Cone Beam CT Images of Normal and Paralized Facial Nerves
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ABSTRACT
CT imaging of the normal facial nerve canal
CT imaging of the diseased facial nerve canal
Normal FCN
Accuitomo, was reported to project high-resolution images of minute bony structures in the skull, including the temporal bone. Herein, in the 28 normal adult temporal bones studied, the diameter of the bony facial canal was measured at the meatal foramen, the cochleariform process, and the stapes. The pyramidal eminence and emerging point of the cochleariform process, in the vertical segment of the canal had two narrow sites, one at the meatal foramen and the other at the level of the stapes. From the meatal foramen toward the cochleariform process, the canal gradually narrowed. From here the canal again became broader until it reached the stapes. Diameter measurements taken by CBCT were similar to those taken during cadaver dissection, suggesting that the CBCT imaging system can accurately represent the bony facial canal. The present study determined the correlation between the enlargement and the severity of the palsy, or denervation of the facial nerve. Further studies will be necessary to more accurately evaluate bone enlargement during the course of a disease.

RESULTS
Conclusions
CT imaging of the normal facial nerve canal
CT imaging of the diseased facial nerve canal
Figure 4 shows a representative CT image taken from a 50-year-female with RHS diagnosed 14 days post-onset with an electromyography (EMG) value of 6.1%. The image shows enlargement of the FNC at the cochleariform process and the stapes. (Fig. 4). CT measurements of diseased FCN showed significant enlargement of the meatal foramen and the cochleariform process. There were only identified at the cochleariform process. However, no significant difference was found for each disease.

METHODS AND MATERIALS
1. Point-specific measurements of FNC diameter using CT images
Five points of the inter-temporal FNC were selected as measuring points; 1) the meatal foramen, 2) the cochleariform process, 3) the stapes, 4) the pyramidal eminence, and 5) the emerging point of the chorda tympani in the vertical segment. These points were selected because of the presence of distinct landmarks and bone defects or enlargement, as well as a swelling and redness of the mucosa on the FNC. Common findings in the FNC during decompression surgery were bone defects or enlargement, as well as a swelling and redness of the mucosa on the FNC. The measurements were made in the left and right side. It was determined that significant correlations existed between the two sides at each measured point. (Table 1) Diameter of each points by CBCT or cadaver dissection. (Fig 2).

Conclusions
Diseased FCN
The present study describes how to obtain CT images of the FNC and provides measurements of the FNC in normal and pathological facial nerve cases. The present study determined the correlation between the enlargement and the severity of the palsy, or denervation of the facial nerve. Further studies will be necessary to more accurately evaluate bone enlargement during the course of a disease. 

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Fig 1. Images at the point of the stapes on the CBCT.

Fig 2. Diameter of each points by CBCT or cadaver dissection.

Fig 3A. scatter gram of the diameter plotted a relationship between the right and the left side. It was determined that significant correlations existed between the two sides at each measured point. (Pearson's correlation coefficient test)

Fig 4. CT imaging of the diseased facial nerve canal.

Fig 5. Images at the point of the stapes on the CBCT.

Fig 6. A scatter gram of the diameter plotted a relationship between the right and the left side. It was determined that significant correlations existed between the two sides at each measured point. (Pearson's correlation coefficient test)

Table 1. Values of ENoG and diameter of diseased facial nerve canal.

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<th>p Value</th>
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<tr>
<td>Normal</td>
<td>4.5 ± 1.2</td>
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