

Clinical Paper  
Reconstructive Surgery

# Standard morphology of the oral commissure and changes resulting from reconstruction for defects involving the commissure

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**Abstract.** The aim of this study was to characterize the standard morphology of the oral commissure and to describe the changes after reconstruction in patients with through-and-through cheek defects involving the oral commissure. Indices for the morphological analyses of the commissure were derived from examinations of 50 normal Japanese volunteers. Ten patients with full-thickness cheek defects involving the commissure were then evaluated. All of these patients underwent free flap reconstruction with vermilion advancement flaps from the remaining vermilion. The morphology of the commissure with the mouth closed was classified based on the point of entrance of the vermilion into the oral cavity. In normal volunteers, the commissure pattern consisting of the entrance of the upper vermilion into the oral cavity before the lower vermilion and just prior to forming the oral commissure was considered to be the standard. However, in the reconstructed cases, there was an increase in the pattern in which the lower vermilion enters the oral cavity before the upper vermilion for the remaining commissure postoperatively, especially when the lower lip defects were greater than those of the upper lip. It is important to refer not only to the standard morphology of the commissure, but also to the changes according to the extent of resection and the method of reconstruction.

**Key words:** free flap; reconstruction; commissure; anatomy; lip; morphology; cheek; vermilion flap.

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Cancer ablation may result in through-and-through cheek defects involving both lips and the oral commissure. It is challenging to achieve both a functional and an aesthetic

reconstruction. In particular, the aesthetic restoration of the oral commissure is one of the most difficult challenges in reconstructive surgery. What exactly are the ‘normal’

morphology and the ‘standard’ external anatomy of the oral commissure? How does the remaining oral commissure change after reconstructive surgery?

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For patients exhibiting massive defects involving the cheek, oral commissure, and vermilion, reconstruction with the use of various vascularized free flaps<sup>1-16</sup> and remaining vermilion advancement flaps<sup>1,2,17</sup> has been reported.

This study aimed to characterize the standard external anatomy of the oral commissure and to describe the changes in external anatomy after free flap reconstruction combined with vermilion advancement flaps, in patients with through-and-through cheek defects involving both lips and the oral commissure. It was also sought to establish a

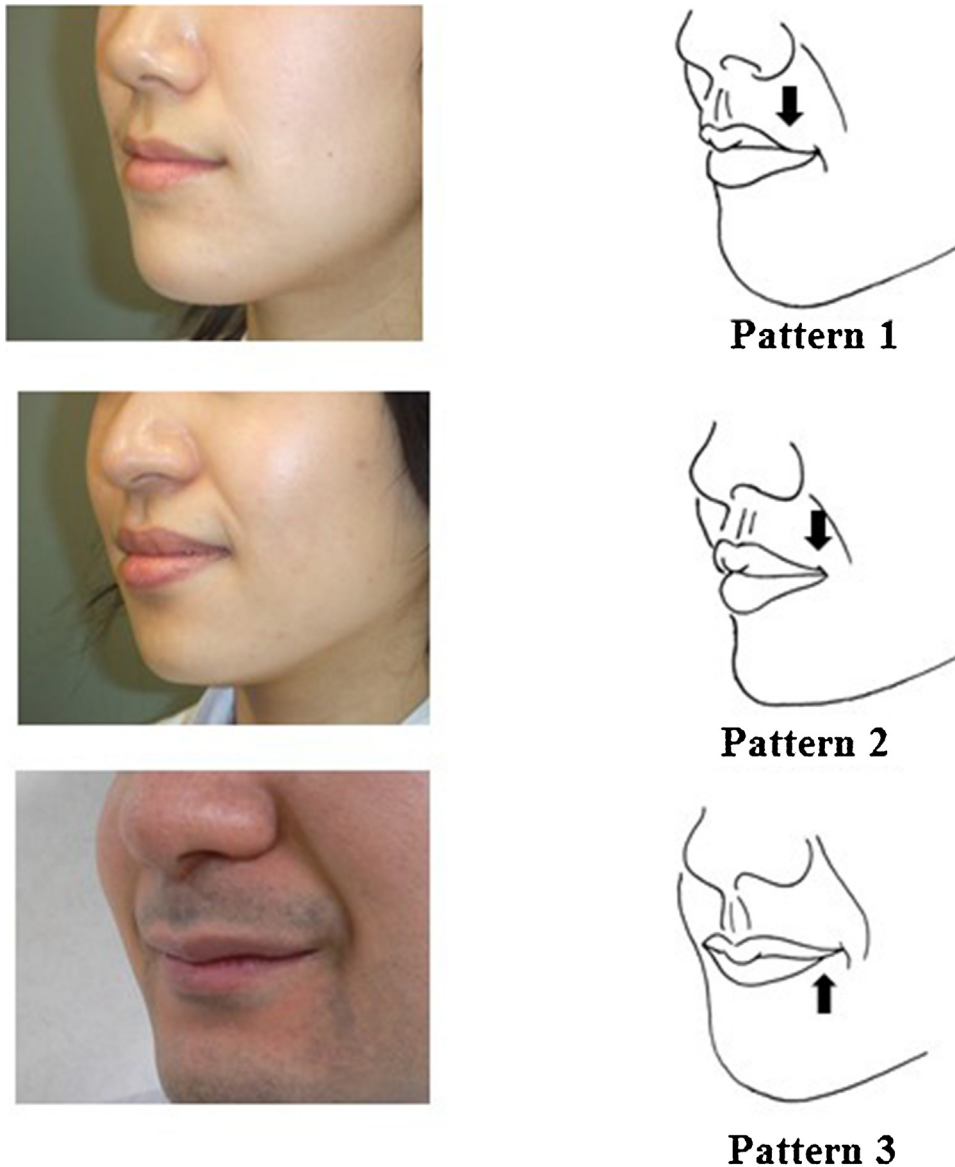
procedure based on these anatomical criteria.

### Subjects and methods

The indices for the morphological features of the external anatomy of the oral commissure were derived from the records of 50 Japanese male and female volunteers aged between 20 and 40 years. The oral commissure was photographed with the mouth closed. The subjects were asked to relax the oral sphincter with the mouth closed. This position was selected because the Japanese often communicate with the mouth closed to slightly open during daily

activities and rarely open the mouth to its full extent, as when yawning. As the mouth closes, both the upper and lower vermilion twist slightly towards the oral cavity. The morphology of the oral commissure with the mouth closed was classified into three patterns based on the position at which the vermilion enters the oral cavity (Fig. 1).

Ten patients with oral commissure and vermilion defects associated with full-thickness cheek defects after cancer resection were evaluated before and after surgery. In all cases, the reconstructions were performed with free flaps and advancement flaps from the remaining vermilion.



*Fig. 1.* Morphology of the oral commissure with the mouth closed derived from 50 Japanese volunteers. The morphology was classified into three patterns based on the position at which the vermilion enters the oral cavity. In pattern 1, the upper vermilion enters the oral cavity before the lower vermilion and just prior to forming the oral commissure. The lower vermilion comes into contact with the white upper lip (skin portion). In pattern 2, the upper vermilion and lower vermilion enter the oral cavity concurrently. In pattern 3 (the complete opposite of pattern 1), the lower vermilion enters the oral cavity before the upper vermilion.

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