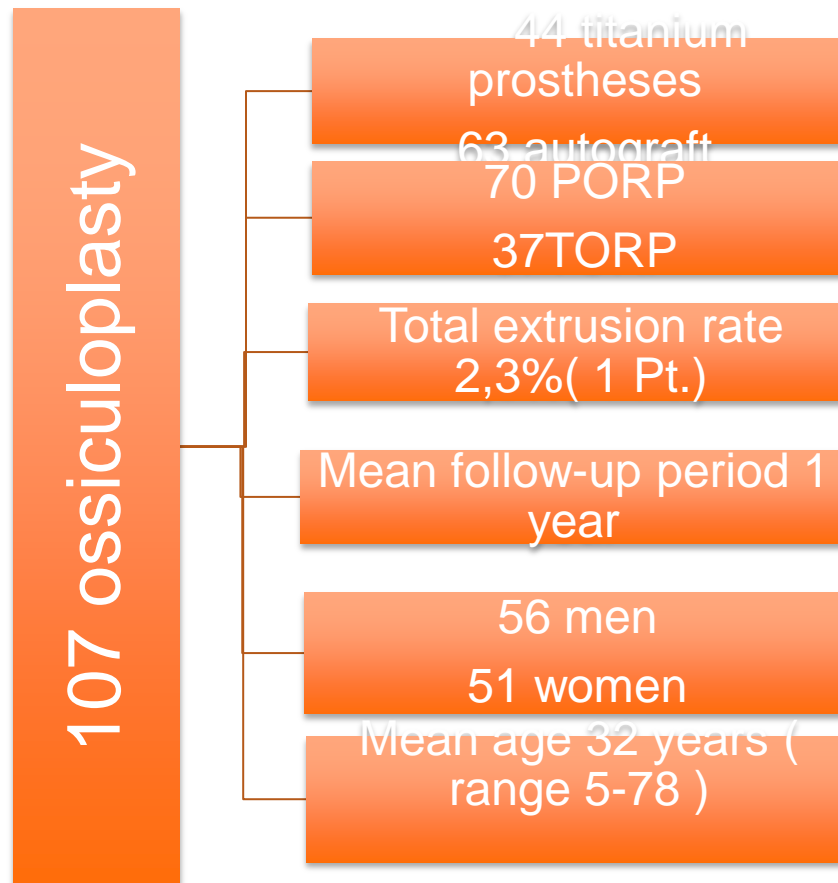


Postoperative AC gain at each frequency in the two groups of patients with autograft



Postoperative AC gain at each frequency in the two groups of patients with titanium implants

Methods and Materials



Results – ABG closure – Table needs revision

| | <i>Autologous incus</i> | <i>Titanium</i> | <i>Sum</i> |
|------------------------|-------------------------|-----------------|------------|
| <i>Type II / PORP</i> | 46 (39) | 24 (23) | 70 (62) |
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