

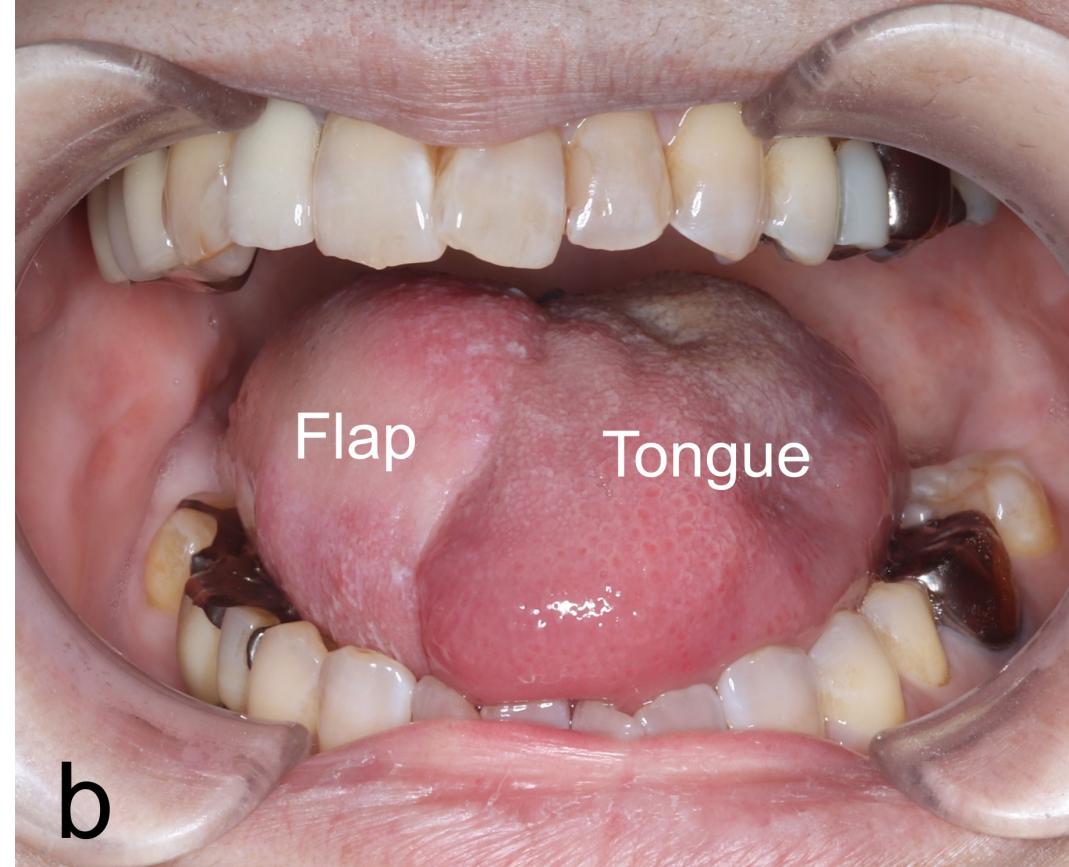
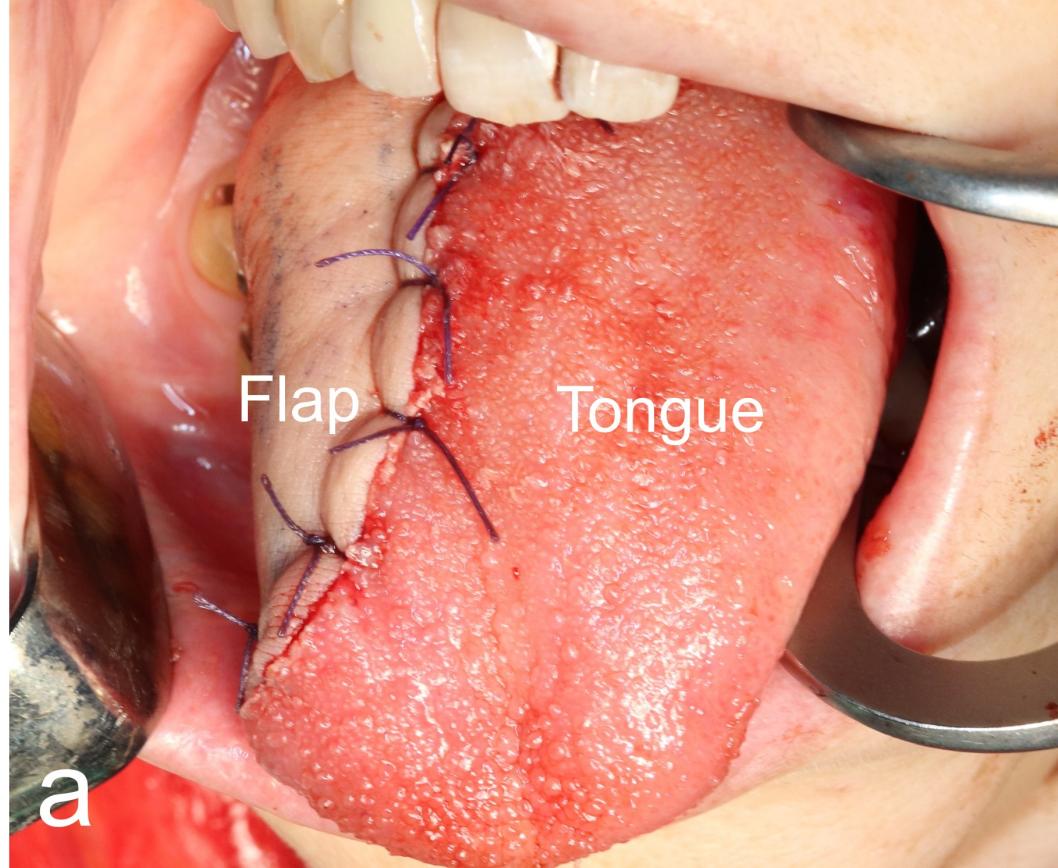


