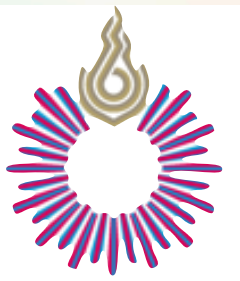


Water-blockage ability of swimming mouthguard



Background

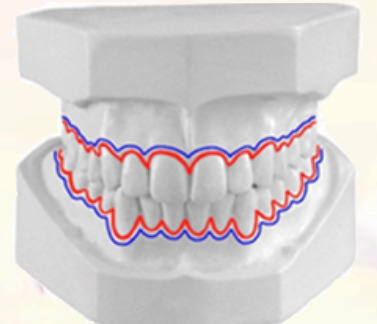
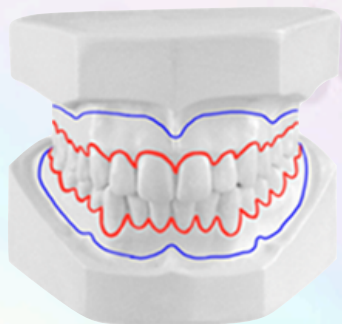
Previous surveys have reported dental erosion in over 90% of Thai competitive swimmers, and over 50 % of Thai's public swimming pools contained water with pH lower than 5.5. Still, no mouthguard specifically design to block out water has been established.

Objective

To evaluate the water-blockage ability among four different designs of mouthguard.

Methodology

Twenty-five participants were included in this study, contributing to a total of 44 dental arches (n=44) for each mouthguard design. Mouthguard design I (short-margin without cast preparation), design II (short-margin with cast preparation), design III (long-margin without cast preparation), and design IV (long-margin with cast preparation) were worn while orally swishing with 20 ml of colored solution for 10 times. The percentages of leakage-free teeth per arch were recorded and analyzed with Friedman's and Wilcoxon signed rank test using SPSS 20.0.



Long-margin without preparation

Long-margin with preparation

Short-margin without preparation

Short-margin with preparation

Result

The percentage of leakage-free teeth (per arch)							
Designs	N	Mean±S.D.	Percentiles			P-value	
			25th	50th	75th	Wilcoxon signed ranks	Friedman
Mouthguard I: Short margin, without cast preparation	44	85.10±17.26	75.00	89.76	100.00	MG II: 0.490	0.000*
						MG III: 0.026*	
						MG IV: 0.000*	
Mouthguard II: Short margin, with cast preparation	44	87.72±14.67	80.31	92.26	100.00	MG I: 0.490	0.000*
						MG III: 0.143	
						MG IV: 0.001*	
Mouthguard III: Long margin, without cast preparation	44	91.42±14.39	85.71	100.00	100.00	MG I: 0.026*	0.000*
						MG II: 0.143	
						MG IV: 0.066	
Mouthguard IV: Long margin, with cast preparation	44	94.07±14.10	92.86	100.00	100.00	MG I: 0.000*	0.000*
						MG II: 0.001*	
						MG III: 0.066	
Short-margin VS Long-margin mouthguard						0.000*	
Without cast preparation VS With cast preparation mouthguard						0.074	

Significant difference in water-blockage ability was found among the four designs (P=0.000). The most effective design in preventing leakage was the design IV (long-margin with cast preparation), followed by design III (long-margin without cast preparation), design II (short-margin with cast preparation), and design I (short-margin without cast preparation), respectively. The long-margin design provides better water-blockage ability (P=0.000) while the cast preparation along gingival margin does not significantly improve water-blockage ability (P=0.074).

Conclusion

The long-margin mouthguards with cast preparation demonstrated the highest water-blockage ability.

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