Program – DOKS 47. Årsmøde, Hesselet, 10.-11. september 2024

Tirsdag den 10. september

12.00-13.00	**Ankomst og stående frokost i udstillingssalen**	
13.00-13.30	Morten Høgsbro Formand DOKS	Velkomst og udstillerrunde
13.30-14.15	Michael Gaihede[1]	Middle ear pressure – Overall clinical impact of impaired regulation
14.15-14.45	**Kaffepause og udstilling**	
14.45-15.30	Saku Sinkkonen[2]	Comprehensive clinical assessment of Eustachian tube dysfunction patient
15.30-16.45	**Pause og udstilling?**	
16.45-18.00	**Generalforsamling** Dagsorden: 1. Valg af dirigent, 2. Formanden aflægger beretning, 3. Kassereren aflægger revideret regnskab og kontingent for næste år vedtages 4. Valg af bestyrelse i henhold til §6 5. Repræsentanter for Selskabets forskellige råd og udvalg aflægger beretning 6. Opstilling af kandidater og valg af råd og udvalg, 7. Valg af revisor og revisorsuppleant i henhold til §14 8. Revision af KKR 9. Eventuelt.	
19.00	**Samling til Drinks**	
19.30	**Middag**	

Onsdag den 11. september

07:00-08.30	**Morgenmad**	
08.30-09.15	Saku Sinkkonen[2]	Long-term outcome of Balloon Eustachian tuboplasty
09.15-09.45	**Kaffepause og udstilling – Husk at aflevere nøglen**	
09.45-10.00	Anders Britze[3]	Udredning og behandling af tubadysfunktion i Danmark – en rundspørge
10.00-10.15	Kasper Linde[4]	Non-intrusive, long term monitoring of middle ear health (p4)
10.15-10.30	Niels Holm[5]	Fusing MRI and CBCT: a key to explaining the cause of Eustachian tube dysfunction? (p5)
10.45-11.00	Steven A. W. Andersen[6]	Dynamisk cone-beam CT af mellemøret til udmåling af øreknoglernes bevægelse: teknisk proof-of-concept (p6)
11.00-11.15	**Pause**	
11.15-11.30	Dennis Friis Jensen[5]	Danish cohort study of tympanic membrane retractions and Eustachian tube dysfunction manifestations (p7)
11.30-11.45	Lars Juul Hansen[7]	Cholesteatoma – Operation or Observation? (p8)
11.45-12.00	Helene Andresen Ravn[7]	Increased Risk of Cholesteatoma in Alpha 1 Antitrypsin Deficiency. (p9)
12.00-12.15	Jonathan Hansen[6]	Isolerede malleusfrakturer - Diagnose, kirurgisk behandling og udbytte? (p10)
12.15-12.30	Joachim Aidt Becker[6]	Sjælden øregangscancer - et ceruminøst adenokarcinom (p11)
12.30-13.00	**Frokostpause – Sandwich i udstillerlokalet**	
13.00-13.20	Beretning fra studierejse (Susan Jacobsen/Christian Faber). Beretning om sidste års rejselegater (Steven Andersen/Anders Britze). Annoncering af vinder af quiz (Bjarki Djurhuus)	
13.20-13.45	Morten Høgsbro Formand DOKS	**Afrunding og forslag til næste års tema**
13.45	**Afslutning og frokost/sandwich to-go**	

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Non-intrusive, long term monitoring of middle ear health

Kasper Linde[1], Sebastian Udholm[2], Jakob Korsholm[3], Thomas Quist Barret[3], Jonas Holm[3]

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Diagnostik af tubadysfunktion er fortsat et emne hvor der mangler konsensus og objektive data. I et forsøg på at skabe en ny guldstandard for diagnostik af tubadysfunktion forsøger oplægsholderen at udvikle en "Holtermonitor til øret".

Kontinuerlig monitorering af mellemøretryksudvikling har tidligere været forsøgt anvendt for at kunne karakterisere tuba auditivas trykudlignende funktion (Tideholm et al., 1996; B. Tideholm, B. Carlborg, S. Jönsso, 1998; Gaihede et al., 2013). Det har ligeledes været forsøgt at anvende kontinuerlig impedansmåling til at karakterisere tuba auditiva som enten obstrueret, patuløst eller normalt fungerende (Meyer et al., 2018).

Hidtidige metoder har dog enten krævet anvendelsen af et trykkammer eller at subjektet skulle gennemgå en operation førend der kunne opsamles kontinuerlige data af tuba auditivas trykudlignende funktion.

Den undersøgte hypotese er at vi, ved at opsamle kontinuerlige impedansmålinger af trommehinden, vil kunne identificere synk, der medfører en åbning af det eustatiske rør samt synk, der ikke medfører en åbning af det eustatiske rør.

En afklaring af ovenstående hypotese vil kunne bidrage med ny viden, der kan anvendes til udvikling af nye produkter til diagnostik af tubadysfunktion (manglende evne til at vedligeholde et stabilt mellemøretryk) og muliggøre en bedre diagnostik og rettidig intervention.

