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# CLINICAL OBSERVATIONS ON 750 CASES OF LARYNGEAL PALSY*

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During the period from January 1961 to December 1980, 750 cases of laryngeal palsy were seen at the Voice and Speech Clinic, Department of Otolaryngology, the Tokyo University Hospital. Figure 1 illustrates the number of cases for each year. There were an exceptionally large number of cases in 1970. This will be discussed in detail below.

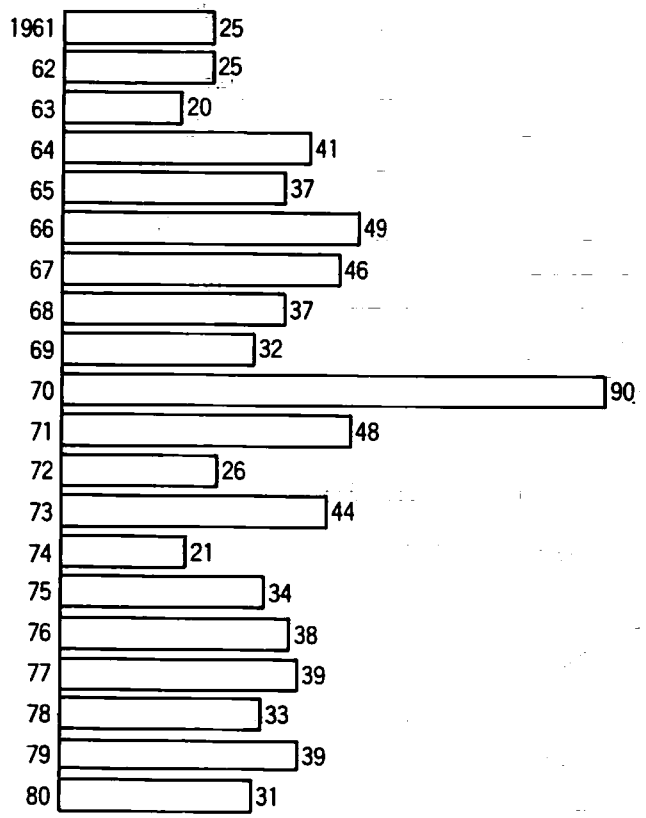


Fig. 1 Yearly incidence of laryngeal palsy from 1961 to 1980.

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Figure 2 shows the age and sex distributions of the cases. The age distribution was quite even from the third to sixth decades of life. There was no significant sex difference in the present series.

In most cases, laryngeal palsy was found unilaterally and the incidence of palsy on the left side was more than twice as high as that of the right side. Bilateral palsy was seen in 87 cases (Fig. 3).

