Matsumoto Dental University
Graduate School of Oral Medicine
1780 Gobara, Hirooka, Shiojiri,
Nagano 399-0781, Japan

第 111 回松本歯科大学大学院セミナー

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場　所：実習館 2 階総合歯科医学研究所セミナールーム

演　者：B.J. Sessle　氏　（カナダ　トロント大学歯学部･教授）

タイトル：CORTICAL PLASTICITY AND ITS ROLE IN LEARNING OF OROFACIAL MOTOR SKILLS AND IN ADAPTATION TO AN ALTERED DENTITION.（口腔顔面の運動技能の学習や歯の変化への適応に対する大脳皮質の可塑性の役割）

Although the primary motor cortex (MI) is considered important in the initiation, control and learning of motor behaviours, there is little information on the role of the *face* MI in trained or semi-automatic orofacial motor behaviours or in behavioural adaptations to an altered oral environment. To address these issues, we have carried out a series of studies that have utilised intracortical microstimulation (ICMS) or reversible cold block of the face MI or single neurone recordings in face MI of monkeys and rats as well as transcranial magnetic stimulation (TMS) in humans. Our studies in monkeys have revealed that face MI plays a strategic role in elemental and learned motor behaviours and in certain aspects of chewing and swallowing. We have also recently found that successful training of awake monkeys in a novel tongue-protrusion task is associated with significant neuroplastic changes in face MI, e.g. a 20% increase in the proportion of discrete MI efferent zones for tongue protrusion (as revealed by ICMS) as well as marked increases in the proportions of MI neurones showing tongue protrusion-related activity and of MI neurones with a tongue mechanoreceptive field. These novel findings of sensorimotor cortical plasticity in monkeys are supported by correlated TMS findings in humans which have revealed significantly enhanced corticomotoneuronal excitability when humans learn the novel tongue-protrusion task. Our current ICMS studies in rats suggest that cortical neuroplasticity also is important in adaptation to an altered oral environment. Trimming or extraction of the rat's lower incisors or damage to the rat's lingual nerve can result after 1 or more days in significant changes in the cortical motor representations of the tongue or jaw muscles.

These findings suggest that the face MI is important in orofacial motor skill acquisition and adaptation to an altered occlusion or loss of teeth or lingual sensory function, and that it reflects dynamic and modifiable constructs that are modelled by behaviourally significant experiences and that are critical to learning and adaptive processes.

大脳皮質一次運動野 (MI) には体部位局在が存在し、そのうち顎顔面領域の運動に関連している領域を顔面運動野 (*face* MI) と呼ぶ。本セミナーでは、演者らの最近の実験データをもとに、神経生理学的な手法により同定された顔面運動野の広がりや神経活動が、舌運動技能の学習または歯の状態の変化に対応して、可塑的な変化をおこすことを示され、このような大脳皮質の可塑的な変化が顎口腔の運動機能に重要な役割を持つことを解説される。

顎口腔機能制御学講座　増 田 裕 次