Der vil blive præsenteret præliminære data fra ovenstående igangværende eksplorative case-kontrol forsøg. Det afsøges hvorvidt kontinuerlig akustisk impedans måling af trommehinden muliggør

1. Automatisk detektion af synk. De præliminære data tyder på en sensitivitet på 92-98% og PPV på 52- 70%.
2. Klassifikation af synk som:
    a. Medførende en åbning af det eustatiske rør.
    b. Ikke-medførende en åbning af det eustatiske rør.

Interessekonflikter: Kasper Linde er medejer af Zeta Diagnostics ApS, der udvikler teknologien og finansierer ovenstående forsøg.

B. Tideholm, B. Carlborg, S. Jönsso (1998) 'Continuous Long-term Measurements of the Middle Ear Pressure in Subjects without a History of Ear Disease', Acta Oto-Laryngologica, 118(3), pp. 369–374. Available at: https://doi.org/10.1080/00016489850183458.

Gaihede, M. et al. (2013) 'Eustachian tube pressure equilibration. Temporal analysis of pressure changes based on direct physiological recordings with an intact tympanic membrane', Hearing Research, 301, pp. 53–59. Available at: https://doi.org/10.1016/j.heares.2013.01.003.

Meyer, M.F. et al. (2018) 'Analyzing eustachian tube function in patients with symptoms of chronical Eustachian tube dysfunction by pressure chamber measurements', European Archives of Oto-Rhino-Laryngology, 275(5), pp. 1087–1094. Available at: https://doi.org/10.1007/s00405- 018-4938-z.

Tideholm, B. et al. (1996) 'Continuous 24-hour Measurement of Middle Ear Pressure', Acta Oto-Laryngologica, 116(4), pp. 581–588. Available at: https://doi.org/10.3109/00016489609137893

Fusing MRI and CBCT: a key to explaining the cause of Eustachian tube dysfunction?

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Aim
The aim of this study is to identify anatomical structures associated with Eustachian tube dysfunction (ETD) using imaging.

Methods
Cone Beam CT (CBCT) scans visualizes bone extremely accurate, while magnetic resonance imaging (MRI) is superior when visualizing soft tissue. Therefore, 3 Tesla MRI and CBCT images will be fused to give the best visualization of the entire tube. Any differences in dimensions or angles compared to healthy controls or the non-symptomatic contralateral side, could aid in clarifying a potential anatomical correlation to ETD.

Results
A total of 28 patients with chronic ETD and 10 healthy controls has been enrolled in the study.

Conclusion and perspectives
To the present date, preliminary data is being processed. The final results are expected to be ready for the presentation.

Dynamisk cone-beam CT af mellemøret til udmåling af øreknoglernes bevægelse: teknisk proof-of-concept

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Formål
Konduktivt høretab kan skyldes ossikel fiksation eller diskontinuitet. Nuværende ikke-invasive metoder som tympanometri og konventionel billeddiagnostisk kan indikere mobilitet og/eller patologi men kan ikke bruges til specifikt at kvantificere øreknoglekædens bevægelighed. Formålet med dette proof-of-concept studie er at undersøge den tekniske feasibility af dynamisk cone-beam CT (CBCT) af mellemøret som en ny metode til at kvantificere mobiliteten af malleus og incus.

Materiale og metoder
Vi foretog 360-graders CBCT scanning med lille field-of-view omkring mellemøret og isotropisk opløsning på 0.08 mm af fem kadaverhoveder (10 ører) og anvendte et tympanometer til at tryksætte trommehinden (-400 til +300 daPa). Derefter foretog vi manuel segmentering af malleus og incus i scanningsbillederne og eksporterede de segmentede volumina til software, hvor vi kunne visualisere og udmåle bevægelsen af manubrium mallei og crus longum incudis.

Resultater
Det var teknisk muligt at ændre trykket midtvejs under scanningen og anvende 180-graders virtuelle rekonstruktioner af hhv. den negative og positive trykfase til at kvantificere mobiliteten af malleus og incus. For ører med normal bevægelighed af trommehinden (A kurve ved tympanometri), fandt vi en gennemsnitlig bevægelse af manubrium mallei på 0.61 mm og af crus longum incudis på 0.27 mm. Disse udmålinger stemmer godt overens med litteraturen. For ører uden bevægelse af trommehinden (B kurve) fandt vi som forventet ingen sikker bevægelighed af øreknoglerne.

Konklusion
Dynamisk CBCT af mellemøret kan bruges til at kvantificere bevægeligheden af malleus og incus i ører med normal impedans af trommehinden. Metoden kan bidrage yderligere information sammenholdt med statisk billeddiagnostik ved atmosfærisk tryk og andre in vivo metoder som fx wideband tympanometri. Yderligere studier skal dog validere den kliniske værdi af metoden.

Danish cohort study of tympanic membrane retractions and Eustachian tube dysfunction manifestations

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Objectives

Our objective is to evaluate the prevalence of TM retractions and management of signs of ETD in both children and adults following type 1 tympanoplasty or myringoplasty. Furthermore, to identify potential risk factors for developing ETD and TM retractions.

