



# Balloon Eustachian Tuboplasty for Treatment of Otitis Media with Effusion in Radiated Patients.

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## Abstract

**Educational objective:** The participant should be able to discuss safety and feasibility of balloon Eustachian Tuboplasty (BET) for treatment of otitis media with effusion (OME) in patients who have received radiation.

**Objective:** To evaluate safety and feasibility of BET in patients with post radiation otitis media with effusion.

**Study design:** Retrospective chart review

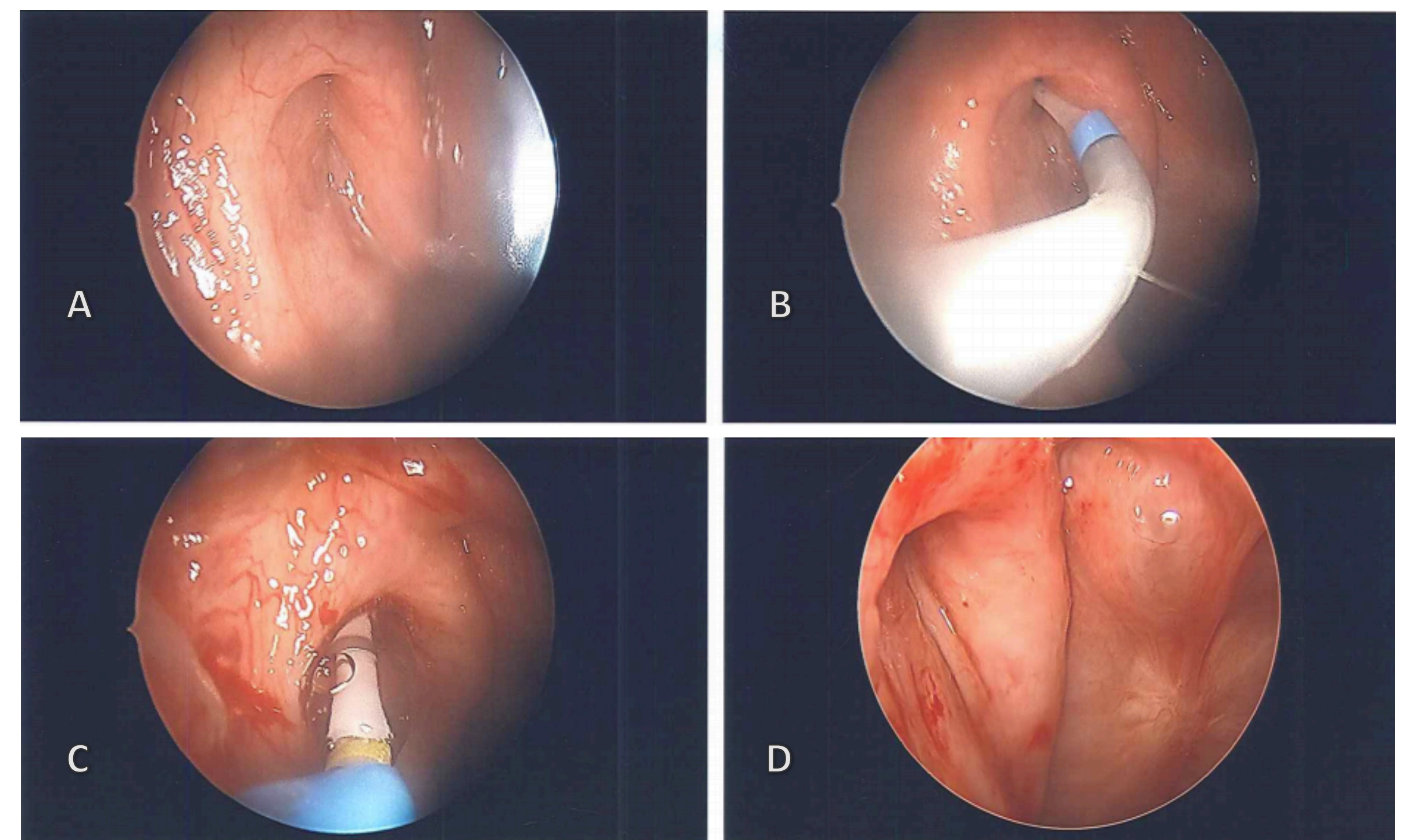
**Methods:** 4 ears (3 patients) underwent BET for post radiation OME. Inclusion criteria included adult >18 years old patients, history of recent radiation to skull base or nasopharynx, persistent (> 3 months) of middle ear effusion via exam and symptoms or tympanometry in an audiogram, and no current active carcinoma. The Eustachian Tube Dysfunction Questionnaire (ETDQ-7) was measured as primary outcome in pre and postoperative period.