Title	Influence of tongue perception alterations on oral and maxillofacial functions of patients with malignant/premalignant tongue tumors
Author(s)	Suzuki, Mao; Matsunaga, Kazuhide; Koyama, Shihoko et al.
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Note	

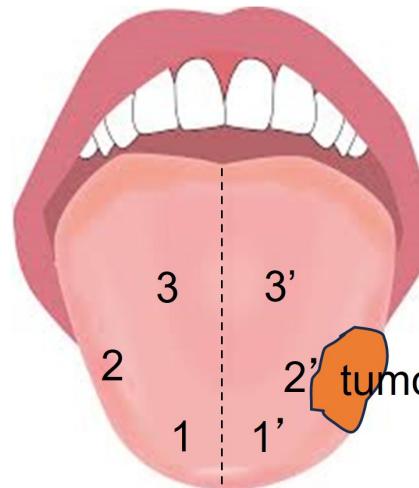
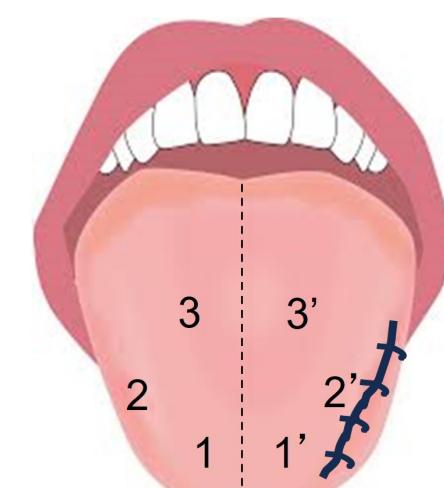
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**FIGURE 1** Intraoperative and postoperative photographs of a case in the flap group.

	Preoperative	Postoperative	
Classification	 <p>nontumor side      tumor side</p>		
Surgical procedures		Partial resection and primary closure	Less than hemi-glossectomy and radial forearm flap
Group	Leukoplakia, T1, T2 and T3 group	The closure group	The flap group
Evaluation period	Before surgery	After surgery (1, 3, 6 and 12 months)	

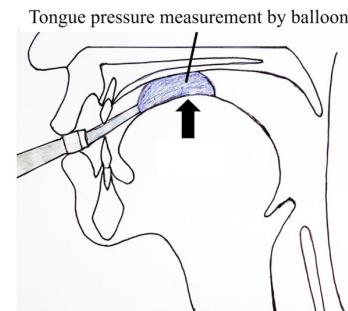
**FIGURE 2** The evaluation sites of tongue perception in patients

