ダイビングによる顎関節症の予防と安全対策
ーテーラーメイドマウスピースの開発とその実用化ー

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Prevention and Safety Measure for Diving-Related Temporomandibular Disorders; Development of Custom-made Diving Mouthpiece and its Practical Application

by

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ABSTRACT

The authors newly developed custom-made regulator mouthpiece for a scuba diver using thermoforming technique to relieve and/or prevent diving-related temporomandibular disorders. And we have already confirmed that in vitro study the adhesion behavior of laminated thermoforming materials maintained for 4 weeks (672 hours) even under the 0.2-MPa pressured water environment corresponding to about 20 meters of the sea. The purpose of the present study was to assess the effectiveness of custom-made diving mouthpiece in actual undersea environment. Six collegiate divers (1 male and 5 female, mean age; 22.8 yrs), who had diving-related temporomandibular disorders or often felt jaw-muscles soreness and fatigue during scuba diving, participated in clinical trials. Changes in pain of temporomandibular joints, jaw-muscles fatigue and occlusal stability in association with the usage of new

custom-made diving mouthpiece were measured on 11-point (0-10) numerical rating scale. As compared with old commercial diving mouthpiece, the custom-made diving mouthpiece significantly improved wearability, pain of temporomandibular joints, jaw-muscles fatigue and occlusal stability by 5.0, 5.7, 6.1 and 4.7 point, respectively ($p<0.05$). No significant changes were found in breathing difficulty, nausea and bad taste and smell. These results strongly suggested that custom-made diving mouthpiece may contribute to relieve and/or prevent diving-related temporomandibular disorders

要　旨

本分野では，われわれはダイビングによる歯科領域の潜水障害（顎関節症）を予防することを目的に，正しい下顎位を保持し，顎関節の変位を起こさず，顎筋や顎関節に無理な負担をかけない，ダイビング用テーラーメイドマウスピースの開発を手がけ，すでに加圧水中環境下での物性および耐久試験を実施し，十分な基本性能を有していることを確認した．そこで，今回，顎関節症を有するダイビング部所属の大学生6名（平均22.8歳）を対象に，実用環境下での臨床試験を行い，10段階評価法による分析を加えて，このテーラーメイドマウスピースの有用性を検討した．その結果，テーラーメイドマウスピース使用時の顎関節疼痛および顎筋疲労感は，既製マウスピース使用時に比べて，有意に減少した．またフィット感と咬合安定感も有意に良好であった．以上より，テーラーメイドマウスピースにはダイビングに関連した顎関節症を軽減・予防する効果があることが示唆された．