**Results:** Out of 3 subjects, 2 had nasopharyngeal carcinoma and one had myxofibrosarcoma of the neck. They were all female with average age of 52 (range 39-61). Dosage of previous radiation was at least 60Gy (Range 60-70). Average duration of OME symptoms was 20 months (range 5-30 months). Subjects had retracted tympanic membrane and middle ear fluid on exam. Tympanometry was performed in 3 out of 4 ears, which was Type B. Only one ear had previously undergone ventilation tube placement for OME – despite tube placement, patient had persistent symptoms. Average duration of follow up was 3 month. Mean ETDQ-7 was 39.75 (range: 37-48) which significantly improved after balloon dilation of ET with an average of 14.25 (p.value :0.001).

**Conclusion:** The results show that BET can effectively improve ET function in post radiation OME with minimal risk. This technique provides these patients with limited options an alternative approach to relieve their symptoms without risk of chronic draining ears.

## Results

4 ears (3 patients) underwent BET for post radiation OME. Findings are summarized in table 1. Out of 3 subjects, 2 had nasopharyngeal carcinoma and one had myxofibrosarcoma of the neck. They were all female with average age of 52 (Range 39-61). Dosage of previous radiation was at least 60Gy (Range 60-70). Average duration of OME symptoms was 20 months (range 5-30 months). Subjects had retracted tympanic membrane and middle ear fluid on exam. Tympanometry was performed in 3 out of 4 ears which was Type B. Only one ear had previously undergone ventilation tube placement for OME – despite tube placement, patient had persistent symptoms. Average duration of follow up was 3 month. Mean ETDQ-7 was 39.75 (range: 37-48) which significantly improved after balloon dilation of ET with an average of 14.25 (p value: 0.001). No intra or post op complication was seen.



**Intraoperative photos of balloon eustachian tuboplasty. A) Pre dilation photo of stenotic right eustachian tube. B) The Reliva Solo Sinus Balloon Dilation System introduced into eustachian tube orifice. C) Balloon inflated. D) Post dilation photo showing patent right eustachian tube**

## Introduction

Post radiation otitis media with effusion (OME) due to eustachian tube dysfunction is a common complication after radiotherapy treatment in nasopharyngeal cancer (NPC) and sometimes in head and neck cancers (1). Tympanostomy tube placement is the most common surgical procedure for post radiation OME in head and neck cancers but it is associated with high rate of complications such as otorrhea in 43.5% of patients and permanent tympanic membrane perforation in 10% (2).

Balloon dilation of the cartilaginous ET or Balloon Eustachian Tuboplasty (BET) is a new surgical technique that has shown encouraging results. Ockermann (3) described the procedure in 2010 and since then there have been several studies showing promising results after this minimally invasive procedure(4)(5). However, none of these studies have specifically mentioned or targeted post radiation ETD and even one study has excluded these patients(6).

In this study for the first time we show safety and feasibility of BET for treatment of OME in patients who have received radiation.

## Method

The Stanford University Institutional Review Board approved this study. A retrospective review was performed on all patients who underwent balloon eustachian tuboplasty (BET) for treatment of otitis media with Effusion (OME) after radiation.

Inclusion criteria included adult >18 years old patients, history of recent radiation to skull base or nasopharynx, persistent (> 3 months) of middle ear symptoms of ear fullness, clogged sensation or muffled hearing, effusion via otologic exam, and visible narrowing of the Eustachian tube opening in the nasopharynx and no current active carcinoma. Pictures were taken before and after treatment. Audiogram with tympanometry was performed before and after. The Eustachian Tube Dysfunction Questionnaire (ETDQ-7) was measured as primary outcome in pre and postoperative period.

Senior author (J.Y.L) performed all procedures. The Reliva Solo Sinus Balloon Dilation System (length 16 mm, diameter 7 mm, Acclarent, Inc, Menlo Park, California, USA) was used for the procedure (Figure 1). Surgical technique described by Poe (4) was utilized to dilate eustachian tube.

**Table 1. Pre and postoperative findings**

Case number	1	2	3
<b>Age (year)</b>	61	39	58
<b>Sex</b>	Female	Female	Female
<b>Associated diagnosis</b>	Nasopharyngeal carcinoma	Nasopharyngeal carcinoma	Myxofibrosarcoma
<b>Side</b>	BL	R	R
<b>Duration of symptoms (month)</b>	24	30	5
<b>Dose of radiation</b>	70Gy	70Gy	60Gy
<b>Pre op tympanometry</b>	B (bilateral)	Not available	B
<b>Post op tympanometry</b>	A (bilateral)	C	A
<b>Pre op ETDQ-7</b>	37	37	48
<b>Post op ETDQ-7</b>	22	4	9

## Conclusion

To best of our knowledge, this is the first report of successful treatment of OME in radiated patient using balloon eustachian tuboplasty. The results show that BET can effectively improve ET function in post radiation OME with minimal risk. This technique provides these patients with limited options an alternative approach to relieve their symptoms without risk of chronic draining ears.

## Contact

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