### Tongue movement (Total score 7 points)

(Matsunaga et al. 2002)

Forward movement	score	Upward movement	score
• Tongue apex exceeds the lower lip	3	• Tongue apex reaches the palate	2
• Tongue apex is within the lower lip	2	• Tongue apex does not reach the palate	1
• Tongue apex exceeds dentition but does not reach lower lip	1	• Tongue apex does not move	0
• Tongue apex is within dentition	0		
Lateral movement		score	
• Tongue apex reaches the commissure on the both sides		each 1	
• Tongue apex does not reach the commissure on the both sides		each 0	

### Tongue pressure (kPa) (Aoki et al.2014)



Tongue pressure at the center of the tongue during tongue dorsal elevation

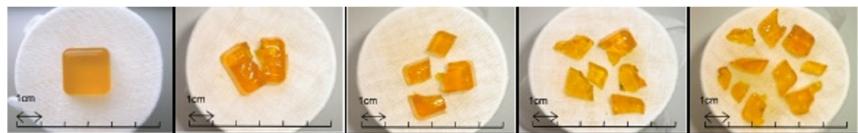
### The modified water swallowing test

(Oguchi, et al,2021)

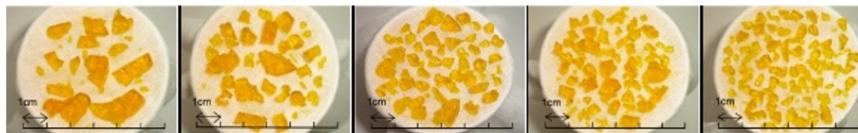
3 ml of cold water was poured using a syringe into the patient's oral floor, and swallowing dynamics was evaluated during two repetitive swallows

score	Evaluation criteria
1	No swallow, cough, and/or respiratory urgency
2	Swallow, respiratory urgency(suspicion of silent aspiration)
3	Swallow, stable breathing, cough and/or wet hoarseness
4	Swallow, stable breathing, no cough
5	In addition to 4, repeated swallowing is possible twice within 30 seconds

