

Outcome Measures: Early (<1 year after surgery), intermediate-term (1–5 years after surgery) and long-term (>5 years after surgery) post-operative audiometric data.

Results: Hearing results were assessed in all patients with 1 year of longer of audiometric follow-up. Despite worse pre-operative hearing (average intermediate PTA-ABG was 30.2 dB vs. 32.3 dB, respectively; $p = 0.0421$), there was no significant difference between adults and children for early post-operative (average early post-op PTA-ABG [pure tone average air-bone gap] was 18.2 dB vs. 19.6 dB, respectively; $p = 0.306$), intermediate (average intermediate PTA-ABG was 18.4 dB vs. 19.7 dB, respectively; $p = 0.235$), or long-term hearing result (average final PTA-ABG was 18.6 dB vs. 19.4 dB, respectively; $p = 0.439$). There was a significant improvement from pre-op to post-op and long-term PTA-ABG for all comparisons ($p < < < 0.01$). Additionally, the rate of air-bone gap closure to less than 20 dB was not significantly different (63.1% vs. 58.0% for adults vs. children, respectively; $p = 0.282$).

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Long-term results of chronic ear surgery (R711)

ID: 711.4

Surgical treatment of adult and paediatric cholesteatoma – a comparison of 6 years follow-up

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Learning Objectives: The consistent performed and longterm follow-up after cholesteatoma surgery is essential for the evaluation and a prerequisite for a comparison of the surgical results.

Introduction: The aim with the study was to present and compare data from two separate studies of a 6-years follow-up after cholesteatoma surgery in adults and children.

Material and methods: 301 adult- (330 ears) and 57 paediatric patients were operated for cholesteatoma. In all cases an identical one-stage canal-wall down-technique with reconstruction of the middle ear and mastoid obliteration using autologous bone was used. In the adult group 47% had previous surgery, in the paediatric group 7%.

After surgery a standardized protocol for documentation of the intra- and postoperative findings and surgical steps including a sketch and the preoperative audiometric data -pure tone average (PTA) for air- and bone conduction threshold levels (0.5–3kHz) - were registered in the data based follow-up-program. All patients were examined annually after surgery and the surgical and the audiometric data fed into the program 1, 3 and 6 years after surgery.

Results: In the adult group residual disease was found in 3%, in the paediatric group in 5%. The recurrence rate was 10% and 12%. Chain revisions were performed in 19% and

14%. The rate of the postoperative water resistance was 5% and 7%, the postoperative infection rate 3% and 0%.

Long lasting improvement and/or preservation of hearing were obtained in both groups. The pre-and post-operative air conduction hearing levels were 45.8 dB and 35.8 dB in the adult group, in the paediatric group 33 dB and 25.5 dB.

Conclusions: Independent of preoperative middle ear condition, cholesteatoma extent and localization, the used surgical technique provided a long-term improvement of hearing with a low incidence of residual and recurrent disease. No differences in outcome between adult and children were found.

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Free Papers (F712)

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Effects of intensive microscopic work on neck and back strain and the benefits of a prototype ergonomic chair

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Learning Objectives:

Introduction: Musculoskeletal pain is a common occupational hazard experienced by surgeons. Within the ENT community, Otolologists have been noted to experience the most neck and back pain, possibly related to prolonged microscopic work.

Aims:

1. To investigate the effects of sustained microscopic work on the neck and back and its correlation to surgical experience
2. To assess the benefits of a prototype ergonomic chair during prolonged microscopic work

Methods: A crossover study was performed on 10 male ENT clinicians using a standard operating chair and a prototype ergonomic support chair. We used a subjective measure of time to fatigue and pain for the neck and back as well as objective readings from a surface electromyogram (sEMG).

Results: Surgeon experience (years) was correlated with the time (sec) to fatigue at the neck ($R = 0.91$, $p < 0.001$) and back ($R = 0.76$, $p = 0.01$) as well as time to pain at the neck ($R = 0.74$, $p = 0.01$) and back ($R = 0.78$, $p < 0.01$) when the standard chair was used. Group mean time to onset of neck fatigue was 348s, neck pain was 846s, back fatigue was around 502s and back pain was 821s. The prototype ergonomic support chair significantly delayed the sensation of neck fatigue ($+672 \pm 520s$, $p < 0.01$) and neck pain ($+427 \pm 467s$, $p = 0.017$) and also eliminated the

difference seen amongst the varying seniority of clinicians. These findings were corroborated by the sEMG readings.

