

## Peripheral Facial Nerve Palsy after Adenotonsillectomy with Lidocaine Injection in the Peritonsillar Area : A Case Report

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### – ABSTRACT –

Local anesthetic injection at the surgical site in tonsillectomy is a commonly used method to reduce pain and bleeding postoperatively. Rare cases of transient facial nerve palsy due to local anesthesia have been reported, which are presumed to be a result of the local anesthetic infiltrating around the facial nerve trunk through the superior constrictor muscle. The authors experienced transient facial nerve palsy in a 6-year-old boy after tonsillectomy. In the recovery room, the patient could not wrinkle the right side of his forehead and completely close his eyes. The patient showed symptoms of peripheral facial nerve palsy that were equivalent to House-Brackmann grade (HB Gr) V. In this case, the patient showed improvement to HB Gr II after approximately 1 hour and complete recovery after 3 hours from the onset of symptoms. Here, we present the case and a review of the literature. (J Clinical Otolaryngol 2014;25:172-175)

**KEY WORDS** : Tonsillectomy · Lidocaine injection.

### Introduction

Tonsillectomy is one of the most common operations in otolaryngology. Common complications that might arise after the tonsillectomy include nausea, vomiting, and bleeding.<sup>1)</sup> Among these complications, pain caused by the operation may arouse secondary problem in children, such as limited intake of food, which then leads to a slow recovery.

Pain is controlled by administering analgesics ; however, there can be difficulty in controlling pain because children may refuse to take painkillers and there are limitations to inject painkillers. Thus, local injection at

the peritonsillar area with topical anesthetic substances is generally performed.<sup>2)</sup>

Complications have been reported for local injections at the peritonsillar area such as deep cervical abscess, circulatory failure, transient bilateral glossopharyngeal nerve paralysis, transient bilateral vocal cord paralysis,<sup>3)</sup> and in rare cases, transient facial paralysis.<sup>4)</sup> Most facial paralysis cases are temporary with recovery within 24 hours of the outbreak of the symptoms.

We report a case of temporary right-sided peripheral facial nerve palsy following adenotonsillectomy performed under general anesthesia with local injection of lidocaine and epinephrine.

### Case Report

A 6-year-old boy presented to the outpatient clinic with a 2-year history of snoring and mouth breathing. The patient planned to undergo an adenotonsillectomy for adenotonsillar hypertrophy. The patient had generally been in good health, with a history of inpa-

논문접수일 : 2013년 9월 12일

논문수정일 : 2013년 9월 26일

심사완료일 : 2014년 11월 19일

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tient treatment for bronchitis at age 2 and medical treatment for chicken pox 2 weeks prior to presentation. Preoperative physical examination performed upon admission revealed bilateral enlargement of the tonsils and a PNS series showed enlarged adenoids. No other abnormalities were observed in the oropharynx.

Under general anesthesia, the patient was placed in Rose's position with the head extended at approximately 30 degrees. The mouth was opened and the tongue was pressed using a McIvor mouth gag fixed in place along with the tube. After injection in the anterior and posterior palatal arches and right above the tonsils with a mixture of 1 : 200,000 Epinephrine and 1% Lidocaine, bilateral tonsillectomy was performed by the thermal welding method using a bovie with minor bleeding controlled with bipolar electrocauterization. The operation was completed without any complications ; the patient was extubated upon recovery of adequate self-ventilation and consciousness.

In the recovery room, symptoms of complete peripheral facial palsy of HB Grade V were observed while the patient cried, including lack of wrinkle formation in the right forehead, inability to completely close the right eyelid, and a definite decrease in lip movement, in comparison with the unaffected side (Fig. 1).

Movement of the facial muscles showed improvement upon examination in the ward an hour after the onset of symptoms. The palsy was then of HB Grade II,



**Fig. 1.** Facial nerve palsy (HB Grade V) observed in recovery room.

only distinguishable when carefully observed (Fig. 2). After an additional 2 hours, the facial nerve palsy was completely resolved (Fig. 3).

In order to document the degree of degeneration on five ramifications of the facial nerve, we examined Electroneurography (ENoG) one hour and three hours after the operation. The anterior part generally became larger at three hours after the operation than at one hour after ; however, degeneration of the right nerves where paralysis occurred in both of two examinations was not obviously observed at the second checkup (Table 1).

## Discussion

One of the most common complications after adenotonsillectomy is pain and bleeding. Post-operative



**Fig. 2.** Almost resolved facial nerve palsy (HB Grade II) at one hour after symptom onset.



**Fig. 3.** Completely resolved facial nerve palsy after 3 hours after symptom onset.

**Table 1.** Electroneurography (ENoG) results at 1 hour and 3 hours after onset of symptoms

		ENoG reports		
		Rt side	Lt side	Diff-Amp (%)*
After 1 hr	Temporal br	0.94	0.90	104.4
	Zygomatic br	1.59	1.66	95.8
	Buccal br	1.61	1.84	87.5
	Marginal mandibularbr	1.53	1.65	92.7
	Cervical br	Not measured	0.65	X
After 3 hrs	Temporal br	1.56	1.28	121.9
	Zygomatic br	2.05	1.73	118.5
	Buccal br	2.18	1.81	120.4
	Marginal mandibularbr	1.91	1.75	109.1
	Cervical br	0.58	0.98	59.2