### Chewing strength (Score: 0-9 points) (Nokubi, et al,2013)



0 1 2 3 4



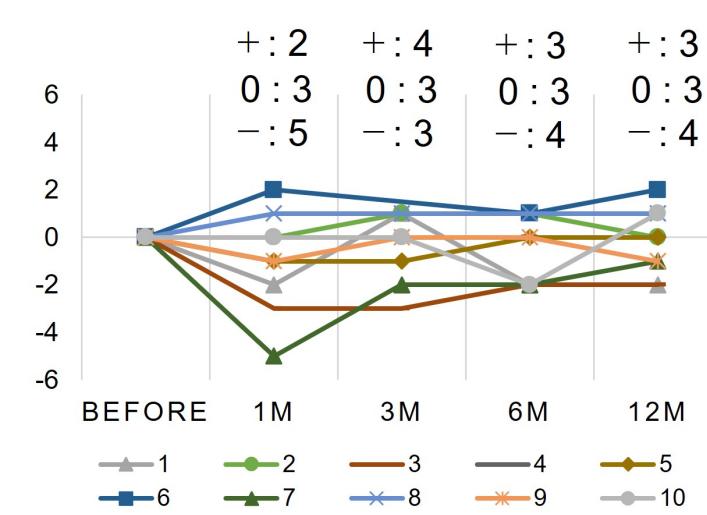
5 6 7 8 9

### Bite strength (N) (Shiga, et al,2020)

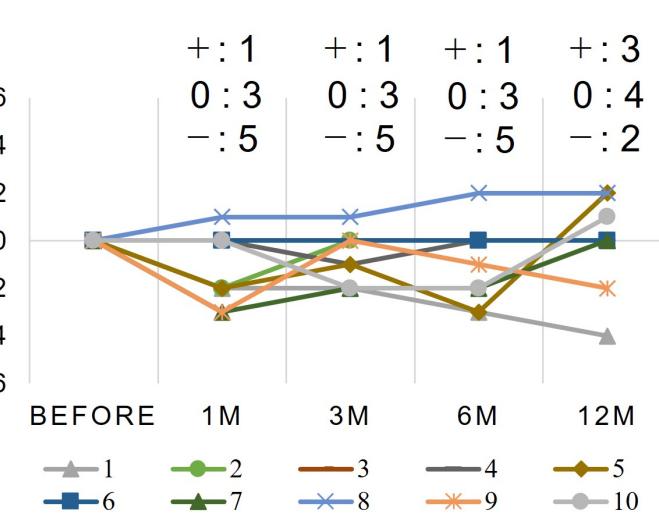


DENTAL PRESCALE II

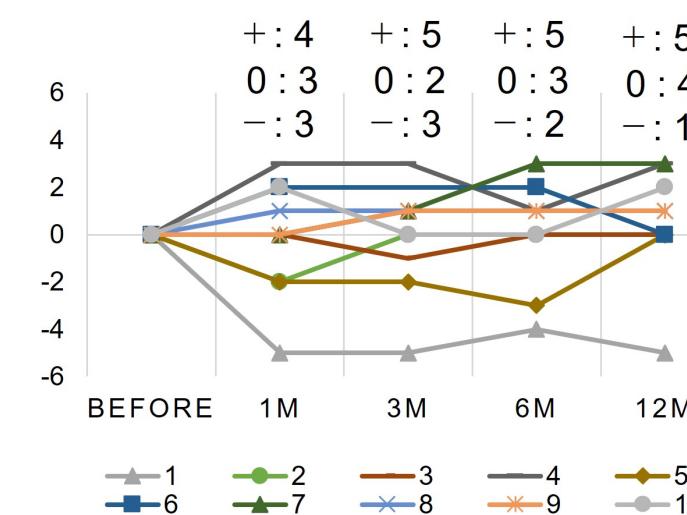
**FIGURE 3** the assessment of oral and maxillofacial functions



