

# Recurrent unilateral facial nerve palsy in a child with dehiscence facial nerve canal

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## Abstract

**Objective:** The dehiscence facial nerve canal has been well documented in histopathological studies of temporal bones as well as in clinical setting. We describe clinical and radiologic features of a child with recurrent facial nerve palsy and dehiscence facial nerve canal.

**Methods:** Retrospective chart review.

**Results:** A 5-year-old male was referred to the otolaryngology clinic for evaluation of recurrent acute otitis media and hearing loss. He also developed recurrent left peripheral FN palsy associated with episodes of bilateral acute otitis media. High resolution computed tomography of the temporal bones revealed incomplete bony coverage of the tympanic segment of the left facial nerve.

**Conclusions:** Recurrent peripheral FN palsy may occur in children with recurrent acute otitis media in the presence of a dehiscence facial nerve canal. Facial nerve canal dehiscence should be considered in the differential diagnosis of children with recurrent peripheral FN palsy.

## Keywords

Recurrent facial nerve palsy, child, dehiscence facial nerve canal

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## Introduction

The dehiscence facial nerve canal (FNC), characterized by discontinuity in the bony structure of the FNC, is encountered in 0.5%–74% of the histologic studies of the temporal bone and the findings of ear surgery.<sup>1,2</sup> Congenital FNC dehiscence occurs due to failure of ossification centers.<sup>3</sup> Congenital FNC dehiscence is usually a microdehiscence, measuring less than 1 mm, detected in histopathological studies.<sup>4</sup> Acquired FNC dehiscence occurs owing to chronic middle ear inflammation, ear surgery, trauma, and neoplasm. Acquired FNC is often a macrodehiscence, measuring more than 1 mm, detected in imaging and surgery.<sup>4</sup> Histopathological studies of the temporal bone revealed higher incidence of multiple dehiscences of the FNC in newborns and young children.<sup>5</sup> Early diagnosis of the FNC dehiscence is critical for the differential diagnosis as well as medical and surgical management of the ear disease.

Facial nerve palsy (FNP) occurs infrequently in the pediatric population. Identifiable causes of FNP in children include infectious, congenital, neoplastic, autoimmune, and trauma. To date, the dehiscence of FNC as a cause of recurrent FNP in a child has not been reported. We describe clinical appearance and radiologic features of a child with recurrent FNP in the presence of dehiscence FNC.

## Case report

The chart of a 5-year-old boy with recurrent unilateral FNP was reviewed. The child was initially referred to the Otolaryngology clinic for evaluation of recurrent acute otitis media and hearing loss. He developed four episodes of bilateral acute otitis media within a year. His associated symptoms included otalgia, rhinorrhea, nasal congestion, fever, and left peripheral FNP. There was no history of otorrhea, dizziness, edema of the lips or cheeks, fissured tongue, weakness of extremities, headache, arthritis, migrating rash, diabetes, and hypertension. The last ear infection was 1 month prior to presentation. Treatment of acute otitis

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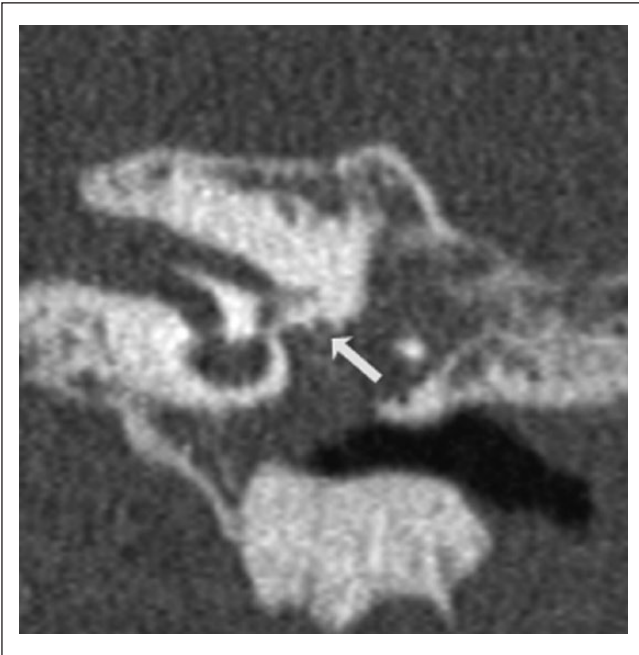
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**Figure 1.** Coronal reformatted CT image shows absence of normal bony covering of the tympanic segment of the left facial nerve (white arrow). There is complete opacification of the middle ear cavity.



**Figure 2.** Coronal reformatted CT image shows normal bony covering of the tympanic segment of the right facial nerve (white arrow).

media with *amoxicillin* also resolved left FNP. Parents reported that complete resolution of FNP occurred within 2–3 months after treatment. He had no family history of recurrent FNP. Physical examination revealed bilateral opaque tympanic membrane with no mobility. The degree of FNP was grade II based on the House–Brackmann grade of facial nerve function. High-resolution computed tomography of the temporal bones revealed incompletely covered tympanic segment of left facial nerve (Figures 1 and 2). Myringotomy and tube placement were recommended, and parents refused surgery.

## Discussion

The FNC dehiscence could theoretically place the nerve at risk for inflammatory or infectious insults as the nerve is exposed to contents of the middle ear. Acute otitis media is one of the most common infections of childhood occurring at least once in the majority of children by age 3 years. Despite the high frequency of acute otitis media in children, associated FNP is exceedingly rare. To date, an association between recurrent FNP and recurrent acute otitis media has not been reported.

The etiology of recurrent FNP includes several uncommon clinical entities such as Melkersson–Rosenthal syndrome, familial Mediterranean fever, Henoch–Schonlein vasculitis, and Heerfordt syndrome. Neoplasms involving the parotid gland, temporal bone, or cerebellopontine angle should be included in the differential diagnosis of recurrent

FNP. Our patient presented with recurrent FNP associated with each episode of acute otitis media. We postulate that exposure of the tympanic segment of the facial nerve to infection resulted in FNP when the child had recurrent acute otitis media.

Diagnosis of FNC dehiscence is made at surgery or using high-resolution computed tomography. Management of FNP in children begins with quick recognition and accurate diagnosis. Treatment is based on the underlying etiology. The clinician must always keep in mind that idiopathic FNP is a diagnosis of exclusion and occurs much less frequently in children. Therefore, a thorough investigation into potential causes must be performed. In addition to a comprehensive history and physical, children with atypical signs and symptoms should be evaluated by the appropriate specialist. Atypical symptoms include hearing loss, additional neurologic deficits, slow progression of paralysis, single facial nerve branch involvement, presence of head and neck masses, and recurrent symptoms. This study findings provide evidence that recurrent peripheral FNP may occur in children with recurrent acute otitis media in the presence of a dehiscent FNC. FNC dehiscence should be considered in the differential diagnosis of children with recurrent peripheral FNP.

## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Ethical approval

Ethical approval to report this case was obtained from University of Texas Southwestern Medical Center, Institutional Review Board (STU 022016-085).

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### Informed consent

Written informed consent was obtained from the patient's mother for anonymized patient information to be published in this article. University of Texas Southwestern Medical Center, Institutional Review Board (STU 022016-085) waived the requirement of informed consent for anonymized patient information to be published in this article.

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