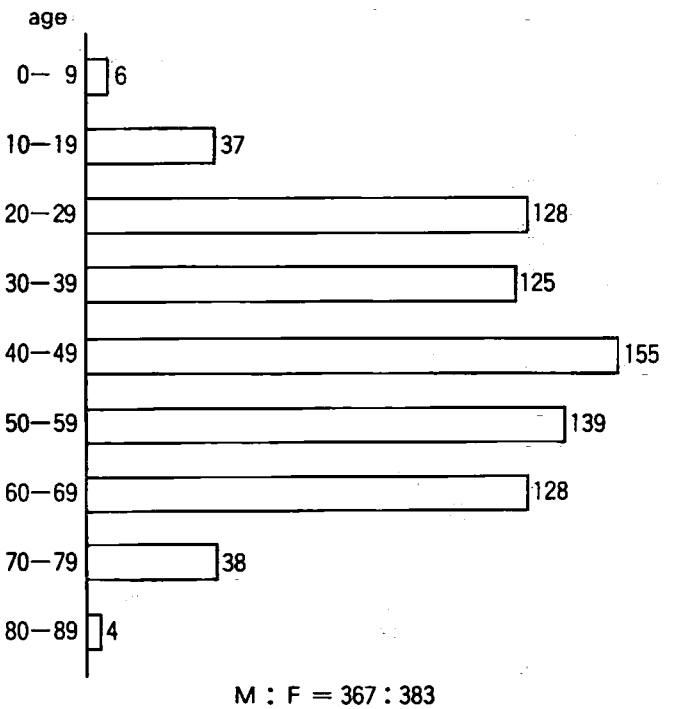


Fig. 2 Age and sex distributions

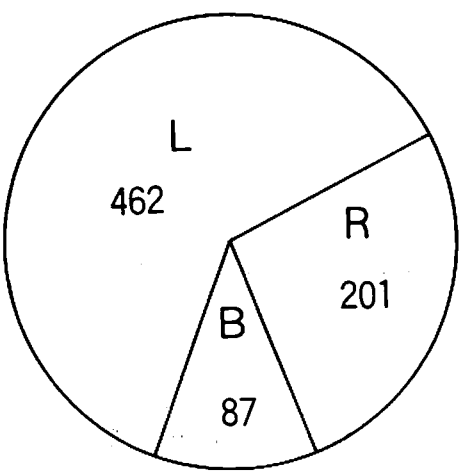


Fig. 3 Laterality of laryngeal palsy

The causes of palsy were quite diverse in this series. They are divided into two categories, surgical and non-surgical, for convenience's sake (Hirose, 1978). Detailed classifications are given in Table I.

In surgical or postoperative laryngeal palsy, thyroid surgery is the most common cause of nerve injury. Recent developments in chest surgery have concomitantly led to an increasing number of intrathoratic or mediastinal injuries to the recurrent laryngeal nerve. Among those, surgery for PDA is the most common cause. Intubation for general anesthesia is another possible cause of postoperative laryngeal palsy, although the mechanism of nerve injury has not been completely clarified as yet (Hahn etal., 1970; Ellis and Pallister, 1975; Kobayashi et al., 1980).

In the present series, we experienced 28 cases of postintubation laryngeal palsy. In 21 out the 28, laryngeal palsy was found on the left side. The incidence of postintubation palsy relative to the total number of intubation anesthesia was about 1 to 1,000 or 1,500 cases of intubation in our hospital. Seventy-five percent of the 28 cases developed laryngeal palsy following GI-tract surgery. GI-tract surgery accounts for approximately 20% of all surgical cases in our hospital, and the incidence of laryngeal palsy following GI-tract surgery seems to be relatively high. The reason for this is not clear (Table II).

The type of endotracheal tube or cuff or the method of its sterilization did not appear to have any specific relationship to the development of postintubation palsy. In most cases, the duration of endotracheal intubation for surgery was over 3 hours. According to our statistics, more than 80% of the surgical cases in our hospital required intubation for less than 2 hours. The duration certainly appears to be a factor in the development of postintubation palsy.

We routinely perform EMG examinations on these cases. In the present series, all cases except one showed volitional EMG activity of some degree during phonatory effort, and in these 27 cases, complete recovery of vocal fold movement was obtained within 1 to 4 months. These results suggest that the postintubation palsy is most likely due to neurapraxia of ischemic origin, possibly secondary to the mechanical compression of the blood vessels supplying the recurrent nerve at the level of a cuff of the tube, although

| Surgical (postoperative) | | | | Non-surgical | | |
|---|---|---|---|---|---|---|
| Neck surgery | | | 193(4) | Disorders in Neck | | 36(1) |
| thyroid surgery | | 160 | | trauma | 15(1) | |
| others | | 33(4) | | thyroid cancer | 19 | |
| neurinoma | 9(1) | | | periesophagitis | 2 | |
| fibroma | 1 | | | Chest diseases | | 83 |
| carotid body tumor | 3(1) | | | mitral valve dis. | 13 | |
| cervical cyst | 2 | | | aneurysm | 13 | |
| nerve block | 1 | | | lung cancer | 27 | |
| lymphadenitis | 5 | | | esophag. cancer | 6 | |
| miscellaneous | 12(2) | | | mediastinal tumor | 9 | |
| Chest surgery | | | 83 | pleural adhesion | 15 | |
| heart and large vessels | | 51 | | Idiopathis (viral?) | | 307(37) |
| PDA | 28 | | | Associated palsy with definitive causes | | 19(19) |
| coarctation | 2 | | | | | 445(57) |
| ASD | 3 | | | | | |
| mitral stenosis | 8 | | | | | |
| Fallot | 3 | | | | | |
| aneurysm | 7 | | | | | |
| others | | 32 | | | | |
| lung cancer | 9 | | | | | |
| mediastinal tumor | 8 | | | | | |
| esophageal cancer | 14 | | | | | |
| pyothorax | 1 | | | | | |
| Postintubation | | | 28 | | | |
| Others (local anesthesia) | | | 1 | | | |
| | | | 305(4) | | | |

Total = 750(61)

( ) = associated palsy

Table I. Classification of the causes of laryngeal palsy in the present series.