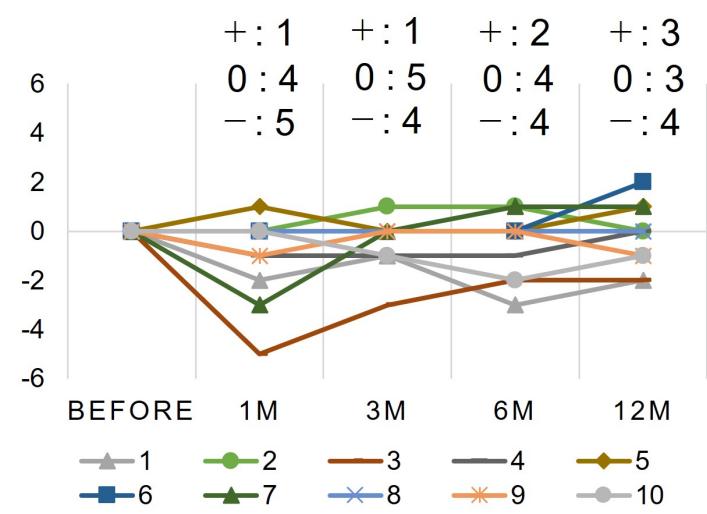
1: tongue apex on the nontumor side



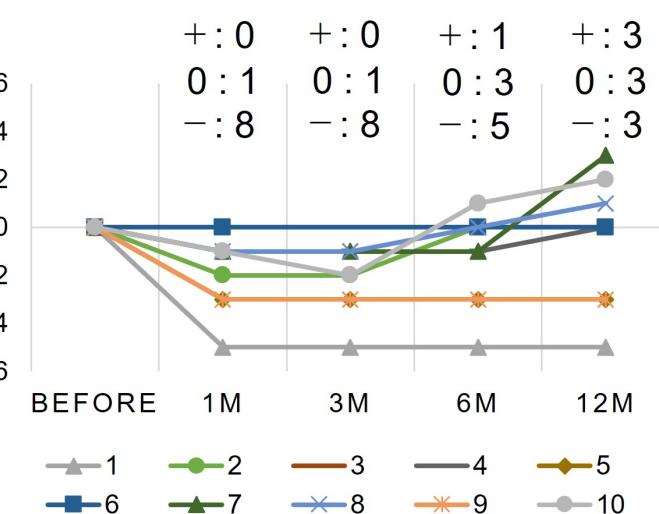
2: tongue margin on the nontumor side



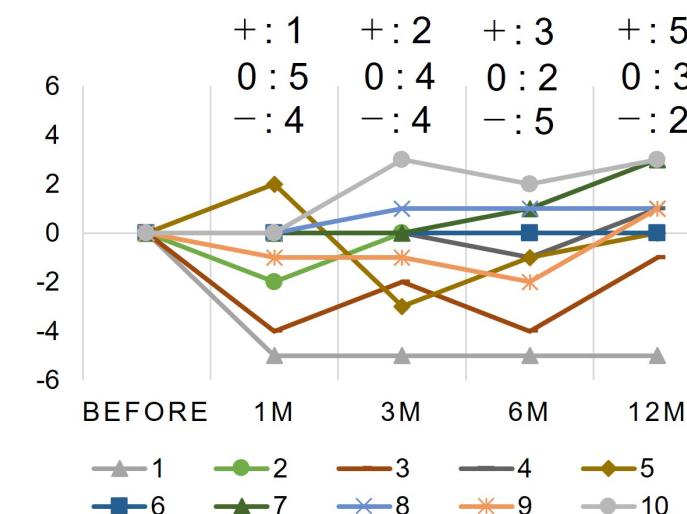
3: tongue dorsum on the nontumor side



1': tongue apex on the tumor side

