

## Facial angiology considerations during minimally invasive procedures

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In minimally invasive anti-aging treatment, the facial artery course and distribution area are very important factors to prevent side effects from intravascular injection. Although it is possible to confirm the course and size of patient's facial artery using imaging device such as ultrasound, it is difficult to determine the course and distribution of the facial artery during the treatment. The detailed knowledge for the facial artery is possible to enable the rapid prediction of the course and distribution pattern of facial artery in the pre-procedure stage by analyzing the differences in the course and distribution pattern of the facial artery in the face depending on the diameter of the main trunk, thereby minimize the risk of damage and intravascular injection to the facial artery. The facial artery (FA) was classified into 5 types. The typical type (type IV) of facial artery was only 11.5% of all cases. Most common type of FA was type III (65.4%), which was absent angular artery (AA). In 9.6% of cases, the FA had a abnormal large branch, called detoured branch (DT). The type I (7.7%) had only the inferior labial (ILA) and the type II (5.8%) had the ILA and the superior labial artery (SLA). The average diameter of main trunk of FA at the antegonial notch was  $3.0 \pm 0.68$ mm (range 1.85-4.68). The diameter of main trunk of type I was the smallest ( $1.99 \pm 0.11$ mm) and the type IV was the largest ( $3.91 \pm 0.44$ mm). As a result of statistical correlation analysis, it was found that as the diameter of the main trunk of FA increased, the distribution area of FA on the face and the number of branches of FA increased. And the probability of the presence of DT was also increased. In addition, when DT was present, the probability that AA was located in the superficial layer than facial expression muscles also increased. We confirmed that the diameter of main trunk of FA had a very close positive correlation with the area of FA distribution on the face and the number of branches from FA. In particular, when the diameter of the FA is 4 mm or more, the probability of the presence of DT and the probability that the AA is located shallower than the facial expression muscles are increased. And also, we confirmed the facial artery has asymmetry in many cases and the right side of FA was dominant than left side.