Table II Postintubation palsy

L:R = 21:7

| Types of surgery | |
|---|---|
| GI-tract | 21 |
| OBGYN-Uro | 4 |
| Neuro | 1 |
| Orthopedic | 1 |
| Ophthalmolog | 1 |
| | 28 |

other possibilities must also be taken into consideration.

In non-surgical cases, we always find it necessary to search for possible malignancy along the entire course of the vagal and recurrent laryngeal nerves, since we have had a considerable number of cases in which definitive malignancy was found in the thyroid, esophagus and lung, etc. (cf. Table I).

One of the unsolved porblems in the non-surgical group is the so-called idiopathic palsy, which is most common in this series. Similar to Bell's palsy of the facial nerve, the true mechanism of idiopathic palsy is not fully explained as yet, but viral infection is quite probable. In particular, some authors strongly suggest the possibility of influenza virus infection in this category (Hefter and Bildstein, 1970; Wirth and Leypoldt, 1970; Ishii et al., 1971; Sato et al., 1981).

Figure 4 compares the yearly incidence of laryngeal palsy of the present series and the rate (number of the cases per 100,000 population) of influenza in Japan in each year, represented by line A in the upper part of the figure. Line B in the lower diagram represents %-incidence of idiopathic palsy for each year, i.e. the ratio of idiopathic palsy to the total numbers of the cases in each year which is also represented by line C.

It appears that there is some correlation between the %-incidence and the influenza rate, but the value of correlation does not appear to be very high. In particular, the incidence is extremely high in 1970, while the influenza case rate in that particular year is not too high.

As shown in Figure 5, however, if we analyze closely the age

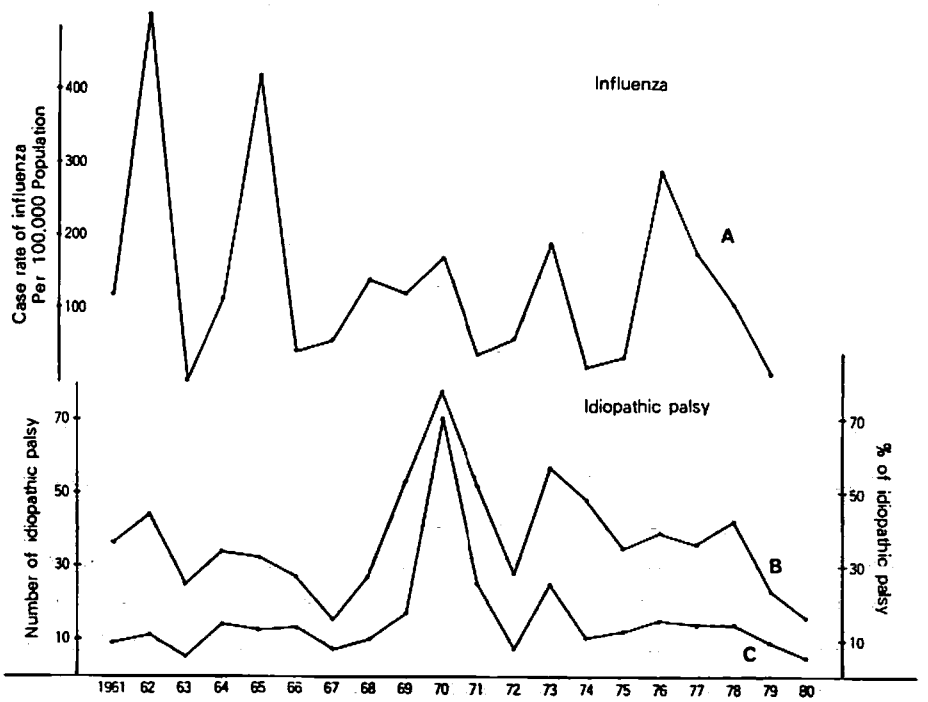


Fig. 4 Comparison between the yearly incidence of laryngeal palsy and the case rate of Influenza in Japan for influenza in Japan for each year.

