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**ASSESSMENT OF PATENCY OF ULNAR ARTERY AND COLLATERAL
CIRCULATION TO THE HAND FOR RECONSTRUCTION WITH RADIAL FREE
FOREARM FLAP IN ORAL SQUAMOUS CELL CARCINOMA: A COMPARATIVE
STUDY OF ALLEN'S TEST, MODIFIED ALLEN'S AND PULSE OXIMETRY TO
COLOUR DOPPLER ULTRASOUND (SNUFFBOX TECHNIQUE)**

By

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ABSTRACT

Background: The radial forearm flap is best known for its versatility, pliability and vasculature making it the flap of choice for orofacial defects. However, it ensures the removal of one of the principal arteries supplying the hand. Sound knowledge of the collateral circulation of the hand preoperatively is mandatory to prevent a rare, but a grave complication of hand ischemia

Objectives: To evaluate the collateral circulation of the hand on radial artery compression using 4 non-invasive methods.

Methods: Prospective, experimental analysis of 4 non-invasive tests were conducted on 36 patients (71 hands) indicated for radial forearm flap reconstruction, to assess their collateral circulation after radial artery compression using Allen's test, Modified Allen's test, Pulse oximeter and colour Doppler ultrasound as the gold standard. Diagnostic parameters (Sensitivity, Specificity, negative predictive value and positive values) were calculated for Allen's test, modified Allen's test and pulse oximetry with colour doppler ultrasound as the gold standard.

Results: Allen's test and Modified Allen's test had only 35.29% sensitivity in predicting abnormality whereas Pulse oximetry has 76.47% sensitivity. Allen's test and modified Allen's test scored 100% specificity whereas pulse oximetry scored 98.15% specificity. The diagnostic accuracy of Allen's test and Modified Allen's test was 84.5% (95% CI) and 92.96% (95% CI) for pulse oximetry respectively.

Interpretation: In the evaluation of collateral circulation of the palm, Allen's test and Modified Allen's test showed false-negative results with low sensitivity while Pulse oximetry showed a high correlation to Doppler ultrasound.

Conclusion: Allen's and Modified Allen's test being subjective with a high incidence of false results should not be in consideration for a reliable preoperative test for collateral circulation assessment. However, Pulse oximetry has been demonstrated to be more expedient than the other tests when compared to the gold standard.

KEYWORDS: radial free forearm flap; collateral hand circulation; Allen's test; Modified Allen's test; pulse oximetry; Doppler ultrasound
