endocrine examinations such as urinary steroids, BMR, Thorn's test, serum cholesterol, serum protein analysis and serum electrolytes.

5) Psychological test and life history were inquired carefully and precisely. Only 3 cases showed normal profile in MMPI, 12 cases were the 1, 3, type which displays a hypochondrical-hysterical state.

From the Kraepelin test only 3 cases showed a normal curve, while the others showed a lack of initial endeavour or recess effect. Interview of their life history is essential in arriving to the conclusion. Past history of psychosomatic disease (18 cases), death of their parent in childhood (17), changing of job (18), changing of doctors for the injury (21), compensation not settled (21) are the most common causes. Almost all of these patients were the injured (18), and they either hate or are angry with the assaulter.

From these investigation we can indicate that there is an intimate relation with adaptation disorders in each cases. It is important to deal with these intractable cases from the standpoint of holistic aspect.

182. Studies on So-called Whiplash Injury

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199 cases, suffered from extension acceleration injury in the neck by rear end collision, were treated and followed up. The cases who had the complication of the injury in the spine, the spinal cord, and the brain were removed from this report.

Electromyography was achieved on 33 cases with at random selection. On 29 cases, abnormal waves such as high amplitude voltage, complex neuro-muscular unit voltage, grouping voltage and so on were noticed. The relationship among electromyogram, and their symptoms was not definite. Re-investigation on 8 cases was shown that abnormal electromyogram gradually appeared in the upper part of the cervical cord day by day. This inclination was not parallel with other symptoms.

Electroencephalography was achieved on 34 cases with at random selection. 4 cases were abnormal and 5 cases borderline. But, on the cases of normal electroencephalogram, the appearance of alpha-waves was apt to extend diffusely. The relationship between electroencephalogram and symptoms was not proven directly, but the data of electroencephalogram was useful for the administration of drug

(anticonvulsant was sometimes effective on the complaints on the neck and shoulder). That is, it might be speculated that some symptoms are embellished with the brain-disorders.

Obstinate cases in the chronic stage were able to classify to two groups; that is, one group (7 cases) had chiefly the complaints of headache, migraine and neck occipital symptoms, and another group (6 cases) had pain in the neck and shoulder girdle. They said that first group was derived from the disorders in the vertebral artery, vertebral nerves, and cervical sympathetic nerves. But, on our experiences, patient's complaints re-occurred on the discography at the upper cervical spine (C2-3, C3-4). As a brace without loading and anterior spinal fusion were effective, the intervertebral disc lesions in the upper cervical spine were thought for primary cause of this disease. On second group, traction, brace without loading, scalenotomy, and anterior spinal fusion were effective.

Based on these findings, the following conclusions were drawn that an obstinate case of whiplash injury must be treated as an intervertebral disc lesion at the cervical spine.

183. About So-Called "Whiplash Injury" in Neurosurgical Field

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We have experienced 2967 cases of trauma to the head and/or the neck due to traffic accident during past 2 years and 5 months in the Sapporo Medical College Hospital.

This report reveals the analytic data about the cases of so-called whiplash injury only.

As to sex distribution, male was 69.6%, female 30.4%. 58.2% of cases was caused by rear-end collision. The disturbance of consciousness was observed in 53.7% of cases, 66% of cases began to complain of more or less certain symptoms within 3 days. In the X-ray examination, 13.9% of cases reveals slight compressed fracture, 19.5% of cases cervical instability, 10.2% of cases narrowing of intervertebral space and 54.1% no changes.

In 2 cases with typical great occipito-trigeminal syndrome in which Cloward procedure was carried out for the lower cervical part, the headache in the occiput was markedly improved. From these results we are impressed that there might be some unknown mechanism which results in great occipito-trigeminal syndrome not only in the upper cervical part, but even in the lower cervical part.

As to the prognosis, in 26.4% of cases the sign and symptom were subsided