Conclusions: ENT surgeons who perform prolonged microscopic work are at risk of musculoskeletal pain, which correlates with surgical experience suggesting an element of postural adaptation. Our prototype ergonomic support system can help delay the sensations of postural strain.

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Free Papers (F712)

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Endoscopic management of cholesteatoma with Khan's Endoholder

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Learning Objectives: Endoscopic ear surgery provides a minimally invasive approach to the middle ear. The disadvantage of endoscopic ear surgery is that it is a single-handed surgical technique. The nondominant hand of the surgeon is utilized for holding and manipulating the endoscope. This necessitated the need for the development of an endoscope holder that would allow both hands to be free for surgical manipulation. The aim of this article is to report our preliminary experience using our newly designed and developed endoscope holder, which allowed us to perform cholesteatoma surgery utilizing both hands for surgery.

Study Design: Retrospective nonrandomized clinical study.

Methods: The endoscope holder was designed and developed to aid in endoscopic cholesteatoma surgery and to overcome the disadvantage of single-handed endoscopic surgery. The design of the endoscope holder is described in detail, along with instructions on how it can be used. A total of 87 endoscope holder-assisted cholesteatoma surgeries were performed to evaluate the feasibility of a two-handed technique and to evaluate the results of surgery.

Results: Out of 87 Endoholder assisted cholesteatoma surgeries, 82 surgeries were performed exclusively with Endoholder and 5 needed combined approach (endoscope + microscope) suggesting 94% success in using exclusive Endoholder for endoscopic management of cholesteatoma.

The endoscope holder eliminates the disadvantages of single-handed surgery and is a good option for those who wish to perform endoscopic cholesteatoma surgery using both hands.

Conclusion: The study reports the successful application and use of the endoscope holder in a two-handed technique of endoscopic cholesteatoma management.

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Free Papers (F712)

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Long term hearing outcomes with the shape memory Nitinol stapes prosthesis: 10 year results

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Learning objectives:

1. Understand the variability that ensues during crimping of stapes prostheses
2. Understand the benefits conferred by self-crimping shape memory prostheses
3. Learn about long term stability of hearing outcomes using self-crimping shape memory prostheses

Introduction: Self-crimping stapes pistons were introduced to remove the manual component of the crimping process during stapedectomy with a view to producing stable long term hearing improvement in a reproducible manner and reducing trauma to the middle and inner ear. The objective of this study was to assess the long term clinical hearing outcomes and their stability following stapedectomy using a self-crimping shape memory Nitinol prosthesis over a 10 year period.

Methods: Retrospective case review was performed in a tertiary referral centre. Thirteen adult patients underwent fourteen stapedectomy procedures using a self-crimping shape memory Nitinol prosthesis between November 2003 and February 2005. Pure tone audiometry was performed preoperatively, at three monthly intervals up to two years and at five and ten years postoperatively.

Results: Mean postoperative air conduction (0.5, 1, 2 and 3kHz) was 24.4 dB (standard deviation 8.3) at 1 year and 29.6 dB (11.2) at 10 years. Mean postoperative bone conduction (0.5, 1, 2 and 3kHz) was 18.6 (8.0) at 1 year and 25.0 (12.0) at 10 years. Mean postoperative air bone gap (0.5, 1, 2 and 3kHz) was 5.5 dB (3.0) at 1 year and 4.8 dB (3.9) at 10 years. Mean air bone gap closure was 23.3 (12.6) at 1 year and 24.2 (9.9) at 10 years. Mean change in high tone bone conduction level (1, 2 and 4kHz) was 5.4 dB (6.0) at 1 year and -0.2 dB (7.0) at 10 years, a mean deterioration of 5.6 dB (0.6 dB per year).

Conclusions: Excellent closure of the air bone gap is demonstrated and it remains stable over at least ten years. There is no evidence that circumferential firm fixation of the prosthesis hook around the long process of incus has a detrimental effect in the long term.