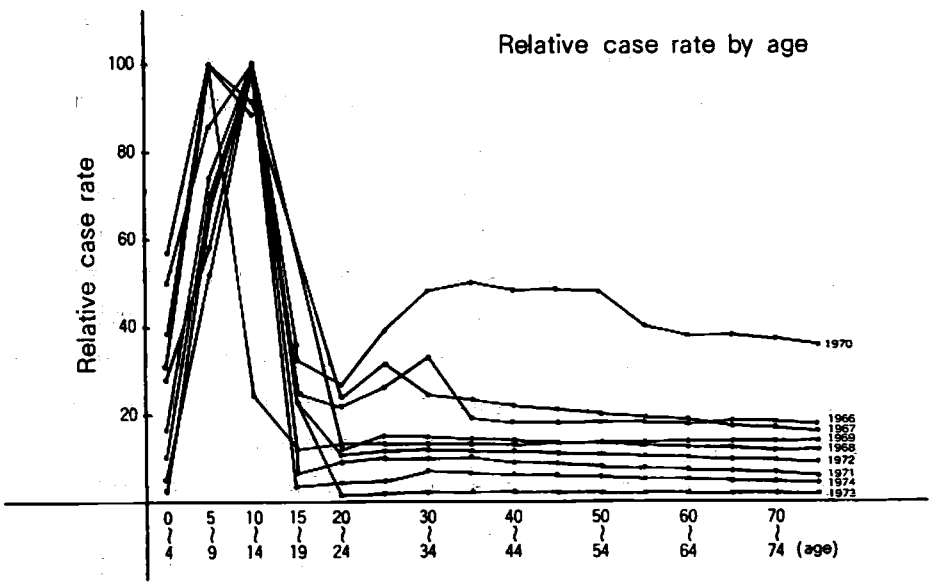


Fig. 5 Relative case rates of influenza for differenbt age ranges.

distribution of the influenza rate in each year, it can be seen that there was a peculiar type of influenza epidemic in 1970. That is, the relative case rate in the adult population is relatively high only in 1970, whereas in the other years, the age distribution is markedly skewed toward the younger age. In our series, and in other reported series as well, there were very few cases under the age of 20 in the idiopathic group that erupted in 1970. Taking these two facts together, we may assume that there was a specific type of epidemic in 1970, the incidence of which was relatively high in the adult age group, and this specific type of viral infection could well be responsible for the eruption of epidemic laryngeal palsy. This is merely a speculation and further analysis is needed before drawing any definite conclusion.

We are not claiming, however, that influenza is the only candidate as a causative virus of laryngeal palsy. A serological study on 30 recent cases showed that the reaction to varicella zoster virus was positive in approximately 50% of the cases (Fig. 6). The result would indicate that varicella zoster infection can also be causative in some cases.

As for a surgical approach to the paralyzed vocal fold, we have recently been performing thyroplastic operations according to Isshiki's method in which a piece of silicone block is used to shift the vocal fold medially through the cartilagenous window, particularly in those cases having a wide glottal chink (Isshiki, 1980). Liquid silicone injection to the paralyzed vocal fold is also used in selected cases. In approximately 50% of the cases, voice therapy was successful. In the other 50%, phonosurgery was usually recommended even to the patient having fare voice at least

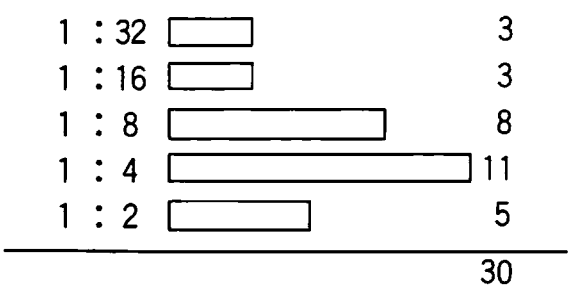


Fig. 6 Results of serological test for varicella zoster virus in recent 30 cases.

at conversational level, for further improvement in phonatory function. Also, it is our opinion that this type of surgery should be performed even on those cases having laryngeal palsy secondary to malignancy of poor prognosis, because effective vocal communication is always supportive for such patients and assessment of effective glottal closure is also necessary for preventing possible aspiration.

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