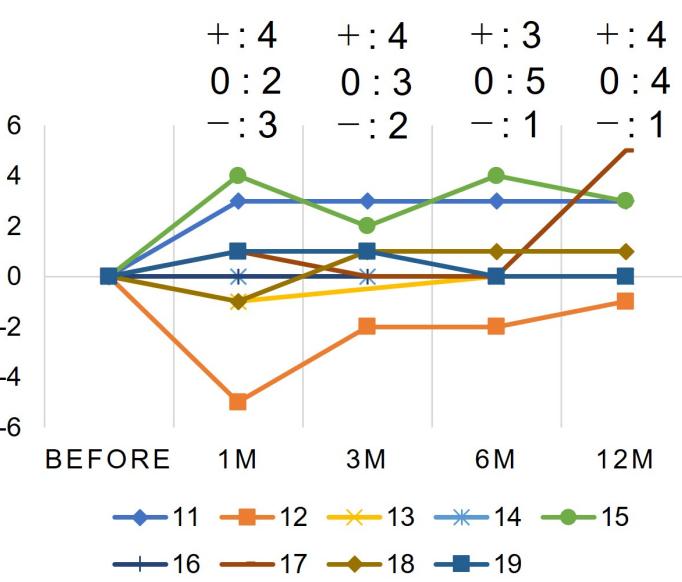


2': tongue margin on the tumor side

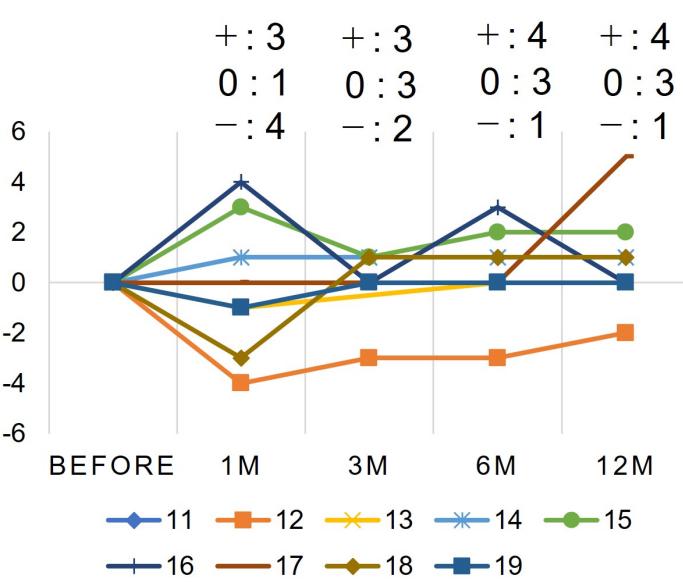


3': tongue dorsum on the tumor side

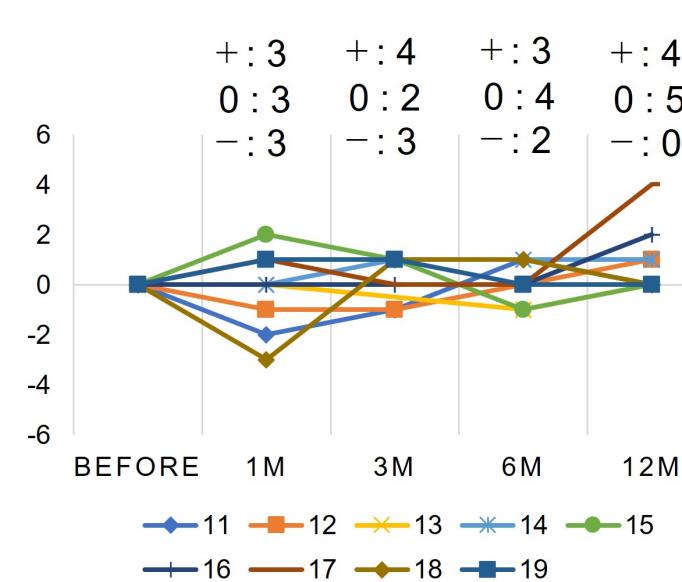
**FIGURE 4** Changes in tongue perception scores in the closure group over time



