

矯正用橫腭弧線對成人舌頭的吞嚥模式之影響

The influences of orthodontic transpalatal arch on the swallowing pattern of the tongue in adult subjects

中文摘要

齒列矯正治療時經常使用橫腭弧線 (Transpalatal arch)，而患者於裝置後通常都會有不太舒服的感覺。因此，爲了瞭解舌頭的吞嚥功能在裝置橫腭弧線後的功能適應性變化，本研究是在同一位受測者放置兩次不同高度 (2mm 和 4mm) 之橫腭弧線，每次放置 7 天。選取 15 名健康的成年志願者爲受測對象，使用防震掃描技術之 B 模式結合 M 模式口腔超音波做舌頭之吞嚥運動的紀錄與客觀測量數據，和使用視覺類比尺度做受測者的主觀自我評分紀錄 (吞嚥困難度、牙齒疼痛度和舌頭疼痛度)。了解舌頭吞嚥運動之客觀的超音波測量數據變化和受測者的主觀自我評分紀錄之間的關係，並以無母數分析法之 Spearman's correlation analysis 求得其間的相關性；觀察吞嚥模式受影響的程度，並以無母數分析法之 Wilcoxon sign ranked test 求得其間的差異。結果顯示客觀的超音波吞嚥運動測量數值和受測者的主觀自我評分紀錄之間是有相關性存在的，尤其以休息位置與早期終止期運動幅度之正相關、吞嚥困難度與晚期終止期和全部吞嚥運動時間之正相關、舌頭疼痛度與牙齒疼痛度之正相關爲有意義。裝置橫腭弧線會使舌頭的休息位置向下移動、使吞嚥運動之晚期運送期時間延長並於第七天回復、使吞嚥運動之早期終止期幅度增加、使吞嚥運動之晚期終止期時間延長且高度越大之橫腭弧線所造成之時間延長量越長、和使全部吞嚥時間延長。拆除橫腭弧線後，吞嚥運動之超音波測量數值會立即回復，但是舌頭的休息位置則會在拆除 2mm 橫腭弧線後之第 7 天會回復；以及拆除 4mm 橫腭弧線後之第 1 天會回復。因此由本實驗可知，吞嚥運動會受橫腭弧線影響，且於 7 天內會有初期的適應。於橫腭弧線拆除後，吞嚥運動會立即回復。

英文摘要

The application of transpalatal arch (TPA) is quite common in orthodontic treatment. However, patients often feel discomfort after application of TPA. Therefore, the purpose of this study was to investigate the influence of TPA on tongue movement during swallowing as well as the adaptation ability of tongue on TPA. 15 healthy adults without any known swallowing disorder were selected in this study. There are two different TPAs (2mm and 4mm) to wear and the wearing time is 7 days for each one. The volunteers were examined by the B+M mode ultrasonography for the subjective tongue movement during swallowing and by the visual analogue scales (VAS) for the objective self-evaluation (dysphagia, toothache, pain of tongue). The relationships between the objective VAS value and the subjective ultrasonographic

measurement of swallowing movement were examined by Spearman's correlation analysis. The differences between the original condition and ongoing conditions after TPA application were examined by Wilcoxon sign ranked test. There are correlations between the objective VAS value and the subjective ultrasonographic measurement of swallowing movement. The changes of rest position are positively correlated to the changes of magnitude of early final phase. The degrees of dysphagia are positively correlated to the changes of duration of late final phase and total swallowing. The degrees of pain of tongue are positively correlated to the degrees of toothache. The application of TPA resulted in an downward movement of the rest position, a prolonged duration in late transport phase ($p < 0.05$) and recovered in 7th day, an increased magnitude of early final phase, a prolonged duration of late final phase and the longer prolongation induced by the higher TPA, a prolonged duration of total swallowing. Besides the rest position of tongue, all swallowing ultrasonographic measurements were recovered immediately after removal of TPA. The rest position was recovered in 7 days after removal of 2mm TPA and recovered in 1 day after removal of 4mm TPA. Indeed, the swallowing movement of tongue was interfered after application of TPA, but the tongue owned the ability of adaptation to TPA in 7 days. The swallowing movement will recover immediately after removal of TPA.