Methods

Retrospective cohort study of 423 patients (5 -86 years of age) undergoing 452 procedures. We extracted data from electronic patient journals during scheduled consultations to calculate prevalences and relative risks. The project was reported to The Danish Data Protection Authority, and access to electronic patient journals was approved by the Institutional Board of Gødstrup Hospital.

Results

At one year postoperative follow-up, the prevalence of tympanic membrane retractions and Eustachian tube dysfunction manifestations was 16.8%, with tympanic membrane retractions accounting for 12.7%. Risk factors for developing tympanic membrane retractions included preoperative myringosclerosis, history of ipsilateral ear surgery, posterior perforations, and use of perichondrium graft. Conversely, previous contralateral ear surgery and temporal fascia graft use were associated with decreased risk. Eustachian tube dysfunction manifestations were significantly increased in cases of preoperative bilateral perforation, history of ipsilateral ventilation tube, and traumatic tympanic membrane perforation.

Conclusions

Almost 28% of the cohort experienced postoperative unforeseen manifestations: TM retractions 12.7%, other ETD manifestations 4.2% and graft failure 11.0%. The dynamic nature of these complications necessitates diligent follow-up strategies.

Keywords

Tympanic membrane retractions, Eustachian tube dysfunction, Type 1 tympanoplasty, Myringoplasty, Postoperative manifestations.

Cholesteatoma – Operation or Observation?

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Approximately 1 % of the population suffer from eustachian tube dysfunction. Common symptoms include aural fullness, reduced hearing, and inability to alleviate negative middle ear pressure through Valsalva's maneuver. The condition may also cause retraction of the tympanic membrane, secretory otitis media and eventually cholesteatoma. The prevalence of cholesteatoma in developed countries is around 6-9 pr. 100.000 inhabitants, and around 70% of people with chronic middle ear problems including cholesteatoma suffer from eustachian tube dysfunction.

The management of cholesteatoma is generally either observation or surgery. However, when exactly is surgery necessary? When does a so-called "pre-cholesteatoma" become a cholesteatoma? When is a retraction unsafe? In this presentation, a series of cases will challenge the decision on whether to operate or not. I hope that the management of cholesteatoma in different departments in Denmark are shared through fruitful discussion. The cases have all been recorded at the Ear, Nose and Throat department at Zealand University Hospital, Køge.

Increased Risk of Cholesteatoma in Alpha 1 Antitrypsin Deficiency

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Background: Alpha-1 antitrypsin (AAT) deficiency is known to cause chronic obstructive pulmonary disease due to degradation of the elastic fibers in lung tissue. We hypothesized that similar degradation could occur in the elastic fibers in the tympanic membrane and tubae auditivae, potentially increasing the risk of retraction pockets and cholesteatoma.

Objective: To estimate the risk of cholesteatoma in patients with AAT deficiency compared to the general population using time-to-event analysis.

Methods: We conducted a retrospective cohort study using data from three different registers: the Danish AAT Deficiency Registry, the Danish National Patient Registry (LPR) and the Danish Civil Registration System (CPR). All patients in the AAT database were included, and a control group was matched 1:10 from the Danish population. Hazard ratios (HR) were calculated using Cox regression analyses, with age as the underlying time variable.

Results: The study included 2,702 individuals with AAT deficiency and 26,750 controls matched on sex, age, and municipality. The analyses found that individuals with AAT deficiency had a 3.6-fold higher risk of cholesteatoma surgery (95% CI: 1.9 – 6.8) and a 1.4-fold higher risk of non-cholesteatoma surgery (95 % CI: 1.04 – 1.89) compared to the general population.

Conclusion: AAT deficiency is associated with a 3.6 times increased risk of cholesteatoma. This underscores AAT's protective role in the middle ear and highlights the potential for future research into prevention and treatment of cholesteatoma. The findings also ads knowledge to the understanding of the pathophysiology of cholesteatoma.

Isolerede malleusfrakturer - Diagnose, kirurgisk behandling og udbytte?

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Isolated malleus fractures are a rare occurrence with few reported cases in the literature. Symptoms include sudden otalgia, hearing loss, tinnitus and aural fullness. Work-up and diagnosis are based on a combination of thorough anamnesis and careful otoscopic evaluation or high-resolution computer tomography. We present a couple of cases of isolated malleus handle fractures who were diagnosed based on a combination of pneumatic otoscopy and tympanometry. Both fractures were surgically repaired using hydroxyapatite bone cement as showcased in the video recording. Post-operative audiometry showed improvement in the pure-tone-average of both patients as well as normalisation of tympanometry.

Isolated malleus fracture should be suspected in cases of sudden hearing loss and tinnitus following digital manipulation of the outer ear canal together with a conductive hearing loss with a mostly high-frequent air-bone-gap and hypercompliant tympanometry with hypermobility of the tympanic membrane on pneumatic insufflation. Surgical repair of the fracture using bone cement has good hearing outcomes and leads to improvement in auditory symptoms.