\* : Diff-Amp (difference of amplitude, %) : (amplitude of affected side/amplitude of unaffected side) × 100 (%)

pain control is especially difficult in children, because they often refuse drug administration. Therefore local injection at the peritonsillar area with topical anesthesia has been utilized at some institutions to overcome this problem.<sup>2)</sup>

Lidocaine, an acetanilide derivative, is most frequently used in combination with epinephrine for its properties, including a short induction time‘about 20–30 minutes’,<sup>5)</sup> an absence of local irritative symptoms and allergic reactions, a longer and stronger action compared to other topical anesthetic substances such as procaine, bupivacaine, and a superficial anesthetic effect, which resembles that of cocaine, only weaker.<sup>6)</sup> Particularly, one report showed that its effect on pain control can last up to 10 hours when mixed with epinephrine so recently it has become a commonly used topical anesthetic substance in adenotonsillectomy to control pain and bleeding.<sup>7)</sup>

The facial nerve leaves the skull via the stylomastoid foramen and is located superficially to the mandibular ramus. It then enters the parotid gland where it divides into branches. A local anesthetic, if injected deep into the peritonsillar tissue, can infiltrate through the superior constrictor muscle to the region of the facial nerve trunk and its branches.<sup>4)</sup> Reports of cheek and upper neck subcutaneous emphysema after tonsillectomy have reflected a possible pathway from the tonsillar bed to the interstitial spaces of the upper neck and the cheek.<sup>8)</sup>

The ENoG test did not show obvious nerve degeneration on the right side that was paralyzed, but this result has important methodologic flaw. The ENoG test can check functions of the facial nerve branches distal to the facial nerve trunk near peritonsillar area. And Wallerian degeneration in the distal branches takes 72 hours, thus the ENoG test is recommended after at least 3 days from onset of facial palsy.<sup>9)</sup> In addition, the ENoG test was not useful prognostic indicator of facial palsy, especially Bell’s palsy and Ramsay-Hunt’s syndrome in a recent case.<sup>10,11)</sup> But, we performed the ENoG, because facial palsy happened after lidocaine injection different from Bell’s palsy. And we did not perform follow-up ENoG because facial palsy was completely resolved after 3 hours.

This report supports otolaryngologists must consider that peripheral facial nerve palsy can occur when injecting topical anesthetic during tonsillectomy, even without direct damage to the facial nerve. As such, they must be careful not to infiltrate the deep portion of the peritonsillar region with a local injection. In addition, peripheral facial nerve palsy associated with local anesthetics used during tonsillectomy without evidence of direct damage to the facial nerve should be managed carefully observing the patient’s condition and providing adequate reassurance to the patient.

## REFERENCE

- 1) Karaman M, Ilhan AE, Dereci G, Tek A. *Determination of optimum dosage of intraoperative single dose dexamethasone in pediatric tonsillectomy and adenotonsillectomy. Int J Pediatr Otorhinolaryngol* 2009;73(11):1513-5.
- 2) Cook SP. *Bupivacaine injection to control tonsillectomy pain. Arch Otolaryngol Head Neck Surg* 2001;127(10):1279.
- 3) Fradis M, Goldsher M, David JB, Podoshin L. *Life threatening deep cervical abscess after infiltration of the tonsillar bed for tonsillectomy. Ear Nose Throat J* 1998;77(5):418-21.
- 4) Shlizerman L, Ashkenazi D. *Peripheral facial nerve paralysis after peritonsillar infiltration of bupivacaine: a case report. Am J Otolaryngol* 2005;26(6):406-7.
- 5) Waite A, Gilliver SC, Masterson GR, Hardman MJ, Ashcroft GS. *Clinically relevant doses of lidocaine and bupivacaine do not impair cutaneous wound healing in mice. Br J Anaesth* 2010;104(6):768-73.
- 6) Harmatz A. *Local anesthetics: uses and toxicities. Surg Clin North Am* 2009;89(3):587-98.
- 7) Thomson CJ, Lalonde DH. *Randomized double-blind comparison of duration of anesthesia among three commonly used agents in digital nerve block. Plast Reconstr Surg* 2006;118(2):429-32.
- 8) Watanabe K, Kunitomo M, Yamauchi Y, Kimura M, Masuno S, Aoki H, et al. *Subcutaneous emphysema after tonsillectomy: a case report. J Nippon Med Sch* 2004;71(2):111-3.
- 9) Chow LC, Tam RC, Li MF. *Use of electroneurography as a prognostic indicator of Bell's palsy in Chinese patients. Otol Neurotol* 2002;23(4):598-601.
- 10) Lee DH, Chae SY, Park YS, Yeo SW. *Prognostic value of electroneurography in Bell's palsy and Ramsay-Hunt's syndrome. Korean J Otolaryngol* 2005;48(10):1205-10.
- 11) Yoon SP, Baek SH, Lim EJ, Park JH. *A case of iatrogenic cervicofacial subcutaneous emphysema after tonsillectomy. J Clinical Otolaryngol* 2011;22(2):259-63.