Faculty Disclosure

The following presentation will not include discussion on any commercial products or service of the APSCI 2017.
Basic Surgical Anatomy for Cochlear Implantation

Haruo Takahashi, M.D.
Emeritus Professor
Nagasaki University, Japan
Contents

1. Anatomy of the round window niche (RWN)
2. Anatomy of the round window (RW) and its membrane (RWM)
3. Interrelations of the RW and its neighboring structures including the scala tympani of the cochlea related to cochlear implant (CI) surgery
RW and surrounding structures viewed from the direction during the CI surgery (left ear)

RW(M) is located deep inside the RWN.

(Modified from Takahashi H, et al, Laryngoscope 1990)
Round window viewed from posterolateral-inferior direction through the aperture of the niche (left ear)

The round window niche is shaped like an inverted pouch.

Variation in the shape of the RWN (left ear)

Variation was unexpectedly small.

Shortest distance from the aperture of RWN to the lateral margin of RWM

It is important to know how much we can drill the lateral bony overhang.

0.66 ± 0.16 mm

How much can we remove the bony overhang of the round window niche? (left)

The distance range from $0.34 - 0.98 \text{ mm}$!!

The RWM is convex in the coronal plane and concave in the sagittal plane, thus shaped like a saddle, tapered toward the vestibular end.  

Variation in the shape of the RW (left ear)

Shape was found to have considerable variety.

Tremendous variation in the shape of round window was shown.

Crista semilunaris (left ear)

Sagittal plane

It sometimes disturbs electrode insertion through the RW.

In case of round window insertion, the electrode should be advanced to antero-inferior direction.

Angle between the trajectory of electrode of facial recess approach and that of RW to bottom of the basal turn (upright position)

Angle between the trajectory of electrode of facial recess approach and the anteroinferior part of RW (upright position)

Structure of RWM
- special reference to RW incision -

Horizontal incision on the RWM may be smoother.

(Courtesy of Dr. Yasuya Nomura)
Summary

# RWN - pouch-shaped, variation +
# RWM - saddle-shaped, variation +++
# Crista semilunaris - where OSL meets margin of RW
# Electrode - advanced 16 degrees anterolateral from RW to bottom of basal turn scala tympani
# RW - facing the trajectory of electrode with 30 degrees
# RWM - Fibers run horizontally – horizontal incision
Thank you for your attention.