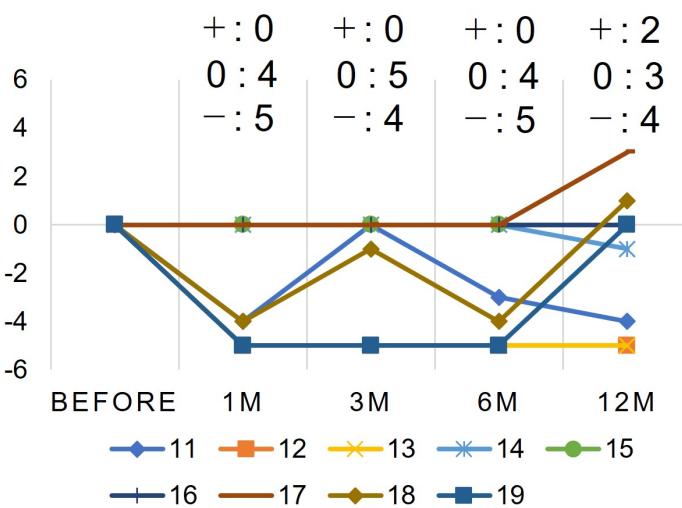
1: tongue apex on the nontumor side



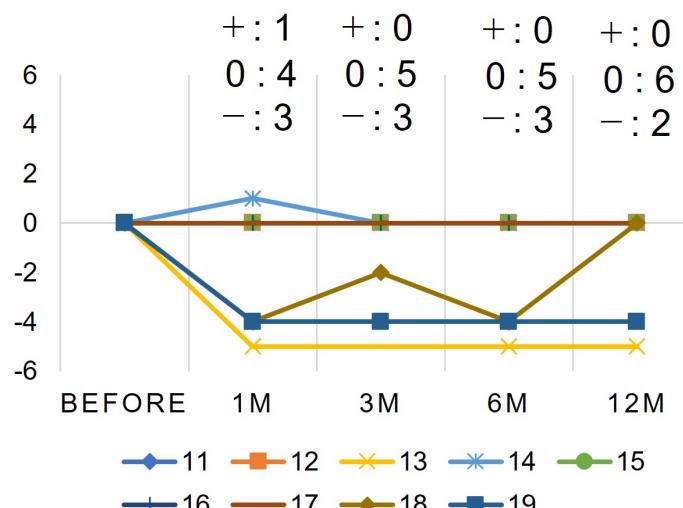
2: tongue margin on the nontumor side



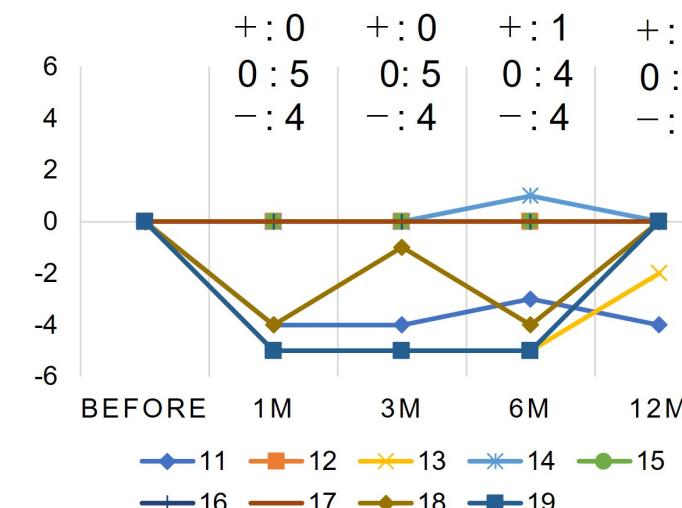
3: tongue dorsum on the nontumor side



1': tongue apex on the tumor side

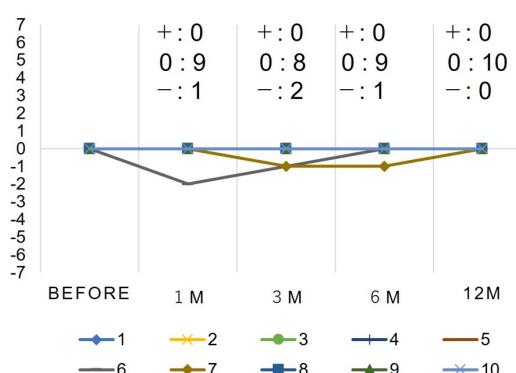


2': tongue margin on the tumor side

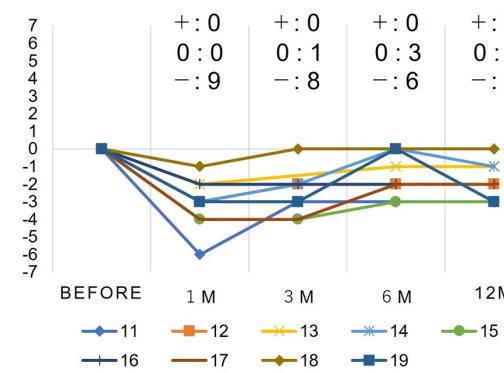


3': tongue dorsum on the tumor side

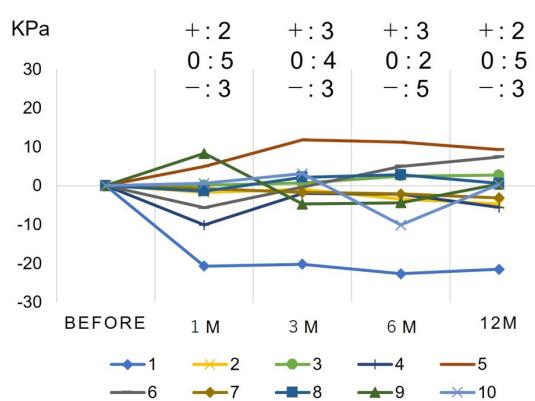
**FIGURE 5** Changes in tongue perception scores in the flap group over time



