Lessons Learned from Balloon Eustachian Tuboplasty after 5,000 Procedures

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Eustachian Tube Surgery?

Eustachian Tube Catheter Set by Von Tröltsch, Würzburg, 1877
Section of Otology
President—D. F. A. Neilson, F.R.C.S.

[November 3, 1950]

The Vulnerability of the Eustachian Tube

PRESIDENT’S ADDRESS
By D. F. A. Neilson, F.R.C.S.

(2) Irradiation.—This is best reserved for the elimination of swollen and degenerate lymphoid tissue on the lateral wall of the nasopharynx. It is, of course, necessary to stress that in the carrying out of this treatment it is essential to have the guidance of a competent radiotherapist. The dangers of overdosage have been stressed and are familiar to us all, in particular damage to the pituitary. On the other hand the intrinsic susceptibility to irradiation of lymphoid tissue is so much greater than that of other structures in the neighbourhood as to make it unlikely that any serious damage to this would occur, in particular if the treatment is carried out under the guidance of a radiotherapist.
Balloon Eustachian Tuboplasty (BET)

Balloon Dilation Eustachian Tuboplasty: A Feasibility Study

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Balloon Dilatation Eustachian Tuboplasty: A Clinical Study

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Holger H. Sudhoff, MD, PhD

Application of TubaVent® Balloon Catheter

Application of TubaVent® Balloon Catheter

TubaVent® Balloon Catheter
3D Reconstruction of BET

Joachim Butzlaff 2019
TubaVent® Balloon Catheter

Dimensions: 3 x 20 mm
at 10 bars: 3.3 mm

BET application in adults


Holger Sudhoff
BET application in adults

BET application in adults

BET application in adults

Holger Sudhoff
Clinical application in adults

Part 1 – Positioning of the 70° Hopkins optic

Part 2 – Positioning of the microendoscope and catheter insertion

Part 3 – Balloon dilatation and removal of the microendoscope and catheter

Holger Sudhoff
Our long-term results suggest that BET is a safe and feasible treatment for chronic obstructive Eustachian tube dysfunction with a success rate of more than 70%. This study has important implications for other Eustachian tube-related clinical entities, such as glue ear management (adults and children), continued grommet insertion and tympanomastoid surgery outcomes.
This study demonstrated superiority of balloon dilation of the Eustachian tube with balloon catheter + medical management compared to medical management alone to treat Eustachian tube dilatory dysfunction in adults.
A Randomized Controlled Trial of Balloon Dilation as a Treatment for Persistent Eustachian Tube Dysfunction With 1-Year Follow-Up


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Balloon dilation is superior to continued medical management for persistent ETD.
Balloon dilation of the Eustachian tube: clinical experience in the management of 126 children

*Conclusions*

In our opinion, balloon dilation of the Eustachian tube is a safe and reliable alternative in the management of adults and especially children with chronic Eustachian tube dysfunction that does not respond to conservative/established therapies.
BET application in children

Sudhoff, H., Mittmann, P., Todt, I., In Vivo Measurement of Middle Ear Pressure Changes during balloon eustachian tuboplasty, BioMed Research International Article ID 9519204, 2018
Characteristic stages of middle ear pressure changes

Sudhoff, H., Mittmann, P., Todt, I., In Vivo Measurement of Middle Ear Pressure Changes during balloon eustachian tuboplasty. BioMed Research International Article ID 9519204, 2018
Dehiscent Internal Carotid Artery

Sudhoff, H., Mittmann, P., Todt, I., In Vivo Measurement of Middle Ear Pressure Changes during balloon eustachian tuboplasty, BioMed Research International Article ID 9519204, 2018
Problems

14-year old patient
2x adenoidectomy and 9x tympanoplasty left ear
Nasopharynx (Post-adenoidectomy)

right

left
Recanalization of the ET

55-year old female patient after bimaxillary advancement surgery
Recanalization of the ET

55-year old female patient after bimaxillary advancement surgery
Complications

3,670 BET procedures performed on 2,272 patients resulted in a rate of postoperative emphysema was 0.27% (95% CI 0.13–0.50%)
Current data

5,205 patients have been treated
Age range 1 – 86 years

→ No serious side effects (2 balloon pinhole ruptures)

→ Occ. minor tinnitus enhancement (5 Cases)

→ SSNHL (25dB) (1 Case / steroids)

→ Infrequent epistaxis

→ No patulous Eustachian tube

→ 289 revisions

→ 6 emphysemas
Rate of improvement

- Uncomfortable sensation of pressure in the ears especially with changes of atmospheric pressure (e.g. on an airplane)
- Inability to perform Valsalva’s manoeuver
- Chronic otitis media with effusion
- Middle ear atelectasis
- Recurrent middle ear diseases (e.g. perforation, cholesteatoma)
- Failed tympanoplasty (e.g. protruding middle ear prosthesis)
Lessons Learned

→ Safe and reliable method (app. 100,000 cases ww)

→ Patient selection criteria is key

→ Treating suspected cause of ET obstruction (inflammation, allergies, reflux)

→ Continued research especially in pediatric patients

→ Low incidence of complications

→ Improved result for tympanoplasty?
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