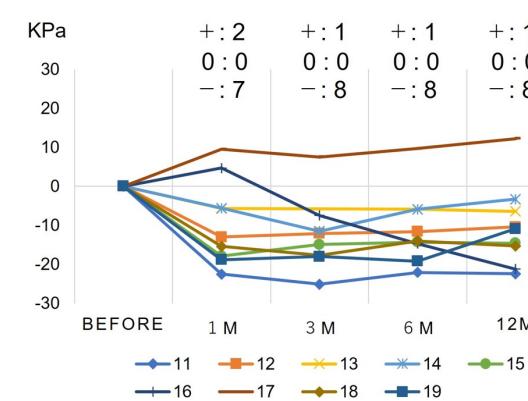
a: Tongue movement in the closure group



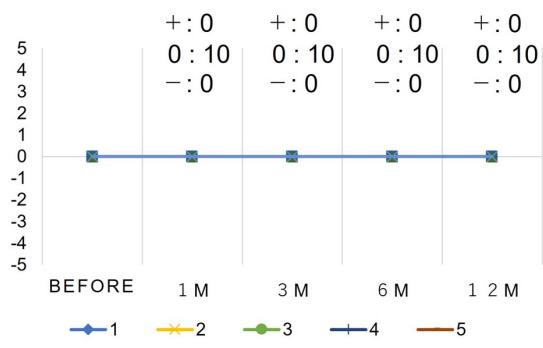
a': Tongue movement in the flap group



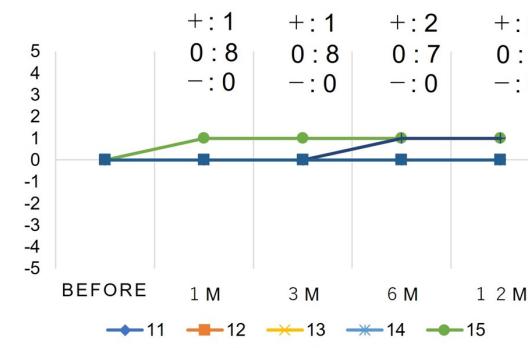
b: Tongue pressure in the closure group



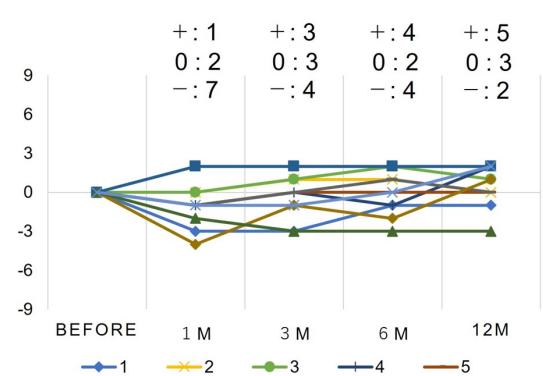
b': Tongue pressure in the flap group



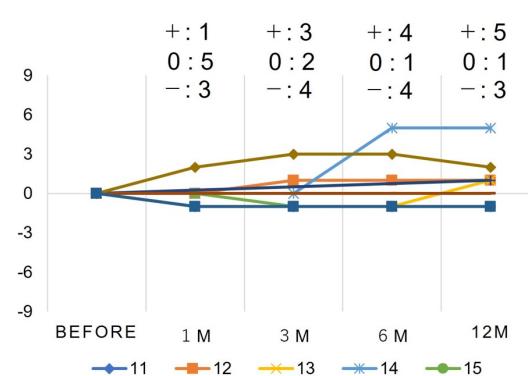
c: Water swallowing test in the closure group



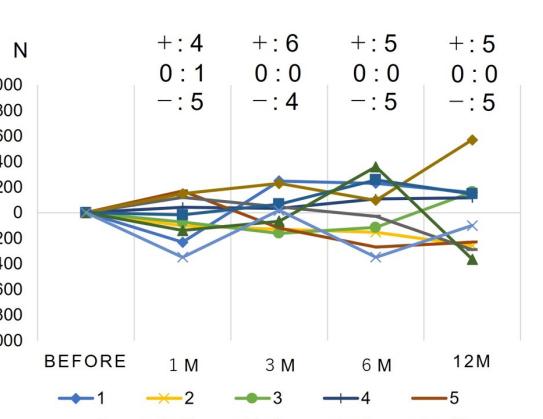
c': Water swallowing test in the flap group



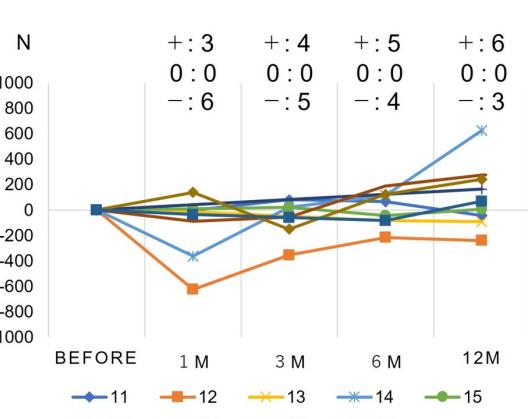
d: Chewing strength in the closure group



d': Chewing strength in the flap group



e: Bite strength in the closure group



e': Bite strength in the flap group

**FIGURE 6** Changes in oral and maxillofacial functions over time